



June 9, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Gross Ile, Michigan 48138-1692

**Subject: Data Validation Report
Grand Rapids Vapor Intrusion Emergency Response
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0794**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for two air samples collected at the Grand Rapids Vapor Intrusion Emergency Response site. The samples were collected on May 21, 2016 and were analyzed for volatile organic compounds (VOC) by the Bureau Veritas Laboratory in Novi, Michigan. The laboratory data package was received on May 31, 2016.

Analytical data were evaluated in general accordance with the EPA *Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

All results may be used as reported.

If you have any questions regarding this data validation report, please call me at (312) 201-7756

Sincerely,

A handwritten signature in black ink that reads 'Harry N. Ellis III'.

Harry Ellis
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Seagull Envirotech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
AIR SAMPLES COLLECTED MAY 21, 2016**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids Vapor Intrusion ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0794	Technical Reviewer (signature and date)	<i>Debbie Kuhl</i> June 9, 2016
Data Reviewer (signature and date)	<i>Harry N. Ellis III</i> 1 June 2016	Laboratory	Bureau Veritas/Novi, Michigan
Laboratory Report No.	16051298		
Analyses	Volatile organic compounds (VOC) by EPA Method TO-15		
Samples and Matrix	Two air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

All results may be used as reported.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-01-IA- [REDACTED] 1)

Date Sampled: 5/21/2016

Lab Number: 001A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -5.2 psig

Final Pressure: -0.6 psig

Canister ID: N0033

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	4.1	ND	0.75	1.5	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.1	ND	0.75	1.5	
79-00-5	1,1,2-Trichloroethane	ND	4.1	ND	0.75	1.5	
75-34-3	1,1-Dichloroethane	ND	3.0	ND	0.75	1.5	
75-35-4	1,1-Dichloroethene	ND	3.0	ND	0.75	1.5	
120-82-1	1,2,4-Trichlorobenzene	ND	5.6	ND	0.75	1.5	
95-63-6	1,2,4-Trimethylbenzene	ND	3.7	ND	0.75	1.5	
106-93-4	1,2-Dibromoethane	ND	5.8	ND	0.75	1.5	
95-50-1	1,2-Dichlorobenzene	ND	4.5	ND	0.75	1.5	
107-06-2	1,2-Dichloroethane	ND	3.0	ND	0.75	1.5	
78-87-5	1,2-Dichloropropane	ND	3.5	ND	0.75	1.5	
108-67-8	1,3,5-Trimethylbenzene	ND	3.7	ND	0.75	1.5	
106-99-0	1,3-Butadiene	ND	1.7	ND	0.75	1.5	
541-73-1	1,3-Dichlorobenzene	ND	4.5	ND	0.75	1.5	
106-46-7	1,4-Dichlorobenzene	ND	4.5	ND	0.75	1.5	
123-91-1	1,4-Dioxane	ND	11	ND	3	1.5	
540-84-1	2,2,4-Trimethylpentane	ND	3.5	ND	0.75	1.5	
78-93-3	2-Butanone	5.6	2.2	1.9	0.75	1.5	
591-78-6	2-Hexanone	ND	3.1	ND	0.75	1.5	
622-96-8	4-Ethyltoluene	ND	3.7	ND	0.75	1.5	
108-10-1	4-Methyl-2-pentanone	ND	3.1	ND	0.75	1.5	
67-64-1	Acetone	61	3.6	26	1.5	1.5	
107-05-1	Allyl Chloride	ND	2.3	ND	0.75	1.5	
71-43-2	Benzene	ND	2.4	ND	0.75	1.5	
100-44-7	Benzyl Chloride	ND	3.9	ND	0.75	1.5	
75-27-4	Bromodichloromethane	ND	5.0	ND	0.75	1.5	
593-60-2	Bromoethene	ND	3.3	ND	0.75	1.5	
75-25-2	Bromoform	ND	7.8	ND	0.75	1.5	

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r

- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

HUG 1 June 2016



ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-01-IA [REDACTED] (1)

Date Sampled: 5/21/2016

Lab Number: 001A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -5.2 psig

Final Pressure: -0.6 psig

Canister ID: N0033

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	2.9	ND	0.75	1.5	
75-15-0	Carbon Disulfide	ND	2.3	ND	0.75	1.5	
56-23-5	Carbon Tetrachloride	ND	4.7	ND	0.75	1.5	
108-90-7	Chlorobenzene	ND	3.5	ND	0.75	1.5	
75-00-3	Chloroethane	ND	2.0	ND	0.75	1.5	
67-66-3	Chloroform	6.4	3.7	1.3	0.75	1.5	
74-87-3	Chloromethane	1.8	1.5	0.87	0.75	1.5	
156-59-2	cis-1,2-Dichloroethene	ND	3.0	ND	0.75	1.5	
10061-01-5	cis-1,3-Dichloropropene	ND	3.4	ND	0.75	1.5	
110-82-7	Cyclohexane	ND	2.6	ND	0.75	1.5	
124-48-1	Dibromochloromethane	ND	6.4	ND	0.75	1.5	
75-71-8	Dichlorodifluoromethane	ND	3.7	ND	0.75	1.5	
76-14-2	Dichlorotetrafluoroethane	ND	5.2	ND	0.75	1.5	
141-78-6	Ethyl Acetate	ND	2.7	ND	0.75	1.5	
100-41-4	Ethylbenzene	ND	3.3	ND	0.75	1.5	
142-82-5	Heptane	ND	3.1	ND	0.75	1.5	
87-68-3	Hexachlorobutadiene	ND	8.0	ND	0.75	1.5	
110-54-3	Hexane	ND	2.6	ND	0.75	1.5	
67-63-0	Isopropyl Alcohol	800	37	330	15	15	
108-38-3	m & p-Xylene	ND	3.3	ND	0.75	1.5	
1634-04-4	Methyl tert-Butyl Ether	ND	2.7	ND	0.75	1.5	
75-09-2	Methylene Chloride	ND	2.6	ND	0.75	1.5	
91-20-3	Naphthalene	ND	3.9	ND	0.75	1.5	
95-47-6	o-Xylene	ND	3.3	ND	0.75	1.5	
115-07-1	Propene	ND	1.3	ND	0.75	1.5	
100-42-5	Styrene	ND	3.2	ND	0.75	1.5	
127-18-4	Tetrachloroethene	35	5.1	5.1	0.75	1.5	
109-99-9	Tetrahydrofuran	ND	2.2	ND	0.75	1.5	

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

HUG (Junk)



ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-01-IA-XXXXXXXXXX1)

Date Sampled: 5/21/2016

Lab Number: 001A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -5.2 psig

Final Pressure: -0.6 psig

Canister ID: N0033

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	8.5	2.8	2.3	0.75	1.5	
156-60-5	trans-1,2-Dichloroethene	ND	3.0	ND	0.75	1.5	
10061-02-6	trans-1,3-Dichloropropene	ND	3.4	ND	0.75	1.5	
79-01-6	Trichloroethene	ND	4.0	ND	0.75	1.5	
75-69-4	Trichlorofluoromethane	ND	4.2	ND	0.75	1.5	
76-13-1	Trichlorotrifluoroethane	ND	5.7	ND	0.75	1.5	
108-05-4	Vinyl Acetate	ND	2.6	ND	0.75	1.5	
75-01-4	Vinyl Chloride	ND	1.9	ND	0.75	1.5	

HVG
1 Jun 16

General Notes and Qualifiers:

–; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-02-IA [REDACTED] 2)

Date Sampled: 5/21/2016

Lab Number: 002A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.69 psig

Final Pressure: -3.69 psig

Canister ID: 33954

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	
106-46-7	1,4-Dichlorobenzene	ND	3.0	ND	0.5	1	
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	
78-93-3	2-Butanone	4.8	1.5	1.6	0.5	1	
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	
67-64-1	Acetone	53	2.4	22	1	1	
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	
71-43-2	Benzene	ND	1.6	ND	0.5	1	
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	
75-25-2	Bromoform	ND	5.2	ND	0.5	1	

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

HVE 1 Jun 16



ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-02-IA [REDACTED] (2)

Date Sampled: 5/21/2016

Lab Number: 002A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.69 psig

Final Pressure: -3.69 psig

Canister ID: 33954

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	
75-15-0	Carbon Disulfide	3.6	1.6	1.2	0.5	1	
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	
67-66-3	Chloroform	3.8	2.4	0.77	0.5	1	
74-87-3	Chloromethane	1.8	1.0	0.89	0.5	1	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	
141-78-6	Ethyl Acetate	2.3	1.8	0.65	0.5	1	
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	
142-82-5	Heptane	ND	2.0	ND	0.5	1	
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	
110-54-3	Hexane	ND	1.8	ND	0.5	1	
67-63-0	Isopropyl Alcohol	47	2.5	19	1	1	
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	
75-09-2	Methylene Chloride	4.3	1.7	1.3	0.5	1	
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	
115-07-1	Propene	ND	0.86	ND	0.5	1	
100-42-5	Styrene	ND	2.1	ND	0.5	1	
127-18-4	Tetrachloroethene	67	3.4	9.9	0.5	1	
109-99-9	Tetrahydrofuran	ND	1.5	ND	0.5	1	

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r

- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

(TUG) 1 Jun 16



ANALYTICAL RESULTS

Date: 23-May-16

Client: TETRA TECH

Project:

Work Order No: 16051298

Sample Identification GRPCE-02-IA- [REDACTED] (2)

Date Sampled: 5/21/2016

Lab Number: 002A

Date Received: 5/22/2016

Sample Type: Air, Can

Analysis Date: 5/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.69 psig

Final Pressure: -3.69 psig

Canister ID: 33954

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	4.0	1.9	1.1	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

HOE
1 Jun 16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
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B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



June 16, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0858**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 45 air samples (including three field duplicates) collected at the Grand Rapids VI ER site. The samples were collected from May 26 through June 6, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the last of the data on June 14, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set, although some results were qualified as estimated. The data is usable as qualified.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

DATA VALIDATION REPORTS

SDGS 16051545, 16051635, 16060144, 16060309, AND 16060334

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0858A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16051545	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	The laboratory erroneously named the indoor air samples with "1A" instead of "IA" and the outdoor air sample with "0A" instead of "OA" in the sample identifiers. The sample names were manually corrected in the attachment.

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
N	The relative standard deviation for 1,2,4-trichlorobenzene exceeded the acceptance criteria. The associated results were qualified as estimated (J/UJ).

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent difference for 1,1-dichloroethane exceeded the acceptance criteria. The associated non-detect results were qualified as estimated (UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
N	<p>Sample GRPCE-01-IA-██████ (MAIN) required a 25-fold dilution for acetone and isopropyl alcohol to attempt to bring the results within the calibration range. The isopropyl alcohol result was still above the calibration range and was therefore qualified as estimated (J).</p> <p>Samples GRPCE-01-IA-██████ (BASEMENT), GRPCE-01-IA-██████ (BASEMENT), and GRPCE-01-IA-██████ (MAIN) required 25-fold dilutions for 1,4-dichlorobenzene, acetone, and isopropyl alcohol to attempt to bring the results within the calibration range. The isopropyl alcohol results were still above the calibration range and were therefore qualified as estimated (J).</p> <p>Sample GRPCE-01-IA-██████ (BASEMENT) required a 25-fold dilution for acetone to bring the result within the calibration range.</p>

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Note: There is no indication that results below the reporting limits, but above method detection limits, were reported.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-~~1A~~-XXXXXXXXXX

Date Sampled: 5/25/2016

Lab Number: 001A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.3 psig

Final Pressure: -1.3 psig

Canister ID: 14110

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	U
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	U
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	U
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	U
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	U
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	U
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	U
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	U
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	U
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	U
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	U
106-46-7	1,4-Dichlorobenzene	ND	3.0	ND	0.5	1	U
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	U
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	U
78-93-3	2-Butanone	2.3	1.5	0.78	0.5	1	U
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	U
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	U
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	U
67-64-1	Acetone	21	2.4	9.0	0.5	1	U
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	U
71-43-2	Benzene	ND	1.6	ND	0.5	1	U
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	U
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	U
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	U
75-25-2	Bromoform	ND	5.2	ND	0.5	1	U

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r

- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-~~9A~~ XXXXXXXXXX

Date Sampled: 5/25/2016

Lab Number: 001A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.3 psig

Final Pressure: -1.3 psig

Canister ID: 14110

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	2.6	1.6	0.85	0.5	1	
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	
67-66-3	Chloroform	ND	2.4	ND	0.5	1	↓
74-87-3	Chloromethane	1.5	1.0	0.75	0.5	1	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	
141-78-6	Ethyl Acetate	ND	1.8	ND	0.5	1	
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	
142-82-5	Heptane	ND	2.0	ND	0.5	1	
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	
110-54-3	Hexane	ND	1.8	ND	0.5	1	↓
67-63-0	Isopropyl Alcohol	8.9	2.5	3.6	1	1	
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	2.8	1.7	0.82	0.5	1	
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	
115-07-1	Propene	ND	0.86	ND	0.5	1	
100-42-5	Styrene	ND	2.1	ND	0.5	1	↓
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	
109-99-9	Tetrahydrofuran	1.9	1.5	0.65	0.5	1	

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-~~JA~~ [redacted]

Date Sampled: 5/25/2016

Lab Number: 001A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.3 psig

Final Pressure: -1.3 psig

Canister ID: 14110

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	2.2	1.9	0.59	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	↓
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project: T

Work Order No: 16051545

Sample Identification GRPCE-01-1A-XXXXXXXXXX (BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 005A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.3 psig

Final Pressure: -2.3 psig

Canister ID: 14593

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	U
79-34-5	1,1,1,2-Tetrachloroethane	ND	3.4	ND	0.5	1	U
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	U
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	U
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	U
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	U
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-93-4	1,2-Dibromochthane	ND	3.8	ND	0.5	1	U
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	U
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	U
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	U
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	U
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	U
106-46-7	1,4-Dichlorobenzene	940	78	160	13	25	U
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	U
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	U
78-93-3	2-Butanone	12	1.5	4.2	0.5	1	U
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	U
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	U
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	U
67-64-1	Acetone	320	59	130	25	25	U
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	U
71-43-2	Benzene	ND	1.6	ND	0.5	1	U
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	U
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	U
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	U
75-25-2	Bromoform	ND	5.2	ND	0.5	1	U

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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BUREAU VERITAS

ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A- (redacted) BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 005A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.3 psig

Final Pressure: -2.3 psig

Canister ID: 14593

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	ND	1.6	ND	0.5	1	U
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	U
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	U
67-66-3	Chloroform	ND	2.4	ND	0.5	1	U
74-87-3	Chloromethane	1.7	1.0	0.80	0.5	1	U
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	U
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	U
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	U
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	U
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	U
141-78-6	Ethyl Acetate	ND	1.8	ND	0.5	1	U
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	ND	2.0	ND	0.5	1	U
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	U
110-54-3	Hexane	ND	1.8	ND	0.5	1	U
67-63-0	Isopropyl Alcohol	2,800	61	1,100	25	25	U
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	ND	1.7	ND	0.5	1	U
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	U
115-07-1	Propene	ND	0.86	ND	0.5	1	U
100-42-5	Styrene	ND	2.1	ND	0.5	1	U
127-18-4	Tetrachloroethene	12	3.4	1.8	0.5	1	U
109-99-9	Tetrahydrofuran	23	1.5	7.8	0.5	1	U

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A- (BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 005A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.3 psig

Final Pressure: -2.3 psig

Canister ID: 14593

CAS #	Analyte	Results (ug/m³)	RL (ug/m³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	5.4	1.9	1.4	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	↓
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A (MAIN)

Date Sampled: 5/25/2016

Lab Number: 002A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 13957

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	U
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	U
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	U
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	U
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	U
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	U
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	U
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	U
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	U
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	U
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	U
106-46-7	1,4-Dichlorobenzene	110	3.0	18	0.5	1	U
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	U
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	U
78-93-3	2-Butanone	4.9	1.5	17	0.5	1	U
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	U
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	U
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	U
67-64-1	Acetone	140	59	61	25	25	U
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	U
71-43-2	Benzene	ND	1.6	ND	0.5	1	U
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	U
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	U
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	U
75-25-2	Bromoform	ND	5.2	ND	0.5	1	U

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

gaw
 06/14/16



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A-XXXXXXXXXX (MAIN)

Date Sampled: 5/25/2016

Lab Number: 002A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 13957

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	ND	1.6	ND	0.5	1	U
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	U
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	U
67-66-3	Chloroform	ND	2.4	ND	0.5	1	U
74-87-3	Chloromethane	1.9	1.0	0.92	0.5	1	U
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	U
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	U
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	U
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	U
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	U
141-78-6	Ethyl Acetate	6.4	1.8	1.8	0.5	1	U
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	ND	2.0	ND	0.5	1	U
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	U
110-54-3	Hexane	3.0	1.8	0.85	0.5	1	U
67-63-0	Isopropyl Alcohol	21,000	61	8,700	25	25	U J
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	10	1.7	3.0	0.5	1	U
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	U
115-07-1	Propene	ND	0.86	ND	0.5	1	U
100-42-5	Styrene	ND	2.1	ND	0.5	1	U
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	U
109-99-9	Tetrahydrofuran	1.6	1.5	0.55	0.5	1	U

General Notes and Qualifiers:

—: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

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 06/14/16



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-7A-[REDACTED] (MAIN)

Date Sampled: 5/25/2016

Lab Number: 002A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 13957

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	6.2	1.9	17	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A- [redacted] (BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 004A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.7 psig

Final Pressure: -0.7 psig

Canister ID: 14057

CAS #	Analyte	Results (ug/m³)	RL (ug/m³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	U
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	U
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	U
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	U
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	U
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	U
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	U
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	U
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	U
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	U
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	U
106-46-7	1,4-Dichlorobenzene	1,000	78	170	13	25	U
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	U
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	U
78-93-3	2-Butanone	26	1.5	8.7	0.5	1	U
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	U
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	U
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	U
67-64-1	Acetone	360	59	150	25	25	U
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	U
71-43-2	Benzene	ND	1.6	ND	0.5	1	U
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	U
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	U
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	U
75-25-2	Bromoform	ND	5.2	ND	0.5	1	U

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A (BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 004A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.7 psig

Final Pressure: -0.7 psig

Canister ID: 14057

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	ND	1.6	ND	0.5	1	U
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	U
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	U
67-66-3	Chloroform	ND	2.4	ND	0.5	1	U
74-87-3	Chloromethane	1.6	1.0	0.77	0.5	1	U
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	U
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	U
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	U
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	U
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	U
141-78-6	Ethyl Acetate	ND	1.8	ND	0.5	1	U
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	ND	2.0	ND	0.5	1	U
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	U
110-54-3	Hexane	ND	1.8	ND	0.5	1	U
67-63-0	Isopropyl Alcohol	2,400	61	1,000	25	25	U JS
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	ND	1.7	ND	0.5	1	U
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	U
115-07-1	Propene	ND	0.86	ND	0.5	1	U
100-42-5	Styrene	ND	2.1	ND	0.5	1	U
127-18-4	Tetrachloroethene	15	3.4	2.2	0.5	1	U
109-99-9	Tetrahydrofuran	50	1.5	17	0.5	1	U

General Notes and Qualifiers: --; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A (BASEMENT)

Date Sampled: 5/25/2016

Lab Number: 004A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.7 psig

Final Pressure: -0.7 psig

Canister ID: 14057

CAS #	Analyte	Results (ug/m³)	RL (ug/m³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	5.5	1.9	1.5	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	J
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-7A [REDACTED] (MAIN)

Date Sampled: 5/25/2016

Lab Number: 003A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.2 psig

Final Pressure: -1.2 psig

Canister ID: 14114

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	0
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	0
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	0
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	0
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	0
120-82-1	1,2,4-Trichlorobenzene	6.5	3.7	0.87	0.5	1	0
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	0
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	0
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	0
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	0
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	0
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	0
106-99-0	1,3-Butadiene	ND	1.1	ND	0.5	1	0
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	0
106-46-7	1,4-Dichlorobenzene	310	78	52	13	25	0
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	0
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	0
78-93-3	2-Butanone	7.0	1.5	2.4	0.5	1	0
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	0
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	0
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	0
67-64-1	Acetone	160	59	69	25	25	0
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	0
71-43-2	Benzene	ND	1.6	ND	0.5	1	0
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	0
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	0
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	0
75-25-2	Bromoform	ND	5.2	ND	0.5	1	0

General Notes and Qualifiers: --, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-A- (MAIN)

Date Sampled: 5/25/2016

Lab Number: 003A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.2 psig

Final Pressure: -1.2 psig

Canister ID: 14114

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	1.9	1.6	0.60	0.5	1	
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	J
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	
67-66-3	Chloroform	ND	2.4	ND	0.5	1	J
74-87-3	Chloromethane	1.9	1.0	0.92	0.5	1	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	J
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	J
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	J
141-78-6	Ethyl Acetate	3.5	1.8	0.98	0.5	1	
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	ND	2.0	ND	0.5	1	J
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	
110-54-3	Hexane	1.9	1.8	0.54	0.5	1	
67-63-0	Isopropyl Alcohol	3,300	61	1,300	25	25	J
108-38-3	m & p-Xylene	ND	2.2	ND	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	
75-09-2	Methylene Chloride	ND	1.7	ND	0.5	1	
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	
115-07-1	Propene	ND	0.86	ND	0.5	1	
100-42-5	Styrene	ND	2.1	ND	0.5	1	J
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	
109-99-9	Tetrahydrofuran	4.5	1.5	1.5	0.5	1	

General Notes and Qualifiers:

-: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-A (MAIN)

Date Sampled: 5/25/2016

Lab Number: 003A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.2 psig

Final Pressure: -1.2 psig

Canister ID: 14114

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	8.0	1.9	2.1	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-1A-1156 (BASEMENT)

Date Sampled: 5/26/2016

Lab Number: 006A I

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.4 psig

Final Pressure: -1.4 psig

Canister ID: 14201

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	0
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	0
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	0
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	0
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	0
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	0
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	0
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	0
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	0
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	0
78-87-5	1,2-Dichloropropane	ND	2.3	ND	0.5	1	0
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	0
106-99-0	1,3-Butadiene	2.3	1.1	1.0	0.5	1	0
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	0
106-46-7	1,4-Dichlorobenzene	3.5	3.0	0.58	0.5	1	0
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	0
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	0
78-93-3	2-Butanone	3.6	1.5	1.2	0.5	1	0
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	0
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	0
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	0
67-64-1	Acetone	73	59	31	25	25	0
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	0
71-43-2	Benzene	2.2	1.6	0.68	0.5	1	0
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	0
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	0
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	0
75-25-2	Bromoform	ND	5.2	ND	0.5	1	0

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

jaw
 06/14/16



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-JA (BASEMENT)

Date Sampled: 5/26/2016

Lab Number: 006A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.4 psig

Final Pressure: -1.4 psig

Canister ID: 14201

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	ND	1.6	ND	0.5	1	U
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	U
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	U
67-66-3	Chloroform	6.0	2.4	1.2	0.5	1	U
74-87-3	Chloromethane	2.1	1.0	1.0	0.5	1	U
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	U
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	U
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	U
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	U
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	U
141-78-6	Ethyl Acetate	3.0	1.8	0.82	0.5	1	U
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	3.4	2.0	0.83	0.5	1	U
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	U
110-54-3	Hexane	ND	1.8	ND	0.5	1	U
67-63-0	Isopropyl Alcohol	11	2.5	4.5	1	1	U
108-38-3	m & p-Xylene	5.1	2.2	1.2	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	ND	1.7	ND	0.5	1	U
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	U
115-07-1	Propene	ND	0.86	ND	0.5	1	U
100-42-5	Styrene	ND	2.1	ND	0.5	1	U
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	U
109-99-9	Tetrahydrofuran	ND	1.5	ND	0.5	1	U

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-017A-XXXXXXXXXX (BASEMENT)

Date Sampled: 5/26/2016

Lab Number: 006A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.4 psig

Final Pressure: -1.4 psig

Canister ID: 14201

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	14	1.9	3.8	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	↓
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-7A-[REDACTED] (MAIN)

Date Sampled: 5/26/2016

Lab Number: 007A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 14101

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
71-55-6	1,1,1-Trichloroethane	ND	2.7	ND	0.5	1	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.4	ND	0.5	1	U
79-00-5	1,1,2-Trichloroethane	ND	2.7	ND	0.5	1	U
75-34-3	1,1-Dichloroethane	ND	2.0	ND	0.5	1	U
75-35-4	1,1-Dichloroethene	ND	2.0	ND	0.5	1	U
120-82-1	1,2,4-Trichlorobenzene	ND	3.7	ND	0.5	1	U
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-93-4	1,2-Dibromoethane	ND	3.8	ND	0.5	1	U
95-50-1	1,2-Dichlorobenzene	ND	3.0	ND	0.5	1	U
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.5	1	U
78-87-5	1,2-Dichloropropane	4.5	2.3	0.97	0.5	1	U
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ND	0.5	1	U
106-99-0	1,3-Butadiene	2.4	1.1	1.1	0.5	1	U
541-73-1	1,3-Dichlorobenzene	ND	3.0	ND	0.5	1	U
106-46-7	1,4-Dichlorobenzene	ND	3.0	ND	0.5	1	U
123-91-1	1,4-Dioxane	ND	7.2	ND	2	1	U
540-84-1	2,2,4-Trimethylpentane	ND	2.3	ND	0.5	1	U
78-93-3	2-Butanone	3.4	1.5	1.2	0.5	1	U
591-78-6	2-Hexanone	ND	2.0	ND	0.5	1	U
622-96-8	4-Ethyltoluene	ND	2.5	ND	0.5	1	U
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.5	1	U
67-64-1	Acetone	59	2.4	25	1	1	U
107-05-1	Allyl Chloride	ND	1.6	ND	0.5	1	U
71-43-2	Benzene	2.2	1.6	0.70	0.5	1	U
100-44-7	Benzyl Chloride	ND	2.6	ND	0.5	1	U
75-27-4	Bromodichloromethane	ND	3.4	ND	0.5	1	U
593-60-2	Bromoethene	ND	2.2	ND	0.5	1	U
75-25-2	Bromoform	ND	5.2	ND	0.5	1	U

General Notes and Qualifiers:
 --; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-7A (MAIN)

Date Sampled: 5/26/2016

Lab Number: 007A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 14101

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
74-83-9	Bromomethane	ND	1.9	ND	0.5	1	U
75-15-0	Carbon Disulfide	ND	1.6	ND	0.5	1	U
56-23-5	Carbon Tetrachloride	ND	3.1	ND	0.5	1	U
108-90-7	Chlorobenzene	ND	2.3	ND	0.5	1	U
75-00-3	Chloroethane	ND	1.3	ND	0.5	1	U
67-66-3	Chloroform	6.1	2.4	1.3	0.5	1	U
74-87-3	Chloromethane	ND	1.0	ND	0.5	1	U
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	U
10061-01-5	cis-1,3-Dichloropropene	ND	2.3	ND	0.5	1	U
110-82-7	Cyclohexane	ND	1.7	ND	0.5	1	U
124-48-1	Dibromochloromethane	ND	4.3	ND	0.5	1	U
75-71-8	Dichlorodifluoromethane	ND	2.5	ND	0.5	1	U
76-14-2	Dichlorotetrafluoroethane	ND	3.5	ND	0.5	1	U
141-78-6	Ethyl Acetate	3.1	1.8	0.85	0.5	1	U
100-41-4	Ethylbenzene	ND	2.2	ND	0.5	1	U
142-82-5	Heptane	2.7	2.0	0.66	0.5	1	U
87-68-3	Hexachlorobutadiene	ND	5.3	ND	0.5	1	U
110-54-3	Hexane	ND	1.8	ND	0.5	1	U
67-63-0	Isopropyl Alcohol	8.9	2.5	3.6	1	1	U
108-38-3	m & p-Xylene	5.0	2.2	1.2	0.5	1	U
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	ND	0.5	1	U
75-09-2	Methylene Chloride	ND	1.7	ND	0.5	1	U
91-20-3	Naphthalene	ND	2.6	ND	0.5	1	U
95-47-6	o-Xylene	ND	2.2	ND	0.5	1	U
115-07-1	Propene	ND	0.86	ND	0.5	1	U
100-42-5	Styrene	ND	2.1	ND	0.5	1	U
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	U
109-99-9	Tetrahydrofuran	ND	1.5	ND	0.5	1	U

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

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ANALYTICAL RESULTS

Date: 27-May-16

Client: TETRA TECH

Project:

Work Order No: 16051545

Sample Identification GRPCE-01-7A (MAIN)

Date Sampled: 5/26/2016

Lab Number: 007A

Date Received: 5/26/2016

Sample Type: Air, Can

Analysis Date: 5/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.7 psig

Final Pressure: -1.7 psig

Canister ID: 14101

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
108-88-3	Toluene	12	1.9	31	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	J
10061-02-6	trans-1,3-Dichloropropene	ND	2.3	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-69-4	Trichlorofluoromethane	ND	2.8	ND	0.5	1	
76-13-1	Trichlorotrifluoroethane	ND	3.8	ND	0.5	1	
108-05-4	Vinyl Acetate	ND	1.8	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0858B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16051635	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Fifteen air samples (including one field duplicate)		
Field Duplicate Pairs	GRPCE-03-IA-██████(2)/GRPCE-03-IA-██████(2)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent differences for cis-1,2-dichloroethene and trans-1,2-dichloroethene exceeded the acceptance criteria. The associated non-detect results were qualified as estimated (UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
N	Sample GRPCE-01-IA- [REDACTED] BASEMENT) required a 5-fold dilution for tetrachloroethene to bring the result within the calibration range.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Note: There is no indication that results below the reporting limits, but above method detection limits, were reported.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-01-IA (REDACTED) BASEMENT)

Date Sampled: 5/28/2016

Lab Number: 004A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.37 psig

Final Pressure: -1.37 psig

Canister ID: 14610

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	130	17	19	2.5	5	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	UJ

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General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-01-IA- [REDACTED] (MAIN)

Date Sampled: 5/28/2016

Lab Number: 003A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.05 psig

Final Pressure: -1.05 psig

Canister ID: 14068

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	30	3.4	4.5	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	U
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-01-IA-1 (BASEMENT)

Date Sampled: 5/28/2016

Lab Number: 001A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.7 psig

Final Pressure: -0.7 psig

Canister ID: 14121

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	130	3.4	19	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	U
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-01-IA-1 (MAIN)

Date Sampled: 5/28/2016

Lab Number: 002A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.22 psig

Final Pressure: -2.22 psig

Canister ID: 14574

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	2.0	3.4	3.0	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	UJ

gaw
06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J, Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA [REDACTED] BASEMENT)

Date Sampled: 5/30/2016

Lab Number: 009A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.36 psig

Final Pressure: -1.36 psig

Canister ID: 14125

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	110	3.4	17	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	UJ

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA- [REDACTED] (MAIN)

Date Sampled: 5/30/2016

Lab Number: 010A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.08 psig

Final Pressure: -2.08 psig

Canister ID: 14142

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	20	3.4	3.0	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	U
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA-1 (BASEMENT)

Date Sampled: 5/30/2016

Lab Number: 008A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.27 psig

Final Pressure: -1.27 psig

Canister ID: 14245

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	90	3.4	13	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA- [REDACTED]

Date Sampled: 5/30/2016

Lab Number: 011A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.25 psig

Final Pressure: -1.25 psig

Canister ID: 14079

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	18	3.4	2.6	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 j; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA-██████1)

Date Sampled: 5/28/2016

Lab Number: 005A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.61 psig

Final Pressure: -1.61 psig

Canister ID: 14120

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	34	3.4	5.1	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	UJ

DRS
06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-IA-██████2)

Date Sampled: 5/28/2016

Lab Number: 006A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.17 psig

Final Pressure: -1.17 psig

Canister ID: 14462

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	32	3.4	4.7	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-02-OA-1

Date Sampled: 5/28/2016

Lab Number: 007A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.2 psig

Final Pressure: -1.2 psig

Canister ID: 14466

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	U
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	U
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-03-IA (redacted) 1)

Date Sampled: 5/30/2016

Lab Number: 012A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.25 psig

Final Pressure: -1.25 psig

Canister ID: 13989

CAS #	Analyte	Results (ug/m³)	RL (ug/m³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	25	3.4	3.6	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	UJ
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	UJ

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-03-IA-[REDACTED]2)

Date Sampled: 5/30/2016

Lab Number: 013A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.28 psig

Final Pressure: -1.28 psig

Canister ID: 14001

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	05
127-18-4	Tetrachloroethene	37	3.4	5.4	0.5	1	05
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	05
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	05
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	05

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-03-IA-██████2)-DP

Date Sampled: 5/30/2016

Lab Number: 014A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 5/31/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.59 psig

Final Pressure: -1.59 psig

Canister ID: 14076

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
127-18-4	Tetrachloroethene	36	3.4	5.3	0.5	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	UJ
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	U
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16051635

Sample Identification GRPCE-03-OA [REDACTED]

Date Sampled: 5/30/2016

Lab Number: 015A

Date Received: 5/31/2016

Sample Type: Air, Can

Analysis Date: 6/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.47 psig

Final Pressure: -1.47 psig

Canister ID: 14478

CAS #	Analyte	Results (ug/m ³)	RL (ug/m ³)	Results (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	ND	0.5	1	SSSS
127-18-4	Tetrachloroethene	ND	3.4	ND	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	ND	0.5	1	
79-01-6	Trichloroethene	ND	2.7	ND	0.5	1	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.5	1	

gaw
06/14/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0858C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16060144	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including one field duplicate)		
Field Duplicate Pairs	GRPCE-04-IA-██████(1)/GRPCE-04-IA-██████(1)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-03-IA [REDACTED] (BASEMENT)

Date Sampled: 6/2/2016

Lab Number: 005A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.93 psig

Final Pressure: -1.93 psig

Canister ID: 14292

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	57	0.27	3.4	8.4	0.04	0.5	1	U
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	0.21	0.21	2.7	0.040	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-03-1A [REDACTED] (MAIN)

Date Sampled: 6/2/2016

Lab Number: 004A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.64 psig

Final Pressure: -2.64 psig

Canister ID: 14037

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	16	0.27	3.4	2.3	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	↓
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-03-IA [REDACTED]

Date Sampled: 6/2/2016

Lab Number: 007A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.04 psig

Final Pressure: -2.04 psig

Canister ID: 14551

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	40	0.27	3.4	5.9	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	0.21	0.21	2.7	0.040	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	U

gaw
06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-03-IA- [REDACTED]

Date Sampled: 6/2/2016

Lab Number: 006A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.48 psig

Final Pressure: -2.48 psig

Canister ID: 14619

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	18	0.27	3.4	2.6	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	↓
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-04-IA- [REDACTED] 1)

Date Sampled: 6/2/2016

Lab Number: 001A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.61 psig

Final Pressure: -1.61 psig

Canister ID: 14289

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	23	0.27	3.4	3.5	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	J

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06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-04-IA [REDACTED] 1)-DP

Date Sampled: 6/2/2016

Lab Number: 002A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.82 psig

Final Pressure: -1.82 psig

Canister ID: 14544

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	24	0.27	3.4	3.5	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	J

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-04-IA (redacted) 2)

Date Sampled: 6/2/2016

Lab Number: 003A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.02 psig

Final Pressure: -2.02 psig

Canister ID: 14614

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	22	0.27	3.4	3.3	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	↓
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060144

Sample Identification GRPCE-04-OA [REDACTED]

Date Sampled: 6/2/2016

Lab Number: 008A

Date Received: 6/2/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.52 psig

Final Pressure: -1.52 psig

Canister ID: 13994

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	ND	0.27	3.4	ND	0.04	0.5	1	↓
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	↓
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	↓
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

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06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0858D	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16060309	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Eight air samples (including one field duplicate)		
Field Duplicate Pairs	GRPCE-04-IA- [REDACTED] GRPCE-04-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-04-IA- [REDACTED] (BASEMENT)

Date Sampled: 6/3/2016

Lab Number: 004A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.09 psig

Final Pressure: -1.09 psig

Canister ID: 14291

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	69	0.27	3.4	10	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	0.32	0.21	2.7	0.060	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	U

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06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-04-IA [REDACTED] (MAIN)

Date Sampled: 6/3/2016

Lab Number: 003A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.4 psig

Final Pressure: -2.4 psig

Canister ID: 13940

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.24	0.16	2.0	0.060	0.04	0.5	1	J
127-18-4	Tetrachloroethene	12	0.27	3.4	1.7	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

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06/14/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: **TETRA TECH**

Project:

Work Order No: 16060309

Sample Identification GRPCE-04-IA [REDACTED]

Date Sampled: 6/3/2016

Lab Number: 005A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.4 psig

Final Pressure: -0.4 psig

Canister ID: 14612

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	53	0.27	3.4	7.8	0.04	0.5	1	U
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	0.27	0.21	2.7	0.050	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	U

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06/16/16

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06/14/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-04-IA- [REDACTED] DP

Date Sampled: 6/3/2016

Lab Number: 006A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.89 psig

Final Pressure: -1.89 psig

Canister ID: 13999

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	40	0.27	3.4	5.9	0.04	0.5	1	U
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	0.27	0.21	2.7	0.050	0.04	0.5	1	J
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	U

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06/14/16

gaw
06/14/16

General Notes and Qualifiers:

-, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-04-IA- [REDACTED]

Date Sampled: 6/3/2016

Lab Number: 007A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/4/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.3 psig

Final Pressure: -2.3 psig

Canister ID: 14463

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	12	0.27	3.4	1.8	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

gaw
06/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
ND; Less than the indicated limit of detection (LOD)
RL; Report Limit
J; Value is between the MDL and Reporting Limit, estimated r
MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
S; Spike Recovery outside accepted recovery limits
R; RPD outside accepted recovery limits
T; Tentatively Identified Compound (TIC)
E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-05-IA- [REDACTED] (1)

Date Sampled: 6/3/2016

Lab Number: 001A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.67 psig

Final Pressure: -1.67 psig

Canister ID: 14581

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	16	0.27	3.4	2.4	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	J

gaw
06/14/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-05-IA- [REDACTED] (2)

Date Sampled: 6/3/2016

Lab Number: 002A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.93 psig

Final Pressure: -1.93 psig

Canister ID: 14613

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	25	0.27	3.4	3.7	0.04	0.5	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	J

gaw
06/14/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060309

Sample Identification GRPCE-05-OA [REDACTED]

Date Sampled: 6/3/2016

Lab Number: 008A

Date Received: 6/3/2016

Sample Type: Air, Can

Analysis Date: 6/4/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.29 psig

Final Pressure: -3.29 psig

Canister ID: 14476

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
127-18-4	Tetrachloroethene	0.34	0.27	3.4	0.050	0.04	0.5	1	J
156-60-5	trans-1,2-Dichloroethene	ND	0.16	2.0	ND	0.04	0.5	1	U
79-01-6	Trichloroethene	ND	0.21	2.7	ND	0.04	0.5	1	
75-01-4	Vinyl Chloride	ND	0.10	1.3	ND	0.04	0.5	1	↓

gaw
06/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0858E	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16060334	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent differences for cis-1,2-dichloroethene and trans-1,2-dichloroethene exceeded the acceptance criteria. The associated results were qualified as estimated (J/UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-05-IA [REDACTED] (BASEMENT)

Date Sampled: 6/6/2016

Lab Number: 004A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.73 psig

Final Pressure: -0.73 psig

Canister ID: 14159

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RI (ug/m ³)	Results (ppbV)	MDL (ppbV)	RI (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
127-18-4	Tetrachloroethene	63	0.27	0.27	9.3	0.04	0.04	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	0.21	0.21	0.21	0.040	0.04	0.04	1	U
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	U

gaw
06/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-05-1A [REDACTED] (MAIN)

Date Sampled: 6/6/2016

Lab Number: 003A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.74 psig

Final Pressure: -0.74 psig

Canister ID: 13964

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
127-18-4	Tetrachloroethene	12	0.27	0.27	1.8	0.04	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	U
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	U

gaw
06/15/16

General Notes and Qualifiers:

--: Information not available or not applicable.

ND: Less than the indicated limit of detection (LOD)

RL: Report Limit

J: Value is between the MDL and Reporting Limit, estimated r

MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank

S: Spike Recovery outside accepted recovery limits

R: RPD outside accepted recovery limits

T: Tentatively Identified Compound (TIC)

E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-05-IA [REDACTED]

Date Sampled: 6/6/2016

Lab Number: 005A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.56 psig

Final Pressure: -1.56 psig

Canister ID: 14078

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
127-18-4	Tetrachloroethene	41	0.27	0.27	6.0	0.04	0.04	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	UJ
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	UJ

gaw
06/15/16

General Notes and Qualifiers:

–; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-05-IA-1168 (MAIN)

Date Sampled: 6/6/2016

Lab Number: 006A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.54 psig

Final Pressure: -3.54 psig

Canister ID: 13986

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.16	0.16	0.16	0.040	0.04	0.04	1	J
127-18-4	Tetrachloroethene	11	0.27	0.27	1.6	0.04	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	UJ
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	U

gaw
06/15/16

General Notes and Qualifiers:

--: Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-06-IA- [REDACTED] (1)

Date Sampled: 6/6/2016

Lab Number: 001A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.37 psig

Final Pressure: -1.37 psig

Canister ID: 14315

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
127-18-4	Tetrachloroethene	9.8	0.27	0.27	1.5	0.04	0.04	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	UJ
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	U

gaw
06/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-06IA-1170 (2)

Date Sampled: 6/6/2016

Lab Number: 002A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.18 psig

Final Pressure: -2.18 psig

Canister ID: 14026

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
127-18-4	Tetrachloroethene	35	0.27	0.27	5.1	0.04	0.04	1	UJ
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	UJ
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	UJ
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	UJ

gaw
06/15/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 07-Jun-16

Client: TETRA TECH

Project:

Work Order No: 16060334

Sample Identification GRPCE-06-OA [REDACTED]

Date Sampled: 6/6/2016

Lab Number: 007A

Date Received: 6/6/2016

Sample Type: Air, Can

Analysis Date: 6/6/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.39 psig

Final Pressure: -1.39 psig

Canister ID: 13969

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	S
127-18-4	Tetrachloroethene	ND	0.27	0.27	ND	0.04	0.04	1	S
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.16	ND	0.04	0.04	1	S
79-01-6	Trichloroethene	ND	0.21	0.21	ND	0.04	0.04	1	S
75-01-4	Vinyl Chloride	ND	0.10	0.10	ND	0.04	0.04	1	S

gaw
06/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



June 16, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0869**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for eight air samples collected at the Grand Rapids VI ER site. The samples were collected June 8 and 9, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on June 15, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16060658**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0869	Technical Reviewer (signature and date)	
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 16, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16060658	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Note: It appears that the RLs and MDLs were transposed on the results summary pages attached. The appropriate value to be used for non-detects were indicated in the attachment.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH

Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-06-1A [REDACTED] (BASEMENT)

Date Sampled: 6/8/2016

Lab Number: 004A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.54

Final Pressure: -1.54

Canister ID: 14208

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
127-18-4	Tetrachloroethene	58	3.4	0.27	8.6	0.5	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
79-01-6	Trichloroethene	1.3	0.21	0.21	0.24	0.04	0.04	1	
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	U

DRS
06/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH

Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-06-IA [REDACTED] (MAIN)

Date Sampled: 6/8/2016

Lab Number: 003A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.65

Final Pressure: -1.65

Canister ID: 14631

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
127-18-4	Tetrachloroethene	13	3.4	0.27	1.9	0.5	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
79-01-6	Trichloroethene	ND	2.7	0.21	ND	0.5	0.04	1	↓
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	↓

gaw
06/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH

Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-06-IA- [REDACTED]

Date Sampled: 6/8/2016

Lab Number: 005A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.63

Final Pressure: -1.63

Canister ID: 14616

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
127-18-4	Tetrachloroethene	35	3.4	0.27	5.2	0.5	0.04	1	U
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
79-01-6	Trichloroethene	0.81	0.21	0.21	0.15	0.04	0.04	1	U
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	U

gaw
06/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH
 Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-06-IA-
 Lab Number: 006A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -0.55
 Final Pressure: -0.55
 Canister ID: 14552

Date Sampled: 6/8/2016
 Date Received: 6/10/2016
 Analysis Date: 6/13/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
127-18-4	Tetrachloroethene	7.9	3.4	0.27	1.2	0.5	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
79-01-6	Trichloroethene	ND	2.7	0.21	ND	0.5	0.04	1	↓
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	↓

gaw
 06/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH

Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-07-IA- [REDACTED] (1)

Date Sampled: 6/8/2016

Lab Number: 001A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.38

Final Pressure: -1.38

Canister ID: 14179

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
127-18-4	Tetrachloroethene	8.9	3.4	0.27	1.3	0.5	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
79-01-6	Trichloroethene	ND	2.7	0.21	ND	0.5	0.04	1	
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	✓

gaw
06/16/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH

Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-07-IA- [REDACTED] (2)

Date Sampled: 6/8/2016

Lab Number: 002A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.12

Final Pressure: -2.12

Canister ID: 14468

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
127-18-4	Tetrachloroethene	19	3.4	0.27	2.7	0.5	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
79-01-6	Trichloroethene	ND	2.7	0.21	ND	0.5	0.04	1	U
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	U

gaw
06/16/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: **TETRA TECH**

Project: **Grand Rapids site**

Work Order No: 16060658

Sample Identification **GRPCE-07-OA** [REDACTED]

Date Sampled: 6/8/2016

Lab Number: 007A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.99

Final Pressure: -0.99

Canister ID: 14587

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	U
127-18-4	Tetrachloroethene	ND	3.4	0.27	ND	0.5	0.04	1	↓
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	↓
79-01-6	Trichloroethene	0.27	0.21	0.21	0.050	0.04	0.04	1	
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	U

gaw
06/16/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Jun-16

Client: TETRA TECH
Project: Grand Rapids site

Work Order No: 16060658

Sample Identification GRPCE-08-OA [REDACTED]

Date Sampled: 6/9/2016

Lab Number: 008A

Date Received: 6/10/2016

Sample Type: Air, Can

Analysis Date: 6/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.07 psig

Final Pressure: -0.07 psig

Canister ID: 14588

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
127-18-4	Tetrachloroethene	ND	3.4	0.27	ND	0.5	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.16	ND	0.5	0.04	1	✓
79-01-6	Trichloroethene	ND	2.7	0.21	ND	0.5	0.04	1	✓
75-01-4	Vinyl Chloride	ND	1.3	0.10	ND	0.5	0.04	1	✓

gaw
06/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
ND; Less than the indicated limit of detection (LOD)
RL; Report Limit
J; Value is between the MDL and Reporting Limit, estimated r
MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
S; Spike Recovery outside accepted recovery limits
R; RPD outside accepted recovery limits
T; Tentatively Identified Compound (TIC)
E; Value exceeds linear range of calibration curve



June 22, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
 Grand Rapids VI ER
 EPA Contract No. EP-S5-13-01
 Technical Direction Document No. S05-0001-1605-010
 Document Tracking No. 0879**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for one air sample collected at the Grand Rapids VI ER site. The sample was collected June 13, 2016 and was analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the revised final data on June 21, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
 Michael Browning, Tetra Tech Project Manager
 TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16060870**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0879	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 22, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16060870	Analyses	
		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		One air sample	
Field Duplicate Pairs		None	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH

Project: Madison Heights

Work Order No: 16060870

Sample Identification GRPCE-09-OA [REDACTED]

Date Sampled: 6/13/2016

Lab Number: 001A

Date Received: 6/15/2016

Sample Type: Air, Can

Analysis Date: 6/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.22 psig

Final Pressure: -2.22 psig

Canister ID: 14136

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.14	0.036	0.27	0.020	0.0053	0.04	1	J
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

gaw
06/22/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



June 27, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0906**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for seven air samples collected at the Grand Rapids VI ER site. The samples were collected June 19, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on June 24, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16061185**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0906	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 27 June 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> June 27, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16061185	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	Manual integration was required for trichloroethene for GRPCE-07-IA- [REDACTED] to determine the reported response.

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061185
 Sample Identification GRPCE-07-IA [REDACTED] (BASEMENT) Date Sampled: 6/19/2016
 Lab Number: 006A Date Received: 6/20/2016
 Sample Type: Air, Can Analysis Date: 6/20/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -0.99 psig
 Final Pressure: -0.99 psig
 Canister ID: 14569

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	29	0.036	0.27	4.2	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.38	0.021	0.21	0.070	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

QAW
06/27/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061185
 Sample Identification GRPCE-07-IA [REDACTED] (MAIN) Date Sampled: 6/19/2016
 Lab Number: 005A Date Received: 6/20/2016
 Sample Type: Air, Can Analysis Date: 6/20/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.44 psig
 Final Pressure: -1.44 psig
 Canister ID: 14022

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	U
127-18-4	Tetrachloroethene	4.3	0.036	0.27	0.64	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.43	0.021	0.21	0.080	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

gaw
de/27/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061185
 Sample Identification GRPCE-07-IA-1168 (BASEMENT) Date Sampled: 6/19/2016
 Lab Number: 004A Date Received: 6/20/2016
 Sample Type: Air, Can Analysis Date: 6/20/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.1 psig
 Final Pressure: -1.1 psig
 Canister ID: 14632

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RI (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	39	0.036	0.27	5.8	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

gaw
06/27/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (L.O.D)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16061185

Sample Identification GRPCE-07-1A-1168 (MAIN)

Date Sampled: 6/19/2016

Lab Number: 003A

Date Received: 6/20/2016

Sample Type: Air, Can

Analysis Date: 6/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.09 psig

Final Pressure: -1.09 psig

Canister ID: 14467

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	U
127-18-4	Tetrachloroethene	6.5	0.036	0.27	0.96	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

gaw
06/27/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16061185

Sample Identification GRPCE-08-IA [REDACTED] 1)

Date Sampled: 6/19/2016

Lab Number: 001A

Date Received: 6/20/2016

Sample Type: Air, Can

Analysis Date: 6/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.13 psig

Final Pressure: -1.13 psig

Canister ID: 14296

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	U
127-18-4	Tetrachloroethene	2.8	0.036	0.27	0.41	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

Jaw
06/27/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061185
 Sample Identification GRPCE-08-IA (redacted) 2) Date Sampled: 6/19/2016
 Lab Number: 002A Date Received: 6/20/2016
 Sample Type: Air, Can Analysis Date: 6/20/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.07 psig
 Final Pressure: -1.07 psig
 Canister ID: 14583

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	U
127-18-4	Tetrachloroethene	3.7	0.036	0.27	0.55	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

gaw
06/27/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061185

Sample Identification GRPCE-10-OA [REDACTED] Date Sampled: 6/19/2016
 Lab Number: 007A Date Received: 6/20/2016
 Sample Type: Air, Can Analysis Date: 6/20/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.58 psig
 Final Pressure: -1.58 psig
 Canister ID: 14021

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	U
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	U
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	U
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

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06/27/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



July 6, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0914**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for one air sample collected at the Grand Rapids VI ER site. The sample was collected June 24, 2016 and was analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 1, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16061766**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0914	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 6 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 5, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16061766	Analyses	
Analyses		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		One air sample	
Field Duplicate Pairs		None	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 29-Jun-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16061766
 Sample Identification GRPCE-1-OA [REDACTED] Date Sampled: 6/24/2016
 Lab Number: 001A Date Received: 6/28/2016
 Sample Type: Air, Can Analysis Date: 6/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.69 psig
 Final Pressure: -1.69 psig
 Canister ID: 14542

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.14	0.036	0.27	0.020	0.0053	0.04	1	J
156-60-5	trans-1,2-Dichloroethene	0.20	0.019	0.16	0.050	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	U

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07/05/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



July 6, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0920**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for three air samples (including a field duplicate) collected at the Grand Rapids VI ER site. The samples were collected June 25, 2016 and was analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the final data on July 5, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the exceedances discussed in this validation.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG P1603234**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0920	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 6 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 6, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603234		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Three air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-01-IA- [REDACTED] (Basement Hall)/GRPCE-01-IA- [REDACTED] (Basement Hall)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the exceedances discussed in this validation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
N	GRPCE-01-IA- [REDACTED] (Basement Hall)/GRPCE-01-IA- [REDACTED] (Basement Hall)-DP: The precision criterion was exceeded for trans-1,2-dichloroethene; therefore, the results were qualified as estimated (J/UJ) for both samples.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.53x: GRPCE-01-IA- [REDACTED] (Basement Hall)-DP 1.71x: GRPCE-01-IA- [REDACTED] (Main) 1.68x: GRPCE-01-IA- [REDACTED] (Basement Hall)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
ALS LABORATORIES REPORT NO. P1603234

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	Reporting_Limit	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement Hall)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Basement Hall)	Tetrachloroethene	3.9		ug/m3	0.12	0.17	3.9	
GRPCE-01-IA-	(Basement Hall)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	UJ
GRPCE-01-IA-	(Basement Hall)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Basement Hall)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Basement Hall)-DP	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement Hall)-DP	Tetrachloroethene	3.8		ug/m3	0.11	0.15	3.8	
GRPCE-01-IA-	(Basement Hall)-DP	trans-1,2-Dichloroethene	0.98		ug/m3	0.14	0.15	0.98	J
GRPCE-01-IA-	(Basement Hall)-DP	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement Hall)-DP	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.48		ug/m3	0.12	0.17	0.48	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U



July 13, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0927**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 29 air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected from June 24 through July 4, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics and ALS Environmental. Tetra Tech received the last of the data on July 11, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the exceedances discussed in this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
EUROFINS-AIR TOXICS SDGS 1606556, 1606587, AND 1607089
ALS SDGS P1603260 AND P1603338**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0927A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 13 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 12, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1606556	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Two air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.68x: GRPCE-01-IA-[REDACTED] SFR) and GRPCE-01-IA-[REDACTED] 2 nd Floor-W)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1606556

CLIENTSAMPID		COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_QUAL
GRPCE-01-IA-	[REDACTED] SFR)	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] SFR)	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] SFR)	cis-1,2-Dichloroethene	0.17	PPBV	0.43		0.43	
GRPCE-01-IA-	[REDACTED] SFR)	Trichloroethene	0.17	PPBV	0.74		0.74	
GRPCE-01-IA-	[REDACTED] SFR)	Tetrachloroethene	0.17	PPBV	6.5		6.5	
GRPCE-01-IA-	[REDACTED] SFR)	Vinyl Chloride	0.43	UG/M3		ND	0.43	U
GRPCE-01-IA-	[REDACTED] SFR)	trans-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA-	[REDACTED] SFR)	cis-1,2-Dichloroethene	0.67	UG/M3	1.7		1.7	
GRPCE-01-IA-	[REDACTED] SFR)	Trichloroethene	0.90	UG/M3	4.0		4.0	
GRPCE-01-IA-	[REDACTED] SFR)	Tetrachloroethene	1.1	UG/M3	44		44	
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	cis-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Trichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Tetrachloroethene	0.17	PPBV	1.2		1.2	
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Vinyl Chloride	0.43	UG/M3		ND	0.43	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	trans-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	cis-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Trichloroethene	0.90	UG/M3		ND	0.90	U
GRPCE-01-IA-	[REDACTED] 2nd Floor-W)	Tetrachloroethene	1.1	UG/M3	8.0		8.0	

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0927B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 13 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 12, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1606587	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Four air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-01-IA-429Umatilla/GRPCE-01-IA-429Umatilla-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	Associated results were non-detect.

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.57x: GRPCE-02-IA-[REDACTED] (Main) 4.55x: GRPCE-01-IA-[REDACTED] DP 1.62x: GRPCE-02-IA-[REDACTED] (Basement) 5.47x: GRPCE-01-IA-[REDACTED]

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1606587

CLIENTSAMPID		COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_QUAL
GRPCE-01-IA-		Vinyl Chloride	0.55	PPBV		ND	0.55	U
GRPCE-01-IA-		trans-1,2-Dichloroethene	0.55	PPBV		ND	0.55	U
GRPCE-01-IA-		cis-1,2-Dichloroethene	0.55	PPBV		ND	0.55	U
GRPCE-01-IA-		Trichloroethene	0.55	PPBV		ND	0.55	U
GRPCE-01-IA-		Tetrachloroethene	0.55	PPBV		ND	0.55	U
GRPCE-01-IA-		Vinyl Chloride	1.4	UG/M3		ND	1.4	U
GRPCE-01-IA-		trans-1,2-Dichloroethene	2.2	UG/M3		ND	2.2	U
GRPCE-01-IA-		cis-1,2-Dichloroethene	2.2	UG/M3		ND	2.2	U
GRPCE-01-IA-		Trichloroethene	2.9	UG/M3		ND	2.9	U
GRPCE-01-IA-		Tetrachloroethene	3.7	UG/M3		ND	3.7	U
GRPCE-01-IA-	DP	Vinyl Chloride	2.3	PPBV		ND	2.3	U
GRPCE-01-IA-	DP	cis-1,2-Dichloroethene	2.3	PPBV		ND	2.3	U
GRPCE-01-IA-	DP	Trichloroethene	2.3	PPBV		ND	2.3	U
GRPCE-01-IA-	DP	Tetrachloroethene	2.3	PPBV		ND	2.3	U
GRPCE-01-IA-	DP	trans-1,2-Dichloroethene	2.3	PPBV		ND	2.3	U
GRPCE-01-IA-	DP	Vinyl Chloride	5.8	UG/M3		ND	5.8	U
GRPCE-01-IA-	DP	cis-1,2-Dichloroethene	9.0	UG/M3		ND	9.0	U
GRPCE-01-IA-	DP	Trichloroethene	12	UG/M3		ND	12	U
GRPCE-01-IA-	DP	Tetrachloroethene	15	UG/M3		ND	15	U
GRPCE-01-IA-	DP	trans-1,2-Dichloroethene	9.0	UG/M3		ND	9.0	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-	(Main)	Trichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	0.16	PPBV	0.032	J	0.032	J
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.40	UG/M3		ND	0.40	U
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.62	UG/M3		ND	0.62	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.62	UG/M3		ND	0.62	U
GRPCE-02-IA-	(Main)	Trichloroethene	0.84	UG/M3		ND	0.84	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	1.1	UG/M3	0.22	J	0.22	J
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.16	PPBV		ND	0.16	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1606587

CLIENTSAMPID		COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_QUAL
GRPCE-02-IA-		(Basement) trans-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-		(Basement) cis-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-		(Basement) Trichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-02-IA-		(Basement) Tetrachloroethene	0.16	PPBV	0.042	J	0.042	J
GRPCE-02-IA-		(Basement) Vinyl Chloride	0.41	UG/M3		ND	0.41	U
GRPCE-02-IA-		(Basement) trans-1,2-Dichloroethene	0.64	UG/M3		ND	0.64	U
GRPCE-02-IA-		(Basement) cis-1,2-Dichloroethene	0.64	UG/M3		ND	0.64	U
GRPCE-02-IA-		(Basement) Trichloroethene	0.87	UG/M3		ND	0.87	U
GRPCE-02-IA-		(Basement) Tetrachloroethene	1.1	UG/M3	0.29	J	0.29	J

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0927C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 13 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 13, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1607089	Analyses	
Analyses		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		Thirteen air samples (including a field duplicate)	
Field Duplicate Pairs		GRPCE-01-IA- [REDACTED] (WDH)/GRPCE-01-IA- [REDACTED] (WDH)-DP	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.43x: GRPCE-01-IA- [REDACTED] (Basement) 1.73x: GRPCE-01-IA- [REDACTED] (WDH) 1.52x: GRPCE-01-IA- [REDACTED] (Carpentry) 1.99x: GRPCE-01-IA- [REDACTED] (Main) 1.53x: GRPCE-01-IA- [REDACTED] (Basement) 2.44x: GRPCE-01-IA- [REDACTED] (HBI) 1.57x: GRPCE-01-IA- [REDACTED] 2.78x: GRPCE-01-IA- [REDACTED] (Main) 1.62x: GRPCE-01-IA- [REDACTED] (Basement) 2.87x: GRPCE-01-IA- [REDACTED] (Main) 1.70x: GRPCE-01-IA- [REDACTED] (Basement) and GRPCE-01-IA- [REDACTED] (Outside) 1.71x: GRPCE-01-IA- [REDACTED] (WDH)-DP

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607089

	CLIENTSAMPID	COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_DATAFLAGS
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.20	PPBV		ND	0.20	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.20	PPBV	0.092	J	0.092	J
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.20	PPBV		ND	0.20	U
GRPCE-01-IA-	(Main)	Trichloroethene	0.20	PPBV		ND	0.20	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.20	PPBV	0.038	J	0.038	J
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.51	UG/M3		ND	0.51	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.79	UG/M3	0.36	J	0.36	J
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.79	UG/M3		ND	0.79	U
GRPCE-01-IA-	(Main)	Trichloroethene	1.1	UG/M3		ND	1.1	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.3	UG/M3	0.26	J	0.26	J
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-	(Basement)	Trichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.16	PPBV	0.22		0.22	
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.41	UG/M3		ND	0.41	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.64	UG/M3		ND	0.64	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.64	UG/M3		ND	0.64	U
GRPCE-01-IA-	(Basement)	Trichloroethene	0.87	UG/M3		ND	0.87	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	1.1	UG/M3	1.5		1.5	
GRPCE-01-IA-		Vinyl Chloride	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-		trans-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-		cis-1,2-Dichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-		Trichloroethene	0.16	PPBV		ND	0.16	U
GRPCE-01-IA-		Tetrachloroethene	0.16	PPBV	0.21		0.21	
GRPCE-01-IA-		Vinyl Chloride	0.40	UG/M3		ND	0.40	U
GRPCE-01-IA-		trans-1,2-Dichloroethene	0.62	UG/M3		ND	0.62	U
GRPCE-01-IA-		cis-1,2-Dichloroethene	0.62	UG/M3		ND	0.62	U
GRPCE-01-IA-		Trichloroethene	0.84	UG/M3		ND	0.84	U
GRPCE-01-IA-		Tetrachloroethene	1.1	UG/M3	1.4		1.4	
GRPCE-01-IA-	(HBI)	Vinyl Chloride	0.24	PPBV		ND	0.24	U
GRPCE-01-IA-	(HBI)	trans-1,2-Dichloroethene	0.24	PPBV		ND	0.24	U
GRPCE-01-IA-	(HBI)	cis-1,2-Dichloroethene	0.24	PPBV		ND	0.24	U
GRPCE-01-IA-	(HBI)	Trichloroethene	0.24	PPBV		ND	0.24	U
GRPCE-01-IA-	(HBI)	Tetrachloroethene	0.24	PPBV		ND	0.24	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607089

	CLIENTSAMPID	COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_DATAFLAGS
GRPCE-01-IA-	(HBI)	Vinyl Chloride	0.62	UG/M3		ND	0.62	U
GRPCE-01-IA-	(HBI)	trans-1,2-Dichloroethene	0.97	UG/M3		ND	0.97	U
GRPCE-01-IA-	(HBI)	cis-1,2-Dichloroethene	0.97	UG/M3		ND	0.97	U
GRPCE-01-IA-	(HBI)	Trichloroethene	1.3	UG/M3		ND	1.3	U
GRPCE-01-IA-	(HBI)	Tetrachloroethene	1.6	UG/M3		ND	1.6	U
GRPCE-01-IA-	(WDH)	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH)	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH)	cis-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH)	Trichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH)	Tetrachloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH)	Vinyl Chloride	0.44	UG/M3		ND	0.44	U
GRPCE-01-IA-	(WDH)	trans-1,2-Dichloroethene	0.68	UG/M3		ND	0.68	U
GRPCE-01-IA-	(WDH)	cis-1,2-Dichloroethene	0.68	UG/M3		ND	0.68	U
GRPCE-01-IA-	(WDH)	Trichloroethene	0.93	UG/M3		ND	0.93	U
GRPCE-01-IA-	(WDH)	Tetrachloroethene	1.2	UG/M3		ND	1.2	U
GRPCE-01-IA-	(WDH) DP	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH) DP	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH) DP	cis-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH) DP	Trichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-	(WDH) DP	Tetrachloroethene	0.17	PPBV	0.031	J	0.031	J
GRPCE-01-IA-	(WDH) DP	Vinyl Chloride	0.44	UG/M3		ND	0.44	U
GRPCE-01-IA-	(WDH) DP	trans-1,2-Dichloroethene	0.68	UG/M3		ND	0.68	U
GRPCE-01-IA-	(WDH) DP	cis-1,2-Dichloroethene	0.68	UG/M3		ND	0.68	U
GRPCE-01-IA-	(WDH) DP	Trichloroethene	0.92	UG/M3		ND	0.92	U
GRPCE-01-IA-	(WDH) DP	Tetrachloroethene	1.2	UG/M3	0.21	J	0.21	J
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.28	PPBV		ND	0.28	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.28	PPBV		ND	0.28	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.28	PPBV		ND	0.28	U
GRPCE-01-IA-	(Main)	Trichloroethene	0.28	PPBV		ND	0.28	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.28	PPBV		ND	0.28	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.71	UG/M3		ND	0.71	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	1.1	UG/M3		ND	1.1	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	1.1	UG/M3		ND	1.1	U
GRPCE-01-IA-	(Main)	Trichloroethene	1.5	UG/M3		ND	1.5	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.9	UG/M3		ND	1.9	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607089

CLIENTSAMPID	COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_DATAFLAGS
GRPCE-01-IA-██████████ (Basement)	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Basement)	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Basement)	cis-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Basement)	Trichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Basement)	Tetrachloroethene	0.17	PPBV	0.10	J	0.10	J
GRPCE-01-IA-██████████ (Basement)	Vinyl Chloride	0.43	UG/M3		ND	0.43	U
GRPCE-01-IA-██████████ (Basement)	trans-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA-██████████ (Basement)	cis-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA-██████████ (Basement)	Trichloroethene	0.91	UG/M3		ND	0.91	U
GRPCE-01-IA-██████████ (Basement)	Tetrachloroethene	1.2	UG/M3	0.70	J	0.70	J
GRPCE-01-IA-██████████ (Basement)	Vinyl Chloride	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Basement)	trans-1,2-Dichloroethene	0.15	PPBV	0.070	J	0.070	J
GRPCE-01-IA-██████████ (Basement)	cis-1,2-Dichloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Basement)	Trichloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Basement)	Tetrachloroethene	0.15	PPBV	0.28		0.28	
GRPCE-01-IA-██████████ (Basement)	Vinyl Chloride	0.39	UG/M3		ND	0.39	U
GRPCE-01-IA-██████████ (Basement)	trans-1,2-Dichloroethene	0.61	UG/M3	0.28	J	0.28	J
GRPCE-01-IA-██████████ (Basement)	cis-1,2-Dichloroethene	0.61	UG/M3		ND	0.61	U
GRPCE-01-IA-██████████ (Basement)	Trichloroethene	0.82	UG/M3		ND	0.82	U
GRPCE-01-IA-██████████ (Basement)	Tetrachloroethene	1.0	UG/M3	1.9		1.9	
GRPCE-01-IA-██████████ (Carpentry)	Vinyl Chloride	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Carpentry)	trans-1,2-Dichloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Carpentry)	cis-1,2-Dichloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Carpentry)	Trichloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Carpentry)	Tetrachloroethene	0.15	PPBV		ND	0.15	U
GRPCE-01-IA-██████████ (Carpentry)	Vinyl Chloride	0.39	UG/M3		ND	0.39	U
GRPCE-01-IA-██████████ (Carpentry)	trans-1,2-Dichloroethene	0.60	UG/M3		ND	0.60	U
GRPCE-01-IA-██████████ (Carpentry)	cis-1,2-Dichloroethene	0.60	UG/M3		ND	0.60	U
GRPCE-01-IA-██████████ (Carpentry)	Trichloroethene	0.82	UG/M3		ND	0.82	U
GRPCE-01-IA-██████████ (Carpentry)	Tetrachloroethene	1.0	UG/M3		ND	1.0	U
GRPCE-01-IA-██████████ (Outside)	Vinyl Chloride	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Outside)	trans-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Outside)	cis-1,2-Dichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Outside)	Trichloroethene	0.17	PPBV		ND	0.17	U
GRPCE-01-IA-██████████ (Outside)	Tetrachloroethene	0.17	PPBV		ND	0.17	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607089

CLIENTSAMPID	COMPOUND NAME	REPLMT	UNITS	RESULTS	DATAFLAGS	VAL_RESULTS	VAL_DATAFLAGS
GRPCE-01-IA- (Outside)	Vinyl Chloride	0.43	UG/M3		ND	0.43	U
GRPCE-01-IA- (Outside)	trans-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA- (Outside)	cis-1,2-Dichloroethene	0.67	UG/M3		ND	0.67	U
GRPCE-01-IA- (Outside)	Trichloroethene	0.91	UG/M3		ND	0.91	U
GRPCE-01-IA- (Outside)	Tetrachloroethene	1.2	UG/M3		ND	1.2	U
GRPCE-01-IA- (Basement)	Vinyl Chloride	0.14	PPBV		ND	0.14	U
GRPCE-01-IA- (Basement)	trans-1,2-Dichloroethene	0.14	PPBV	0.24		0.24	
GRPCE-01-IA- (Basement)	cis-1,2-Dichloroethene	0.14	PPBV		ND	0.14	U
GRPCE-01-IA- (Basement)	Trichloroethene	0.14	PPBV		ND	0.14	U
GRPCE-01-IA- (Basement)	Tetrachloroethene	0.14	PPBV	0.14		0.14	
GRPCE-01-IA- (Basement)	Vinyl Chloride	0.36	UG/M3		ND	0.36	U
GRPCE-01-IA- (Basement)	trans-1,2-Dichloroethene	0.57	UG/M3	0.95		0.95	
GRPCE-01-IA- (Basement)	cis-1,2-Dichloroethene	0.57	UG/M3		ND	0.57	U
GRPCE-01-IA- (Basement)	Trichloroethene	0.77	UG/M3		ND	0.77	U
GRPCE-01-IA- (Basement)	Tetrachloroethene	0.97	UG/M3	0.99		0.99	
GRPCE-01-IA- (Main)	Vinyl Chloride	0.29	PPBV		ND	0.29	U
GRPCE-01-IA- (Main)	trans-1,2-Dichloroethene	0.29	PPBV		ND	0.29	U
GRPCE-01-IA- (Main)	cis-1,2-Dichloroethene	0.29	PPBV		ND	0.29	U
GRPCE-01-IA- (Main)	Trichloroethene	0.29	PPBV		ND	0.29	U
GRPCE-01-IA- (Main)	Tetrachloroethene	0.29	PPBV	0.16	J	0.16	J
GRPCE-01-IA- (Main)	Vinyl Chloride	0.73	UG/M3		ND	0.73	U
GRPCE-01-IA- (Main)	trans-1,2-Dichloroethene	1.1	UG/M3		ND	1.1	U
GRPCE-01-IA- (Main)	cis-1,2-Dichloroethene	1.1	UG/M3		ND	1.1	U
GRPCE-01-IA- (Main)	Trichloroethene	1.5	UG/M3		ND	1.5	U
GRPCE-01-IA- (Main)	Tetrachloroethene	1.9	UG/M3	1.1	J	1.1	J

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0927D	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 13 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 12, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603260	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Thirteen air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.31x: VOCs for GRPCE-01-IA-[REDACTED] (Main - Common) 1.34x: VOCs for GRPCE-01-IA-[REDACTED] (Main – Conf. Rm) 1.51x: VOCs for GRPCE-01-IA-341Hall (Basement) and GRPCE-01-IA-[REDACTED] (Electrical Room) 1.63x: VOCs for GRPCE-01-IA-341Hall (Main - S) 1.66x: VOCs for GRPCE-01-IA-[REDACTED] (2 nd Floor – S) 1.71x: VOCs for GRPCE-01-IA-[REDACTED] (2 nd Floor – N) 1.76x: VOCs for GRPCE-01-OA-[REDACTED] 1.78x: VOCs for GRPCE-01-IA-[REDACTED] (Suite 4) 2.05x: VOCs except tetrachloroethene for GRPCE-01-IA-[REDACTED] (Basement - W) 3.275x: VOCs for GRPCE-01-IA-[REDACTED] (Basement - S) 3.375x: VOCs except tetrachloroethene for GRPCE-01-IA-[REDACTED] (Basement - N) 5.37x: VOCs for GRPCE-01-IA-[REDACTED] (Common) 10.8x: tetrachloroethene for GRPCE-01-IA-[REDACTED] (Basement - N) 20.5x: tetrachloroethene for GRPCE-01-IA-[REDACTED] (Basement - W)



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-IA-341Hall (Main - S)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: AC02125

Date Collected: 6/25/16

Date Received: 6/27/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.39 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.63

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.16	ND	0.064	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	ND	0.041	
156-59-2	cis-1,2-Dichloroethene	ND	0.16	ND	0.041	
79-01-6	Trichloroethene	ND	0.16	ND	0.030	
127-18-4	Tetrachloroethene	0.46	0.16	0.068	0.024	

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

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

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07/12/16

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories
 Client Sample ID: GRPCE-01-IA-341Hall (Basement)
 Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010
 Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
 Analyst: Lusine Hakobyan
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: SC00304

ALS Project ID: P1603260
 ALS Sample ID: P1603260-002

Date Collected: 6/25/16
 Date Received: 6/27/16
 Date Analyzed: 7/5/16
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.29 Final Pressure (psig): 7.08

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.15	ND	0.059	
156-60-5	trans-1,2-Dichloroethene	ND	0.15	ND	0.038	
156-59-2	cis-1,2-Dichloroethene	ND	0.15	ND	0.038	
79-01-6	Trichloroethene	ND	0.15	ND	0.028	
127-18-4	Tetrachloroethene	1.5	0.15	0.23	0.022	

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

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

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 07/12/16

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-OA- [REDACTED]

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-003

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00301

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.21 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.76

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.18	ND	0.069	
156-60-5	trans-1,2-Dichloroethene	ND	0.18	ND	0.044	
156-59-2	cis-1,2-Dichloroethene	ND	0.18	ND	0.044	
79-01-6	Trichloroethene	ND	0.18	ND	0.033	
127-18-4	Tetrachloroethene	0.26	0.18	0.038	0.026	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (2nd Floor - N)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-004

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00834

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.97 Final Pressure (psig): 3.69

Canister Dilution Factor: 1.71

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.17	ND	0.067	
156-60-5	trans-1,2-Dichloroethene	ND	0.17	ND	0.043	
156-59-2	cis-1,2-Dichloroethene	ND	0.17	ND	0.043	
79-01-6	Trichloroethene	ND	0.17	ND	0.032	
127-18-4	Tetrachloroethene	10	0.17	1.5	0.025	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (2nd Floor - S)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-005

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC01742

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.68 Final Pressure (psig): 3.64

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.17	ND	0.065	
156-60-5	trans-1,2-Dichloroethene	ND	0.17	ND	0.042	
156-59-2	cis-1,2-Dichloroethene	ND	0.17	ND	0.042	
79-01-6	Trichloroethene	ND	0.17	ND	0.031	
127-18-4	Tetrachloroethene	10	0.17	1.5	0.024	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA-1167Madison (Main - Common)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-006

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: AC02085

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.60 Final Pressure (psig): 3.80

Canister Dilution Factor: 1.31

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.13	ND	0.051	
156-60-5	trans-1,2-Dichloroethene	ND	0.13	ND	0.033	
156-59-2	cis-1,2-Dichloroethene	ND	0.13	ND	0.033	
79-01-6	Trichloroethene	0.41	0.13	0.076	0.024	
127-18-4	Tetrachloroethene	75	0.13	11	0.019	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Main - Conf. Rm)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-007

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00091

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.86 Final Pressure (psig): 3.83

Canister Dilution Factor: 1.34

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.13	ND	0.052	
156-60-5	trans-1,2-Dichloroethene	0.13	0.13	0.034	0.034	
156-59-2	cis-1,2-Dichloroethene	0.44	0.13	0.11	0.034	
79-01-6	Trichloroethene	0.49	0.13	0.092	0.025	
127-18-4	Tetrachloroethene	80	0.13	12	0.020	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Basement - S)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-008

Test Code: EPA TO-15

Date Collected: 6/25/16

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/1/16

Analyst: Lusine Hakobyan

Date Analyzed: 7/5/16

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.40 Liter(s)

Test Notes:

Container ID: AC02126

Initial Pressure (psig): -0.66 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.31

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.33 U	ND	0.13 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.33 U	ND	0.083 U	
156-59-2	cis-1,2-Dichloroethene	0.95	0.33	0.24	0.083	
79-01-6	Trichloroethene	1.7	0.33	0.32	0.061	
127-18-4	Tetrachloroethene	300	0.33	44	0.048	

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

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

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Client: CT Laboratories
 Client Sample ID: GRPCE-01-IA- [REDACTED] (Basement - N)
 Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010
 Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
 Analyst: Lusine Hakobyan
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: SC00844

ALS Project ID: P1603260
 ALS Sample ID: P1603260-009

Date Collected: 6/25/16
 Date Received: 7/1/16
 Date Analyzed: 7/5 - 7/6/16
 Volume(s) Analyzed: 0.40 Liter(s)
 0.050 Liter(s)

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.56

Canister Dilution Factor: 1.35

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.34	ND	0.13	
156-60-5	trans-1,2-Dichloroethene	ND	0.34	ND	0.085	
156-59-2	cis-1,2-Dichloroethene	ND	0.34	ND	0.085	
79-01-6	Trichloroethene	1.6	0.34	0.29	0.063	
127-18-4	Tetrachloroethene	340	2.7	50	0.40	DL

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

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

D = The reported result is from a dilution.

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ALS ENVIRONMENTAL

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Basement - W)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-010

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: AC02048

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/5 - 7/6/16

Volume(s) Analyzed: 1.00 Liter(s)

0.10 Liter(s)

Initial Pressure (psig): -5.75 Final Pressure (psig): 3.65

Canister Dilution Factor: 2.05

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.21 U	ND	0.080 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.21 ↓	ND	0.052 ↓	
156-59-2	cis-1,2-Dichloroethene	ND	0.21 ↓	ND	0.052 ↓	
79-01-6	Trichloroethene	0.98	0.21	0.18	0.038	
127-18-4	Tetrachloroethene	220	2.1	33	0.30	D

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

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

D = The reported result is from a dilution.

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Suite 4)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-011

Test Code: EPA TO-15

Date Collected: 6/25/16

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/1/16

Analyst: Lusine Hakobyan

Date Analyzed: 7/5/16

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01038

Initial Pressure (psig): -4.22 Final Pressure (psig): 3.92

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.18	ND	0.070	
156-60-5	trans-1,2-Dichloroethene	ND	0.18	ND	0.045	
156-59-2	cis-1,2-Dichloroethene	ND	0.18	ND	0.045	
79-01-6	Trichloroethene	ND	0.18	ND	0.033	
127-18-4	Tetrachloroethene	0.50	0.18	0.073	0.026	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Common)

Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010

ALS Project ID: P1603260

ALS Sample ID: P1603260-012

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS01131

Date Collected: 6/25/16

Date Received: 7/1/16

Date Analyzed: 7/6/16

Volume(s) Analyzed: 0.50 Liter(s)

Initial Pressure (psig): -4.44 Final Pressure (psig): 3.68

Canister Dilution Factor: 1.79

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.36	ND	0.14	
156-60-5	trans-1,2-Dichloroethene	ND	0.36	ND	0.090	
156-59-2	cis-1,2-Dichloroethene	ND	0.36	ND	0.090	
79-01-6	Trichloroethene	ND	0.36	ND	0.067	
127-18-4	Tetrachloroethene	0.41	0.36	0.060	0.053	

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

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

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: CT Laboratories
 Client Sample ID: GRPCE-01-IA- [REDACTED] (Electrical Room)
 Client Project ID: Grand Rapids Vapor Intrusion ER / 103X90260001S051605010
 Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
 Analyst: Lusine Hakobyan
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC01912

ALS Project ID: P1603260
 ALS Sample ID: P1603260-013

Date Collected: 6/25/16
 Date Received: 7/1/16
 Date Analyzed: 7/5/16
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.33 Final Pressure (psig): 3.93

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.15	ND	0.059	U
156-60-5	trans-1,2-Dichloroethene	ND	0.15	ND	0.038	↓
156-59-2	cis-1,2-Dichloroethene	ND	0.15	ND	0.038	↓
79-01-6	Trichloroethene	ND	0.15	ND	0.028	↓
127-18-4	Tetrachloroethene	0.41	0.15	0.060	0.022	

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

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

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**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0927E	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 13 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 12, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603338	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the exceedances discussed in this validation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
N	The percent relative standard deviation for trans-1,2-dichloroethene was above the acceptance criteria; therefore the associated non-detect results were qualified as estimated (UJ).

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.28x: VOCs for GRPCE-01-IA-[REDACTED] (Basement) 1.63x: VOCs for GRPCE-01-IA-[REDACTED] (Basement) 1.66x: VOCs for GRPCE-01-IA-[REDACTED] 1.70x: VOCs for GRPCE-01-IA-[REDACTED] and GRPCE-01-IA-[REDACTED] (Main) 1.79x: VOCs for GRPCE-01-IA-[REDACTED] (Main) 1.80x: VOCs for GRPCE-01-IA-[REDACTED] (Main)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



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RESULTS OF ANALYSIS

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED]

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-001

Test Code: EPA TO-15

Date Collected: 6/24/16

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: 7/1/16

Analyst: Simon Cao

Date Analyzed: 7/5/16

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS00914

Initial Pressure (psig): -3.55 Final Pressure (psig): 3.76

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.17 U	ND	0.065 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.17 UJ	ND	0.042 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.17 U	ND	0.042 U	
79-01-6	Trichloroethene	ND	0.17 U	ND	0.031 U	
127-18-4	Tetrachloroethene	78	0.17	12	0.024	

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

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

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: CT Laboratories

Client Sample ID: GRPCE-01-1A- [REDACTED] (Main)

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-002

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Summa Canister

Test Notes:

Container ID: SC01608

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.44 Final Pressure (psig): 3.72

Canister Dilution Factor: 1.80

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.18 U	ND	0.070 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.18 UJ	ND	0.045 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.18 U	ND	0.045 U	
79-01-6	Trichloroethene	ND	0.18 U	ND	0.034 U	
127-18-4	Tetrachloroethene	1.1	0.18	0.16	0.027	

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

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

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Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED]

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-004

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00200

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.68 Final Pressure (psig): 4.08

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.17 U	ND	0.067 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.17 UJ	ND	0.043 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.17 U	ND	0.043 U	
79-01-6	Trichloroethene	ND	0.17 ↓	ND	0.032 ↓	
127-18-4	Tetrachloroethene	ND	0.17 ↓	ND	0.025 ↓	

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

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

gaw
07/12/16

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Main)

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-005

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00550

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.84 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.17	ND	0.067	
156-60-5	trans-1,2-Dichloroethene	ND	0.17	ND	0.043	
156-59-2	cis-1,2-Dichloroethene	ND	0.17	ND	0.043	
79-01-6	Trichloroethene	ND	0.17	ND	0.032	
127-18-4	Tetrachloroethene	ND	0.17	ND	0.025	

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

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

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Basement)

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-006

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00532

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.48 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.63

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.16 U	ND	0.064 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.16 UJ	ND	0.041 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.16 U	ND	0.041 U	
79-01-6	Trichloroethene	ND	0.16 U	ND	0.030 U	
127-18-4	Tetrachloroethene	9.6	0.16	1.4	0.024	

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

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

gaw
07/12/16

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Main)

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-007

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00643

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.28 Final Pressure (psig): 3.90

Canister Dilution Factor: 1.79

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.18 U	ND	0.070 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.18 UJ	ND	0.045 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.18 U	ND	0.045 U	
79-01-6	Trichloroethene	ND	0.18 U	ND	0.033 U	
127-18-4	Tetrachloroethene	0.80	0.18	0.12	0.026	

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

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

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07/12/16

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: CT Laboratories

Client Sample ID: GRPCE-01-IA- [REDACTED] (Basement)

Client Project ID: Grand Rapids Vapor Intrusion E.R. / 103X90260001S051605010

ALS Project ID: P1603338

ALS Sample ID: P1603338-008

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00180

Date Collected: 6/24/16

Date Received: 7/1/16

Date Analyzed: 7/5/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.47 Final Pressure (psig): 3.53

Canister Dilution Factor: 1.28

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.13 U	ND	0.050 U	
156-60-5	trans-1,2-Dichloroethene	ND	0.13 UJ	ND	0.032 UJ	
156-59-2	cis-1,2-Dichloroethene	ND	0.13 U	ND	0.032 U	
79-01-6	Trichloroethene	ND	0.13 U	ND	0.024 U	
127-18-4	Tetrachloroethene	4.3	0.13	0.63	0.019	

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

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

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07/12/16



July 15, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0943**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for eight air samples (including a field duplicate) collected at the Grand Rapids VI ER site. The samples were collected July 6, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 10, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

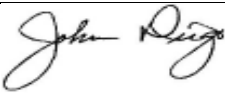

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16070362**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0943	QC Reviewer (signature and date)	 15 July 2016
Data Reviewer (signature and date)	 July 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16070362	Analyses	
Analyses		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		Eight air samples (including a field duplicate)	
Field Duplicate Pairs		GRPCE-09-IA-████ (1)/GRPCE-09-IA-████ (1)-DP	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	<p>Sample GRPCE-08-IA- [REDACTED] (BASEMENT) was analyzed at a 2-fold dilution for VOCs.</p> <p>Samples GRPCE-08-IA- [REDACTED] (MAIN), GRPCE-08-IA- [REDACTED] GRPCE-09-IA- [REDACTED] (1)-DP, GRPCE-09-IA- [REDACTED] (2), and GRPCE-12-OA- [REDACTED] were analyzed at 1.98-fold dilutions for VOCs.</p> <p>Sample GRPCE-08-IA- [REDACTED] was analyzed at a 2-fold dilution for VOCs except trans-1,2-dichloroethene, which was analyzed at a 10-fold dilution.</p> <p>Sample GRPCE-09-IA- [REDACTED] (1) was analyzed at a 1.99-fold dilution for VOCs.</p>

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-08-1A [REDACTED] (BASEMENT)

Date Sampled: 7/6/2016

Lab Number: 007A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -8.0 psig

Final Pressure: -1.6 psig

Canister ID: 14134

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.32	U	ND	0.012	0.08	U 2
127-18-4	Tetrachloroethene	4.7	0.075	0.54	0.70	0.011	0.08		2
156-60-5	trans-1,2-Dichloroethene	180	0.039	0.32	44	0.0098	0.08		2
79-01-6	Trichloroethene	0.32	0.042	0.43	0.060	0.0078	0.08		2
75-01-4	Vinyl Chloride	ND	0.046	0.20	U	ND	0.018	0.08	U 2

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07/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-08-IA [REDACTED] (MAIN)

Date Sampled: 7/6/2016

Lab Number: 006A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -7.8 psig

Final Pressure: -1.3 psig

Canister ID: 14069

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.31 U	ND	0.012	0.079 U	1.98	
127-18-4	Tetrachloroethene	1.5	0.068	0.54	0.22	0.01	0.079	1.98	
156-60-5	trans-1,2-Dichloroethene	6.7	0.038	0.31	1.7	0.0097	0.079	1.98	
79-01-6	Trichloroethene	0.21 J	0.041	0.42	0.040 J	0.0077	0.079	1.98	♂
75-01-4	Vinyl Chloride	ND	0.043	0.20 U	ND	0.017	0.079 U	1.98	

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07/15/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-08-IA [REDACTED]

Date Sampled: 7/6/2016

Lab Number: 005A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -8.0 psig

Final Pressure: -1.6 psig

Canister ID: 14146

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.32 U	ND	0.012	0.08 U	2	
127-18-4	Tetrachloroethene	7.6	0.075	0.54	1.1	0.011	0.08	2	
156-60-5	trans-1,2-Dichloroethene	230	0.19	1.6	58	0.049	0.4	10	
79-01-6	Trichloroethene	0.11 J	0.042	0.43	0.020 J	0.0078	0.08	2	✓
75-01-4	Vinyl Chloride	ND	0.046	0.20 U	ND	0.018	0.08 U	2	

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07/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16070362

Sample Identification: GRPCE-08-1A-
 Lab Number: 004A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -7.8 psig
 Final Pressure: -1.3 psig
 Canister ID: 14547

Date Sampled: 7/6/2016
 Date Received: 7/7/2016
 Analysis Date: 7/7/2016
 Analyst: JTF

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.31 U	ND	0.012	0.079 U	1.98	
127-18-4	Tetrachloroethene	2.3	0.068	0.54	0.34	0.01	0.079	1.98	
156-60-5	trans-1,2-Dichloroethene	14	0.038	0.31	3.4	0.0097	0.079	1.98	
79-01-6	Trichloroethene	ND	0.041	0.42 U	ND	0.0077	0.079 U	1.98	
75-01-4	Vinyl Chloride	ND	0.043	0.20 U	ND	0.017	0.079 U	1.98	

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07/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-09-IA- [REDACTED] (1)

Date Sampled: 7/6/2016

Lab Number: 001A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -7.8 psig

Final Pressure: -1.3 psig

Canister ID: 13939

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.24 J	0.048	0.32	0.060 J	0.012	0.08	1.99	se
127-18-4	Tetrachloroethene	2.0	0.075	0.54	0.30	0.011	0.08	1.99	
156-60-5	trans-1,2-Dichloroethene	5.8	0.039	0.32	1.5	0.0098	0.08	1.99	
79-01-6	Trichloroethene	0.43 J	0.042	0.43	0.080 J	0.0078	0.08	1.99	se
75-01-4	Vinyl Chloride	ND	0.046	0.20 U	ND	0.018	0.08 U	1.99	

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07/15/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-09-IA- [REDACTED] (1)-DP

Date Sampled: 7/6/2016

Lab Number: 002A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -8 psig

Final Pressure: -1.7 psig

Canister ID: 14013

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.31	ND	0.012	0.079	1.98	
127-18-4	Tetrachloroethene	1.9	0.068	0.54	0.28	0.01	0.079	1.98	
156-60-5	trans-1,2-Dichloroethene	6.6	0.038	0.31	1.7	0.0097	0.079	1.98	
79-01-6	Trichloroethene	0.11	0.041	0.42	0.020	0.0077	0.079	1.98	J
75-01-4	Vinyl Chloride	ND	0.043	0.20	ND	0.017	0.079	1.98	

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07/15/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-09-IA [redacted] (2)

Date Sampled: 7/6/2016

Lab Number: 003A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/7/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -7.8 psig

Final Pressure: -1.3 psig

Canister ID: 14623

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.31 U	ND	0.012	0.079 U	1.98	
127-18-4	Tetrachloroethene	2.0	0.068	0.54	0.30	0.01	0.079	1.98	
156-60-5	trans-1,2-Dichloroethene	3.0	0.038	0.31	0.75	0.0097	0.079	1.98	
79-01-6	Trichloroethene	ND	0.041	0.42 U	ND	0.0077	0.079 U	1.98	
75-01-4	Vinyl Chloride	ND	0.043	0.20 U	ND	0.017	0.079 U	1.98	

gaw
07/15/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070362

Sample Identification GRPCE-12-OA [REDACTED]

Date Sampled: 7/6/2016

Lab Number: 008A

Date Received: 7/7/2016

Sample Type: Air, Can

Analysis Date: 7/8/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -6.8 psig

Final Pressure: 0.7 psig

Canister ID: 13931

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.048	0.31 U	ND	0.012	0.079 U	1.98	
127-18-4	Tetrachloroethene	1.1	0.068	0.54	0.16	0.01	0.079 U	1.98	
156-60-5	trans-1,2-Dichloroethene	ND	0.038	0.31 U	ND	0.0097	0.079 U	1.98	
79-01-6	Trichloroethene	0.11 J	0.041	0.42	0.020 J	0.0077	0.079	1.98	se
75-01-4	Vinyl Chloride	ND	0.043	0.20 U	ND	0.017	0.079 U	1.98	

gaw
07/15/16

General Notes and Qualifiers:

—, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



July 18, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0951**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for seven air samples collected at the Grand Rapids VI ER site. The samples were collected July 8 and 9, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 18, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
SDG 16070541**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0951	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 18 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 18, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16070541	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	Sample GRPCE-13-0A-█ was incorrectly logged in as GRPCE-13-0A-█ by the laboratory. The sample identifier was manually corrected in the attachment to this checklist.

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Sample GRPCE-09-IA- [REDACTED] (BASEMENT) was analyzed at a 5-fold dilution for trans-1,2-dichloroethene.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070541
 Sample Identification GRPCE-01-IA-CONEXHS20 Date Sampled: 7/9/2016
 Lab Number: 007A Date Received: 7/11/2016
 Sample Type: Air, Can Analysis Date: 7/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.72 psig
 Final Pressure: -1.72 psig
 Canister ID: 14205

C.A.S #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.068 S	0.036	0.27	0.010 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 S	0.019	0.16	0.010 J	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 S	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND, Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070541
 Sample Identification GRPCE-09-IA- [REDACTED] (BASEMENT) Date Sampled: 7/8/2016
 Lab Number: 005A Date Received: 7/11/2016
 Sample Type: Air, Can Analysis Date: 7/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.27 psig
 Final Pressure: -2.27 psig
 Canister ID: 14545

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.12 J	0.024	0.16	0.030 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	6.0	0.036	0.27	0.88	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	240	0.099	0.79	61	0.025	0.2	5	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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07/18/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070541
 Sample Identification GRPCE-09-IA- [REDACTED] (MAIN) Date Sampled: 7/8/2016
 Lab Number: 004A Date Received: 7/11/2016
 Sample Type: Air, Can Analysis Date: 7/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.56 psig
 Final Pressure: -1.56 psig
 Canister ID: 14119

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	2.1	0.036	0.27	0.31	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.7	0.019	0.16	1.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070541
 Sample Identification GRPCE-09-IA [REDACTED] (MAIN) Date Sampled: 7/8/2016
 Lab Number: 003A Date Received: 7/11/2016
 Sample Type: Air, Can Analysis Date: 7/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.9 psig
 Final Pressure: -1.9 psig
 Canister ID: 14072

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	4.3	0.036	0.27	0.64	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	28	0.019	0.16	7.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070541

Sample Identification GRPCE-10-IA-XXXXXXXXXX (1)

Date Sampled: 7/8/2016

Lab Number: 001A

Date Received: 7/11/2016

Sample Type: Air, Can

Analysis Date: 7/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.71 psig

Final Pressure: -1.71 psig

Canister ID: 14015

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	2.6	0.036	0.27	0.38	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.9	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070541
 Sample Identification GRPCE-10-IA- [REDACTED] (2) Date Sampled: 7/8/2016
 Lab Number: 002A Date Received: 7/11/2016
 Sample Type: Air, Can Analysis Date: 7/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.94 psig
 Final Pressure: -1.94 psig
 Canister ID: 14620

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	je
127-18-4	Tetrachloroethene	4.7	0.036	0.27	0.70	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	16	0.019	0.16	4.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16070541

Sample Identification: GRPCE-13-9A [redacted] *gaw*
 Lab Number: 006A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.19 psig
 Final Pressure: -2.19 psig
 Canister ID: 14049
 Date Sampled: 7/8/2016
 Date Received: 7/11/2016
 Analysis Date: 7/12/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079 S	0.019	0.16	0.020 J	0.0049	0.04	1	JE
79-01-6	Trichloroethene	0.054 S	0.021	0.21	0.010 J	0.0039	0.04	1	JE
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/18/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



July 19, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0954**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for twenty air samples (including three field duplicates) collected at the Grand Rapids VI ER site. The samples were collected July 11 through 14, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 18, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
SDGS 16070647 AND 16070786**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0954A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 19, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16070647		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Twelve air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-02-IA- [REDACTED] GRPCE-02-IA- [REDACTED] DP and GRPCE-10-IA- [REDACTED] GRPCE-10-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	<p>The individual canister certification for sample GRPCE-01-BAG01 contained tetrachloroethene at 0.14 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) / 0.020 parts per billion volume (ppbV). No qualification was required because the associated results were greater than ten times the canister certification value.</p> <p>The individual canister certification for sample GRPCE-10-IA- [REDACTED] contained trichloroethene at 0.054 $\mu\text{g}/\text{m}^3$ / 0.010 ppbV. The associated results were qualified as estimated with a possible high bias (J+).</p>



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Samples GRPCE-10-IA-[REDACTED] and GRPCE-10-IA-[REDACTED] were analyzed at 5-fold dilutions for trans-1,2-dichloroethene.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070647

Sample Identification: GRPCE-01-BAG01

Date Sampled: 7/11/2016

Lab Number: 002A

Date Received: 7/12/2016

Sample Type: Air, Can

Analysis Date: 7/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.37 psig

Final Pressure: -2.37 psig

Canister ID: 14586

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.12 J	0.024	0.16	0.030 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	82	0.036	0.27	12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	22	0.019	0.16	5.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.43	0.021	0.21	0.080	0.0039	0.04	1	
75-01-4	Vinyl Chloride	0.15	0.022	0.10	0.060	0.0088	0.04	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070647

Sample Identification GRPCE-01-TABLE01

Date Sampled: 7/11/2016

Lab Number: 001A

Date Received: 7/12/2016

Sample Type: Air, Can

Analysis Date: 7/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.4 psig

Final Pressure: -1.4 psig

Canister ID: 14031

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	+
127-18-4	Tetrachloroethene	51	0.036	0.27	7.5	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	52	0.019	0.16	13	0.0049	0.04	1	
79-01-6	Trichloroethene	0.70	0.021	0.21	0.13	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-02-IA- [REDACTED] Date Sampled: 7/12/2016
 Lab Number: 003A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.86 psig
 Final Pressure: -1.86 psig
 Canister ID: 14039

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	JE
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	JE
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-02-1A-██████████ DP Date Sampled: 7/12/2016
 Lab Number: 004A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.97 psig
 Final Pressure: -1.97 psig
 Canister ID: 14576

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification: GRPCE-10-1A [REDACTED] Date Sampled: 7/12/2016
 Lab Number: 011A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -0.96 psig
 Final Pressure: -0.96 psig
 Canister ID: 13929

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	se
127-18-4	Tetrachloroethene	3.9	0.036	0.27	0.57	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	160	0.099	0.79	41	0.025	0.2	5	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 J	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-10-1A [REDACTED] Date Sampled: 7/12/2016
 Lab Number: 009A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.66 psig
 Final Pressure: -1.66 psig
 Canister ID: 14572

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.4	0.019	0.16	1.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-10-IA (MAIN)-DP Date Sampled: 7/12/2016
 Lab Number: 010A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.72 psig
 Final Pressure: -1.72 psig
 Canister ID: 14628

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.4	0.019	0.16	1.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070647

Sample Identification GRPCE-10-IA- [REDACTED]

Date Sampled: 7/12/2016

Lab Number: 008A

Date Received: 7/12/2016

Sample Type: Air, Can

Analysis Date: 7/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.24 psig

Final Pressure: -2.24 psig

Canister ID: 14474

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethenc	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	9.2	0.036	0.27	1.4	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethenc	230	0.099	0.79	59	0.025	0.2	5	
79-01-6	Trichloroethene	0.21 J	0.021	0.21	0.040 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

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General Notes and Qualifiers:

—: Information not available or not applicable
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070647

Sample Identification GRPCE-10-IA-1 (MAIN)

Date Sampled: 7/12/2016

Lab Number: 007A

Date Received: 7/12/2016

Sample Type: Air, Can

Analysis Date: 7/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.87 psig

Final Pressure: -1.87 psig

Canister ID: 14131

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	4.4	0.036	0.27	0.65	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	52	0.019	0.16	13	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-11-IA (1) Date Sampled: 7/12/2016
 Lab Number: 005A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.94 psig
 Final Pressure: -2.94 psig
 Canister ID: 14471

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.6	0.036	0.27	0.23	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.0	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	se
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-11-IA [REDACTED] (2) Date Sampled: 7/12/2016
 Lab Number: 006A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.79 psig
 Final Pressure: -1.79 psig
 Canister ID: 14297

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.9	0.019	0.16	0.49	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit
 B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 14-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070647
 Sample Identification GRPCE-14-OA-XXXXXXXXXX Date Sampled: 7/12/2016
 Lab Number: 012A Date Received: 7/12/2016
 Sample Type: Air, Can Analysis Date: 7/13/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.27 psig
 Final Pressure: -2.27 psig
 Canister ID: 14036

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RI (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	je
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0954B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 19, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16070786		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-11-IA- [REDACTED] GRPCE-11-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Sample GRPCE-11-IA- [REDACTED] was analyzed at a 20-fold dilution for trans-1,2-dichloroethene. Sample GRPCE-11-IA- [REDACTED] was analyzed at a 10-fold dilution for trans-1,2-dichloroethene.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-11-IA [REDACTED]
 Lab Number: 007A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.8 psig
 Final Pressure: -2.8 psig
 Canister ID: 14397

Date Sampled: 7/14/2016
 Date Received: 7/14/2016
 Analysis Date: 7/15/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.20	0.024	0.16	0.050	0.0061	0.04	1	
127-18-4	Tetrachloroethene	5.8	0.036	0.27	0.85	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	520	0.39	3.2	130	0.098	0.8	20	
79-01-6	Trichloroethene	0.43	0.021	0.21	0.080	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	ND	0.0088	0.04	U

gaw
07/19/16

General Notes and Qualifiers: --; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-11-IA [REDACTED]

Date Sampled: 7/14/2016

Lab Number: 006A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.92 psig

Final Pressure: -1.92 psig

Canister ID: 13998

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	14	0.019	0.16	3.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-11-IA [REDACTED]
 Lab Number: 005A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.09 psig
 Final Pressure: -2.09 psig
 Canister ID: 14032

Date Sampled: 7/14/2016
 Date Received: 7/14/2016
 Analysis Date: 7/15/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	JR
127-18-4	Tetrachloroethene	13	0.036	0.27	1.9	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	250	0.19	1.6	63	0.049	0.4	10	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-11-IA [REDACTED]

Date Sampled: 7/14/2016

Lab Number: 003A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.6 psig

Final Pressure: -2.6 psig

Canister ID: 14014

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	5.3	0.036	0.27	0.78	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	44	0.019	0.16	11	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-11-IA [REDACTED] DP

Date Sampled: 7/14/2016

Lab Number: 004A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.8 psig

Final Pressure: -2.8 psig

Canister ID: 14338

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	4.9	0.036	0.27	0.72	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	40	0.019	0.16	10	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-12-IA [REDACTED] (1)

Date Sampled: 7/14/2016

Lab Number: 001A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.28 psig

Final Pressure: -3.28 psig

Canister ID: 13927

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.21	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.7	0.019	0.16	0.42	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-12-IA [redacted] (2)

Date Sampled: 7/14/2016

Lab Number: 002A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.38 psig

Final Pressure: -2.38 psig

Canister ID: 14590

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	3.6	0.036	0.27	0.53	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.2	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16070786

Sample Identification GRPCE-15-OA [REDACTED]

Date Sampled: 7/14/2016

Lab Number: 008A

Date Received: 7/14/2016

Sample Type: Air, Can

Analysis Date: 7/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.21 psig

Final Pressure: -2.21 psig

Canister ID: 14617

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.16	0.019	0.16	0.040	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/19/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



July 26, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0967**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for one air sample collected at the Grand Rapids VI ER site. The sample was collected July 15, 2016 and was analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 25, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

DATA VALIDATION REPORTS
SDGS 16070940

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0967	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 26 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 26, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16070940	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	One air sample	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 18-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16070940
 Sample Identification GRPCE-03-IA- [REDACTED] Date Sampled: 7/15/2016
 Lab Number: 001A Date Received: 7/16/2016
 Sample Type: Air, Can Analysis Date: 7/16/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -2.41 psig
 Final Pressure: -2.41 psig
 Canister ID: 14400

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16 U	ND	0.0049	0.04 U	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/26/16

General Notes and Qualifiers:

-: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL, Method Detection Limit
 B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



July 28, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0972**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for seventeen air samples (including three field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on July 19 and 20, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on July 27, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
SDGS 16071052 AND 16071159**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0972A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 28 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 28, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16071052	Analyses	
		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		Nine air samples (including two field duplicates)	
Field Duplicate Pairs		GRPCE-12-IA- [REDACTED] (BASEMENT)/GRPCE-12-IA- [REDACTED] (BASEMENT)-DP and GRPCE-13-IA- [REDACTED] 2)/GRPCE-13-IA- [REDACTED] 2)-DP	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Samples GRPCE-12-IA- [REDACTED] (BASEMENT), GRPCE-12-IA- [REDACTED] (BASEMENT)-DP, and GRPCE-12-IA- [REDACTED] were analyzed at 10-fold dilutions for trans-1,2-dichloroethene.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-12-IA- [REDACTED] (BASEMENT) Date Sampled: 7/19/2016
 Lab Number: 007A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -2.02 psig
 Final Pressure: -2.02 psig
 Canister ID: 13987

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	5.0	0.036	0.27	0.74	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	220	0.19	1.6	55	0.049	0.4	10	
79-01-6	Trichloroethene	0.48	0.021	0.21	0.090	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-12-1A- [REDACTED] (BASEMENT)-DP Date Sampled: 7/19/2016
 Lab Number: 008A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -3.21 psig
 Final Pressure: -3.21 psig
 Canister ID: 14290

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	5.4	0.036	0.27	0.80	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	250	0.19	1.6	64	0.049	0.4	10	
79-01-6	Trichloroethene	0.43	0.021	0.21	0.080	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16071052

Sample Identification GRPCE-12-IA- [REDACTED] (MAIN) Date Sampled: 7/19/2016
 Lab Number: 006A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -2.18 psig
 Final Pressure: -2.18 psig
 Canister ID: 13946

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.8	0.036	0.27	0.27	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	23	0.019	0.16	5.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.27	0.021	0.21	0.050	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-12-IA [REDACTED] Date Sampled: 7/19/2016
 Lab Number: 005A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -2.02 psig
 Final Pressure: -2.02 psig
 Canister ID: 14570

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	9.1	0.036	0.27	1.3	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	200	0.19	1.6	50	0.049	0.4	10	
79-01-6	Trichloroethene	0.27	0.021	0.21	0.050	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-12-IA-██████████ Date Sampled: 7/19/2016
 Lab Number: 004A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.56 psig
 Final Pressure: -1.56 psig
 Canister ID: 14591

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	3.5	0.036	0.27	0.52	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	22	0.019	0.16	5.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-13-IA (1) Date Sampled: 7/19/2016
 Lab Number: 001A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.71 psig
 Final Pressure: -1.71 psig
 Canister ID: 14396

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.9	0.036	0.27	0.28	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	11	0.019	0.16	2.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071052
 Sample Identification GRPCE-13-IA [REDACTED] (2) Date Sampled: 7/19/2016
 Lab Number: 002A Date Received: 7/19/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.70 psig
 Final Pressure: -1.70 psig
 Canister ID: 14002

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	3.3	0.036	0.27	0.48	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	13	0.019	0.16	3.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071052

Sample Identification GRPCE-13-IA [REDACTED] (2)-DP

Date Sampled: 7/19/2016

Lab Number: 003A

Date Received: 7/19/2016

Sample Type: Air, Can

Analysis Date: 7/20/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.99 psig

Final Pressure: -2.99 psig

Canister ID: 14472

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	2.8	0.036	0.27	0.41	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	11	0.019	0.16	2.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL: Report Limit

J: Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071052

Sample Identification GRPCE-16-OA [REDACTED]

Date Sampled: 7/19/2016

Lab Number: 009A

Date Received: 7/19/2016

Sample Type: Air, Can

Analysis Date: 7/20/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.77 psig

Final Pressure: -1.77 psig

Canister ID: 14403

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12 J	0.019	0.16	0.030 J	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0972B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 28 July 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 28, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16071159	Analyses	
Analyses		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		Eight air samples (including a field duplicate)	
Field Duplicate Pairs		GRPCE-13-IA- [REDACTED] GRPCE-13-IA- [REDACTED] DP	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	The individual canister certification for sample GRPCE-17-OA- [REDACTED] contained cis-1,2-dichloroethene at 0.040 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) / 0.010 parts per billion volume (ppbV) and tetrachloroethene at $0.068 \mu\text{g}/\text{m}^3$ / 0.010 ppbV. The tetrachloroethene result was qualified as estimated with a possible high bias (J+), and the cis-1,2-dichloroethene result was raised to the reporting limit and qualified as non-detect (U).



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-13-IA-██████████ (BASEMENT) Date Sampled: 7/20/2016
 Lab Number: 007A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/21/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.90 psig
 Final Pressure: -1.90 psig
 Canister ID: 14621

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		
127-18-4	Tetrachloroethene	2.8	0.036	0.27	0.41	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	46	0.019	0.16	12	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: **TETRA TECH**
 Project: **GRAND RAPIDS EMERGENCY RESPONSE** Work Order No: **16071159**
 Sample Identification: **GRPCE-13-IA- [REDACTED] (MAIN)** Date Sampled: **7/20/2016**
 Lab Number: **006A** Date Received: **7/20/2016**
 Sample Type: **Air, Can** Analysis Date: **7/20/2016**
 Test Method: **EPA Method TO-15A** Analyst: **JTF**
 Initial Pressure: **-2.41 psig**
 Final Pressure: **-2.41 psig**
 Canister ID: **14536**

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	2.2	0.036	0.27	0.32	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	23	0.019	0.16	5.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	ER
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/28/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071159

Sample Identification GRPCE-13-IA [REDACTED]

Date Sampled: 7/20/2016

Lab Number: 004A

Date Received: 7/20/2016

Sample Type: Air, Can

Analysis Date: 7/21/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.19 psig

Final Pressure: -2.19 psig

Canister ID: 14139

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	3.1	0.036	0.27	0.46	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	47	0.019	0.16	12	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
07/28/16

General Notes and Qualifiers:

-: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-13-1A [REDACTED] DP Date Sampled: 7/20/2016
 Lab Number: 005A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/21/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -2.63 psig
 Final Pressure: -2.63 psig
 Canister ID: 14469

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual	
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	U	NT	0.0061	0.04	U	1
127-18-4	Tetrachloroethene	3.3	0.036	0.27	0.49	0.0053	0.04			1
156-60-5	trans-1,2-Dichloroethene	47	0.019	0.16	12	0.0049	0.04			1
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04			1
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	NT	0.0088	0.04	U	1

gaw
07/28/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-13-IA [REDACTED] Date Sampled: 7/20/2016
 Lab Number: 003A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.93 psig
 Final Pressure: -1.93 psig
 Canister ID: 14538

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.9	0.036	0.27	0.28	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	16	0.019	0.16	4.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/28/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-14-IA (1) Date Sampled: 7/20/2016
 Lab Number: 001A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.6 psig
 Final Pressure: -1.60 psig
 Canister ID: 14298

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.8	0.036	0.27	0.27	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.7	0.019	0.16	0.44	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/28/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-14-IA [REDACTED] (2) Date Sampled: 7/20/2016
 Lab Number: 002A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/20/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.99 psig
 Final Pressure: -1.99 psig
 Canister ID: 13996

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	3.6	0.036	0.27	0.53	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	9.0	0.019	0.16	2.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	+
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
07/28/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071159
 Sample Identification GRPCE-17-OA [REDACTED] Date Sampled: 7/20/2016
 Lab Number: 008A Date Received: 7/20/2016
 Sample Type: Air, Can Analysis Date: 7/21/2016
 Test Method: EPA Method TO-15A Analyst: JTF
 Initial Pressure: -1.65 psig
 Final Pressure: -1.65 psig
 Canister ID: 14000

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079	0.024	0.16	0.020	0.0061	0.04	1	+
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
07/28/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



August 1, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0974**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for sixteen air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on July 5, 15, and 19, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics. Tetra Tech received the last of the data on July 26, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
EUROFINS-AIR TOXICS SDGS 1607107, 1607264, AND 1607335**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0974A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 1 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 28, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1607107	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Three air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.71x: GRPCE-01-IA-[REDACTED] (BASEMENT) 1.79x: GRPCE-01-IA-[REDACTED] (MAIN) 1.75x: GRPCE-01-IA-[REDACTED] (BASEMENT)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607107

CLIENTSAMPID		SAMPDATETIME	COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Vinyl Chloride		ND	0.17	PPBV	0.17	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	trans-1,2-Dichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	cis-1,2-Dichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Trichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Tetrachloroethene	0.79		0.17	PPBV	0.79	
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Vinyl Chloride		ND	0.44	UG/M3	0.44	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	trans-1,2-Dichloroethene		ND	0.68	UG/M3	0.68	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	cis-1,2-Dichloroethene		ND	0.68	UG/M3	0.68	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Trichloroethene		ND	0.92	UG/M3	0.92	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:42	Tetrachloroethene	5.3		1.2	UG/M3	5.3	
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Vinyl Chloride		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	trans-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	cis-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Trichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Tetrachloroethene	1.2		0.18	PPBV	1.2	
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Vinyl Chloride		ND	0.46	UG/M3	0.46	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	trans-1,2-Dichloroethene		ND	0.71	UG/M3	0.71	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	cis-1,2-Dichloroethene		ND	0.71	UG/M3	0.71	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Trichloroethene		ND	0.96	UG/M3	0.96	U
GRPCE-01-IA-		(MAIN) 07/06/2016 16:37	Tetrachloroethene	8.5		1.2	UG/M3	8.5	
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Vinyl Chloride		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	trans-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	cis-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Trichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Tetrachloroethene	7.6		0.18	PPBV	7.6	
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Vinyl Chloride		ND	0.45	UG/M3	0.45	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	trans-1,2-Dichloroethene		ND	0.69	UG/M3	0.69	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	cis-1,2-Dichloroethene		ND	0.69	UG/M3	0.69	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Trichloroethene		ND	0.94	UG/M3	0.94	U
GRPCE-01-IA-		(BASEMENT) 07/06/2016 16:39	Tetrachloroethene	52		1.2	UG/M3	52	

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0974B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 1 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 29, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1607264	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Two air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.74x: GRPCE-02-IA- [REDACTED] (MAIN) 1.78x: GRPCE-02-IA- [REDACTED] (Basement)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit were qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607264

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-	(Basement) Vinyl Chloride			ND	0.18 PPBV	0.18	U
GRPCE-02-IA-	(Basement) trans-1,2-Dichloroethene			ND	0.18 PPBV	0.18	U
GRPCE-02-IA-	(Basement) cis-1,2-Dichloroethene	0.055	J		0.18 PPBV	0.055	J
GRPCE-02-IA-	(Basement) Trichloroethene			ND	0.18 PPBV	0.18	U
GRPCE-02-IA-	(Basement) Tetrachloroethene	1.0			0.18 PPBV	1.0	
GRPCE-02-IA-	(Basement) Vinyl Chloride			ND	0.46 UG/M3	0.46	U
GRPCE-02-IA-	(Basement) trans-1,2-Dichloroethene			ND	0.70 UG/M3	0.70	U
GRPCE-02-IA-	(Basement) cis-1,2-Dichloroethene	0.22	J		0.70 UG/M3	0.22	J
GRPCE-02-IA-	(Basement) Trichloroethene			ND	0.96 UG/M3	0.96	U
GRPCE-02-IA-	(Basement) Tetrachloroethene	7.1			1.2 UG/M3	7.1	
GRPCE-02-IA-	(MAIN) Vinyl Chloride			ND	0.17 PPBV	0.17	U
GRPCE-02-IA-	(MAIN) trans-1,2-Dichloroethene			ND	0.17 PPBV	0.17	U
GRPCE-02-IA-	(MAIN) cis-1,2-Dichloroethene			ND	0.17 PPBV	0.17	U
GRPCE-02-IA-	(MAIN) Trichloroethene	0.10	J		0.17 PPBV	0.10	J
GRPCE-02-IA-	(MAIN) Tetrachloroethene	0.34			0.17 PPBV	0.34	
GRPCE-02-IA-	(MAIN) Vinyl Chloride			ND	0.44 UG/M3	0.44	U
GRPCE-02-IA-	(MAIN) trans-1,2-Dichloroethene			ND	0.69 UG/M3	0.69	U
GRPCE-02-IA-	(MAIN) cis-1,2-Dichloroethene			ND	0.69 UG/M3	0.69	U
GRPCE-02-IA-	(MAIN) Trichloroethene	0.54	J		0.94 UG/M3	0.54	J
GRPCE-02-IA-	(MAIN) Tetrachloroethene	2.3			1.2 UG/M3	2.3	

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0974C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 1 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> July 29, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1607335	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eleven air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-02-IA- [REDACTED] (Basement-W)/GRPCE-02-IA- [REDACTED] (Basement-W)-DP and GRPCE-02-IA- [REDACTED] (Main-Conf.)/GRPCE-02-IA- [REDACTED] (Main-Conf.)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.58x: GRPCE-02-IA-[redacted] (Basement-S), GRPCE-02-IA-[redacted] (Main-Common), and GRPCE-02-IA-[redacted] (Main-SFR) 1.64x: GRPCE-02-IA-[redacted] (Basement-W)-DP, GRPCE-02-IA-[redacted] (Main-Conf.), and GRPCE-02-IA-[redacted] (Main-Conf.)-DP 1.68x: GRPCE-02-IA-[redacted] (2 nd -N) 1.75x: GRPCE-02-IA-[redacted] (Basement-W) 2.06x: GRPCE-02-IA-[redacted] (2 nd -W) 1.87x: GRPCE-02-IA-[redacted] (2 nd -S) 2.17x: GRPCE-02-IA-[redacted] (Basement-N)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit were qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607335

CLIENTSAMPID		COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-	(2nd-N)	Vinyl Chloride		ND	0.17	PPBV	0.17	U
GRPCE-02-IA-	(2nd-N)	trans-1,2-Dichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-02-IA-	(2nd-N)	cis-1,2-Dichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-02-IA-	(2nd-N)	Trichloroethene		ND	0.17	PPBV	0.17	U
GRPCE-02-IA-	(2nd-N)	Tetrachloroethene	1.4		0.17	PPBV	1.4	
GRPCE-02-IA-	(2nd-N)	Vinyl Chloride		ND	0.43	UG/M3	0.43	U
GRPCE-02-IA-	(2nd-N)	trans-1,2-Dichloroethene		ND	0.67	UG/M3	0.67	U
GRPCE-02-IA-	(2nd-N)	cis-1,2-Dichloroethene		ND	0.67	UG/M3	0.67	U
GRPCE-02-IA-	(2nd-N)	Trichloroethene		ND	0.90	UG/M3	0.90	U
GRPCE-02-IA-	(2nd-N)	Tetrachloroethene	9.4		1.1	UG/M3	9.4	
GRPCE-02-IA-	(2nd-S)	Vinyl Chloride		ND	0.19	PPBV	0.19	U
GRPCE-02-IA-	(2nd-S)	trans-1,2-Dichloroethene		ND	0.19	PPBV	0.19	U
GRPCE-02-IA-	(2nd-S)	cis-1,2-Dichloroethene		ND	0.19	PPBV	0.19	U
GRPCE-02-IA-	(2nd-S)	Trichloroethene		ND	0.19	PPBV	0.19	U
GRPCE-02-IA-	(2nd-S)	Tetrachloroethene	1.5		0.19	PPBV	1.5	
GRPCE-02-IA-	(2nd-S)	Vinyl Chloride		ND	0.48	UG/M3	0.48	U
GRPCE-02-IA-	(2nd-S)	trans-1,2-Dichloroethene		ND	0.74	UG/M3	0.74	U
GRPCE-02-IA-	(2nd-S)	cis-1,2-Dichloroethene		ND	0.74	UG/M3	0.74	U
GRPCE-02-IA-	(2nd-S)	Trichloroethene		ND	1.0	UG/M3	1.0	U
GRPCE-02-IA-	(2nd-S)	Tetrachloroethene	10		1.3	UG/M3	10	
GRPCE-02-IA-	(2nd-W)	Vinyl Chloride		ND	0.21	PPBV	0.21	U
GRPCE-02-IA-	(2nd-W)	trans-1,2-Dichloroethene		ND	0.21	PPBV	0.21	U
GRPCE-02-IA-	(2nd-W)	cis-1,2-Dichloroethene		ND	0.21	PPBV	0.21	U
GRPCE-02-IA-	(2nd-W)	Trichloroethene		ND	0.21	PPBV	0.21	U
GRPCE-02-IA-	(2nd-W)	Tetrachloroethene	1.1		0.21	PPBV	1.1	
GRPCE-02-IA-	(2nd-W)	Vinyl Chloride		ND	0.53	UG/M3	0.53	U
GRPCE-02-IA-	(2nd-W)	trans-1,2-Dichloroethene		ND	0.82	UG/M3	0.82	U
GRPCE-02-IA-	(2nd-W)	cis-1,2-Dichloroethene		ND	0.82	UG/M3	0.82	U
GRPCE-02-IA-	(2nd-W)	Trichloroethene		ND	1.1	UG/M3	1.1	U
GRPCE-02-IA-	(2nd-W)	Tetrachloroethene	7.7		1.4	UG/M3	7.7	
GRPCE-02-IA-	(Main-Conf.)	Vinyl Chloride		ND	0.16	PPBV	0.16	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607335

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-	(Main-Conf.) trans-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Conf.) cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Conf.) Trichloroethene	0.060	J	0.16	PPBV	0.060	J
GRPCE-02-IA-	(Main-Conf.) Tetrachloroethene	9.2		0.16	PPBV	9.2	
GRPCE-02-IA-	(Main-Conf.) Vinyl Chloride		ND	0.42	UG/M3	0.42	U
GRPCE-02-IA-	(Main-Conf.) trans-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Main-Conf.) cis-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Main-Conf.) Trichloroethene	0.32	J	0.88	UG/M3	0.32	J
GRPCE-02-IA-	(Main-Conf.) Tetrachloroethene	63		1.1	UG/M3	63	
GRPCE-02-IA-	(Main-Conf.)-DP Vinyl Chloride		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Conf.)-DP trans-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Conf.)-DP cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Conf.)-DP Trichloroethene	0.059	J	0.16	PPBV	0.059	J
GRPCE-02-IA-	(Main-Conf.)-DP Tetrachloroethene	8.6		0.16	PPBV	8.6	
GRPCE-02-IA-	(Main-Conf.)-DP Vinyl Chloride		ND	0.42	UG/M3	0.42	U
GRPCE-02-IA-	(Main-Conf.)-DP trans-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Main-Conf.)-DP cis-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Main-Conf.)-DP Trichloroethene	0.32	J	0.88	UG/M3	0.32	J
GRPCE-02-IA-	(Main-Conf.)-DP Tetrachloroethene	58		1.1	UG/M3	58	
GRPCE-02-IA-	(Main-Common) Vinyl Chloride		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Common) trans-1,2-Dichloroethene	0.066	J	0.16	PPBV	0.066	J
GRPCE-02-IA-	(Main-Common) cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-Common) Trichloroethene	0.056	J	0.16	PPBV	0.056	J
GRPCE-02-IA-	(Main-Common) Tetrachloroethene	7.8		0.16	PPBV	7.8	
GRPCE-02-IA-	(Main-Common) Vinyl Chloride		ND	0.40	UG/M3	0.40	U
GRPCE-02-IA-	(Main-Common) trans-1,2-Dichloroethene	0.26	J	0.63	UG/M3	0.26	J
GRPCE-02-IA-	(Main-Common) cis-1,2-Dichloroethene		ND	0.63	UG/M3	0.63	U
GRPCE-02-IA-	(Main-Common) Trichloroethene	0.30	J	0.85	UG/M3	0.30	J
GRPCE-02-IA-	(Main-Common) Tetrachloroethene	53		1.1	UG/M3	53	
GRPCE-02-IA-	(Main-SFR) Vinyl Chloride		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Main-SFR) trans-1,2-Dichloroethene	0.065	J	0.16	PPBV	0.065	J

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607335

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-██████████	(Main-SFR) cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-██████████	(Main-SFR) Trichloroethene	0.22		0.16	PPBV	0.22	
GRPCE-02-IA-██████████	(Main-SFR) Tetrachloroethene	4.9		0.16	PPBV	4.9	
GRPCE-02-IA-██████████	(Main-SFR) Vinyl Chloride		ND	0.40	UG/M3	0.40	U
GRPCE-02-IA-██████████	(Main-SFR) trans-1,2-Dichloroethene	0.26	J	0.63	UG/M3	0.26	J
GRPCE-02-IA-██████████	(Main-SFR) cis-1,2-Dichloroethene		ND	0.63	UG/M3	0.63	U
GRPCE-02-IA-██████████	(Main-SFR) Trichloroethene	1.2		0.85	UG/M3	1.2	
GRPCE-02-IA-██████████	(Main-SFR) Tetrachloroethene	33		1.1	UG/M3	33	
GRPCE-02-IA-██████████	(Basement-S) Vinyl Chloride		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-██████████	(Basement-S) trans-1,2-Dichloroethene	0.092	J	0.16	PPBV	0.092	J
GRPCE-02-IA-██████████	(Basement-S) cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-██████████	(Basement-S) Trichloroethene	0.15	J	0.16	PPBV	0.15	J
GRPCE-02-IA-██████████	(Basement-S) Tetrachloroethene	25		0.16	PPBV	25	
GRPCE-02-IA-██████████	(Basement-S) Vinyl Chloride		ND	0.40	UG/M3	0.40	U
GRPCE-02-IA-██████████	(Basement-S) trans-1,2-Dichloroethene	0.36	J	0.63	UG/M3	0.36	J
GRPCE-02-IA-██████████	(Basement-S) cis-1,2-Dichloroethene		ND	0.63	UG/M3	0.63	U
GRPCE-02-IA-██████████	(Basement-S) Trichloroethene	0.79	J	0.85	UG/M3	0.79	J
GRPCE-02-IA-██████████	(Basement-S) Tetrachloroethene	170		1.1	UG/M3	170	
GRPCE-02-IA-██████████	(Basement-N) Vinyl Chloride		ND	0.22	PPBV	0.22	U
GRPCE-02-IA-██████████	(Basement-N) trans-1,2-Dichloroethene		ND	0.22	PPBV	0.22	U
GRPCE-02-IA-██████████	(Basement-N) cis-1,2-Dichloroethene		ND	0.22	PPBV	0.22	U
GRPCE-02-IA-██████████	(Basement-N) Trichloroethene	0.20	J	0.22	PPBV	0.20	J
GRPCE-02-IA-██████████	(Basement-N) Tetrachloroethene	32		0.22	PPBV	32	
GRPCE-02-IA-██████████	(Basement-N) Vinyl Chloride		ND	0.55	UG/M3	0.55	U
GRPCE-02-IA-██████████	(Basement-N) trans-1,2-Dichloroethene		ND	0.86	UG/M3	0.86	U
GRPCE-02-IA-██████████	(Basement-N) cis-1,2-Dichloroethene		ND	0.86	UG/M3	0.86	U
GRPCE-02-IA-██████████	(Basement-N) Trichloroethene	1.1	J	1.2	UG/M3	1.1	J
GRPCE-02-IA-██████████	(Basement-N) Tetrachloroethene	220		1.5	UG/M3	220	
GRPCE-02-IA-██████████	(Basement-W) Vinyl Chloride		ND	0.18	PPBV	0.18	U
GRPCE-02-IA-██████████	(Basement-W) trans-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U
GRPCE-02-IA-██████████	(Basement-W) cis-1,2-Dichloroethene		ND	0.18	PPBV	0.18	U

ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1607335

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-	(Basement-W) Trichloroethene	0.096	J	0.18	PPBV	0.096	J
GRPCE-02-IA-	(Basement-W) Tetrachloroethene	14		0.18	PPBV	14	
GRPCE-02-IA-	(Basement-W) Vinyl Chloride		ND	0.45	UG/M3	0.45	U
GRPCE-02-IA-	(Basement-W) trans-1,2-Dichloroethene		ND	0.69	UG/M3	0.69	U
GRPCE-02-IA-	(Basement-W) cis-1,2-Dichloroethene		ND	0.69	UG/M3	0.69	U
GRPCE-02-IA-	(Basement-W) Trichloroethene	0.52	J	0.94	UG/M3	0.52	J
GRPCE-02-IA-	(Basement-W) Tetrachloroethene	94		1.2	UG/M3	94	
GRPCE-02-IA-	(Basement-W)-DP Vinyl Chloride		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Basement-W)-DP trans-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Basement-W)-DP cis-1,2-Dichloroethene		ND	0.16	PPBV	0.16	U
GRPCE-02-IA-	(Basement-W)-DP Trichloroethene	0.081	J	0.16	PPBV	0.081	J
GRPCE-02-IA-	(Basement-W)-DP Tetrachloroethene	14		0.16	PPBV	14	
GRPCE-02-IA-	(Basement-W)-DP Vinyl Chloride		ND	0.42	UG/M3	0.42	U
GRPCE-02-IA-	(Basement-W)-DP trans-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Basement-W)-DP cis-1,2-Dichloroethene		ND	0.65	UG/M3	0.65	U
GRPCE-02-IA-	(Basement-W)-DP Trichloroethene	0.43	J	0.88	UG/M3	0.43	J
GRPCE-02-IA-	(Basement-W)-DP Tetrachloroethene	95		1.1	UG/M3	95	



August 3, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 0989**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for five air samples collected at the Grand Rapids VI ER site. The samples were collected on July 27, 2016 and were analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the data on August 2, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the exceedances discussed in this validation.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
ALS SDG P1603725**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	0989	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 3 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 3, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603725		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Five air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
N	The percent relative standard deviation exceeded the acceptance criterion for trans-1,2-dichloroethene; therefore, the associated results were qualified as estimated (J for detects and UJ for non-detects).

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.34x: VOCs except tetrachloroethene for GRPCE-01-IA- [REDACTED] (Basement-Storage Rm) 1.37x: VOCs for GRPCE-03-IA- [REDACTED] (2 nd Floor-S) 1.55x: VOCs except tetrachloroethene for GRPCE-03-IA- [REDACTED] (Basement-N) 1.66x: VOCs for GRPCE-03-IA- [REDACTED] (Basement) 1.68x: VOCs for GRPCE-03-IA- [REDACTED] (Main) 13.4x: tetrachloroethene for GRPCE-01-IA- [REDACTED] (Basement-Storage Rm) 15.5x: tetrachloroethene for GRPCE-03-IA- [REDACTED] (Basement-N)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY

ALS REPORT NO. P1603725

Samp_No	Analyte	Result	Result_Qual	MDL	RL	Units	Val_Result	Val_Qual
GRPCE-01-IA-	(Basement-Storage Rm) cis-1,2-Dichloroethene	0.046		0.031	0.034	ppbV	0.046	
GRPCE-01-IA-	(Basement-Storage Rm) Tetrachloroethene	42	D	0.14	0.2	ppbV	42	
GRPCE-01-IA-	(Basement-Storage Rm) trans-1,2-Dichloroethene	0.068		0.031	0.034	ppbV	0.068	J
GRPCE-01-IA-	(Basement-Storage Rm) Trichloroethene (TCE)	0.23		0.022	0.025	ppbV	0.23	
GRPCE-01-IA-	(Basement-Storage Rm) Vinyl Chloride	0.052	U	0.05	0.052	ppbV	0.052	U
GRPCE-01-IA-	(Basement-Storage Rm) cis-1,2-Dichloroethene	0.18		0.12	0.13	ug/m3	0.18	
GRPCE-01-IA-	(Basement-Storage Rm) Tetrachloroethene	280	D	0.96	1.3	ug/m3	280	
GRPCE-01-IA-	(Basement-Storage Rm) trans-1,2-Dichloroethene	0.27		0.12	0.13	ug/m3	0.27	J
GRPCE-01-IA-	(Basement-Storage Rm) Trichloroethene (TCE)	1.2		0.12	0.13	ug/m3	1.2	
GRPCE-01-IA-	(Basement-Storage Rm) Vinyl Chloride	0.13	U	0.13	0.13	ug/m3	0.13	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene	0.042	U	0.039	0.042	ppbV	0.042	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	0.32		0.018	0.024	ppbV	0.32	
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	UJ
GRPCE-03-IA-	(Basement) Trichloroethene (TCE)	0.031	U	0.028	0.031	ppbV	0.031	U
GRPCE-03-IA-	(Basement) Vinyl Chloride	0.065	U	0.062	0.065	ppbV	0.065	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	2.2		0.12	0.17	ug/m3	2.2	
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	UJ
GRPCE-03-IA-	(Basement) Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(Basement) Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene	0.042	U	0.039	0.042	ppbV	0.042	U
GRPCE-03-IA-	(Main) Tetrachloroethene	0.07		0.018	0.025	ppbV	0.07	
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene	0.047		0.039	0.042	ppbV	0.047	J
GRPCE-03-IA-	(Main) Trichloroethene (TCE)	0.031	U	0.028	0.031	ppbV	0.031	U
GRPCE-03-IA-	(Main) Vinyl Chloride	0.066	U	0.062	0.066	ppbV	0.066	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(Main) Tetrachloroethene	0.47		0.12	0.17	ug/m3	0.47	
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene	0.19		0.15	0.17	ug/m3	0.19	J
GRPCE-03-IA-	(Main) Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(Main) Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-03-IA-	(2nd Floor -S) cis-1,2-Dichloroethene	0.035	U	0.032	0.035	ppbV	0.035	U
GRPCE-03-IA-	(2nd Floor -S) Tetrachloroethene	1.7		0.015	0.02	ppbV	1.7	
GRPCE-03-IA-	(2nd Floor -S) trans-1,2-Dichloroethene	0.035	U	0.031	0.035	ppbV	0.035	UJ
GRPCE-03-IA-	(2nd Floor -S) Trichloroethene (TCE)	0.027		0.023	0.026	ppbV	0.027	
GRPCE-03-IA-	(2nd Floor -S) Vinyl Chloride	0.054	U	0.051	0.054	ppbV	0.054	U

ANALYTICAL RESULTS SUMMARY

ALS REPORT NO. P1603725

Samp_No	Analyte	Result	Result_Qual	MDL	RL	Units	Val_Result	Val_Qual
GRPCE-03-IA- [REDACTED] (2nd Floor -S)	cis-1,2-Dichloroethene	0.14	U	0.13	0.14	ug/m3	0.14	U
GRPCE-03-IA- [REDACTED] (2nd Floor -S)	Tetrachloroethene	12		0.099	0.14	ug/m3	12	
GRPCE-03-IA- [REDACTED] (2nd Floor -S)	trans-1,2-Dichloroethene	0.14	U	0.12	0.14	ug/m3	0.14	UJ
GRPCE-03-IA- [REDACTED] (2nd Floor -S)	Trichloroethene (TCE)	0.14		0.12	0.14	ug/m3	0.14	
GRPCE-03-IA- [REDACTED] (2nd Floor -S)	Vinyl Chloride	0.14	U	0.13	0.14	ug/m3	0.14	U
GRPCE-03-IA- [REDACTED] (Basement-N)	cis-1,2-Dichloroethene	0.039	U	0.036	0.039	ppbV	0.039	U
GRPCE-03-IA- [REDACTED] (Basement-N)	Tetrachloroethene	36	D	0.16	0.23	ppbV	36	
GRPCE-03-IA- [REDACTED] (Basement-N)	trans-1,2-Dichloroethene	0.039	U	0.036	0.039	ppbV	0.039	UJ
GRPCE-03-IA- [REDACTED] (Basement-N)	Trichloroethene (TCE)	0.18		0.026	0.029	ppbV	0.18	
GRPCE-03-IA- [REDACTED] (Basement-N)	Vinyl Chloride	0.061	U	0.058	0.061	ppbV	0.061	U
GRPCE-03-IA- [REDACTED] (Basement-N)	cis-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-03-IA- [REDACTED] (Basement-N)	Tetrachloroethene	250	D	1.1	1.6	ug/m3	250	
GRPCE-03-IA- [REDACTED] (Basement-N)	trans-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	UJ
GRPCE-03-IA- [REDACTED] (Basement-N)	Trichloroethene (TCE)	0.96		0.14	0.16	ug/m3	0.96	
GRPCE-03-IA- [REDACTED] (Basement-N)	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U



August 9, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1007**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for four air samples collected at the Grand Rapids VI ER site. The samples were collected on July 29, 2016 and were analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the data on August 4, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory. All reported results were non-detect.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
ALS SDG P1603764**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1007	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 3, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603764		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Four air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory. All reported results were non-detect.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.73x: VOCs for GRPCE-01-IA- [REDACTED] (Main) 1.95x: VOCs for GRPCE-01-IA- [REDACTED] (Basement) 1.76x: VOCs for GRPCE-01-IA- [REDACTED] (Basement) 2.03x: VOCs for GRPCE-01-IA- [REDACTED] (Main)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	All reported results were non-detect.

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1603764

Samp_No		Analyte	Result	Result_Qual	Result_Units	MDL	RL	Val_Result	Result_Qual
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.044	U	ppbV	0.041	0.044	0.044	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.026	U	ppbV	0.019	0.026	0.026	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.044	U	ppbV	0.04	0.044	0.044	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.033	U	ppbV	0.029	0.033	0.033	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.069	U	ppbV	0.065	0.069	0.069	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.18	U	ug/m3	0.16	0.18	0.18	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.18	U	ug/m3	0.13	0.18	0.18	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.18	U	ug/m3	0.16	0.18	0.18	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.18	U	ug/m3	0.16	0.18	0.18	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.18	U	ug/m3	0.17	0.18	0.18	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.044	U	ppbV	0.04	0.044	0.044	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.026	U	ppbV	0.018	0.026	0.026	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.044	U	ppbV	0.04	0.044	0.044	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.032	U	ppbV	0.029	0.032	0.032	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.068	U	ppbV	0.064	0.068	0.068	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.17	U	ug/m3	0.12	0.17	0.17	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.049	U	ppbV	0.045	0.049	0.049	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.029	U	ppbV	0.021	0.029	0.029	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.049	U	ppbV	0.045	0.049	0.049	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.036	U	ppbV	0.032	0.036	0.036	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.076	U	ppbV	0.072	0.076	0.076	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.2	U	ug/m3	0.18	0.2	0.2	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.2	U	ug/m3	0.14	0.2	0.2	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.2	U	ug/m3	0.18	0.2	0.2	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.2	U	ug/m3	0.17	0.2	0.2	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.2	U	ug/m3	0.19	0.2	0.2	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.051	U	ppbV	0.047	0.051	0.051	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.03	U	ppbV	0.022	0.03	0.03	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.051	U	ppbV	0.047	0.051	0.051	U

ANALYTICAL RESULTS SUMMARY
 ALS ENVIRONMENTAL REPORT NO. P1603764

Samp_No		Analyte	Result	Result_Qual	Result_Units	MDL	RL	Val_Result	Result_Qual
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.079	U	ppbV	0.075	0.079	0.079	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.2	U	ug/m3	0.19	0.2	0.2	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.2	U	ug/m3	0.15	0.2	0.2	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.2	U	ug/m3	0.18	0.2	0.2	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.2	U	ug/m3	0.18	0.2	0.2	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.2	U	ug/m3	0.19	0.2	0.2	U



August 10, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1010**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for sixteen air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on July 26 and 29, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on August 8, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

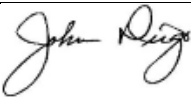
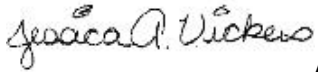
Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
SDGS 16071615 AND 16071850**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1010A	QC Reviewer (signature and date)	 August 9, 2016
Data Reviewer (signature and date)	 August 9, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16071615		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-14-IA- [REDACTED] BASEMENT)/GRPCE-14-IA- [REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	The individual canister certification for GRPCE-14-IA- [REDACTED] BASEMENT)-DP (canister 14582) contained a low level of trichloroethene (TCE); therefore, the TCE results for this sample were raised to the reporting limit and qualified as non-detect (U).

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071615
 Sample Identification GRPCE-14-IA (REDACTED) BASEMENT) Date Sampled: 7/26/2016
 Lab Number: 006A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.09 psig
 Final Pressure: -2.09 psig
 Canister ID: 14573

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	29	0.019	0.16	7.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071615
 Sample Identification GRPCE-14-IA [REDACTED] BASEMENT)-DP Date Sampled: 7/26/2016
 Lab Number: 007A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.59 psig
 Final Pressure: -2.59 psig
 Canister ID: 14582

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	27	0.019	0.16	6.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21 U	0.020	0.0039	0.04 U	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071615
 Sample Identification GRPCE-14-IA [REDACTED] (MAIN) Date Sampled: 7/26/2016
 Lab Number: 005A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.82 psig
 Final Pressure: -1.82 psig
 Canister ID: 14579

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	13	0.019	0.16	3.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16071615

Sample Identification GRPCE-14-IA-1168(BASEMENT) Date Sampled: 7/26/2016
 Lab Number: 004A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.44 psig
 Final Pressure: -2.44 psig
 Canister ID: 13965

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	27	0.019	0.16	6.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

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- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071615

Sample Identification GRPCE-14-IA [REDACTED]

Date Sampled: 7/26/2016

Lab Number: 003A

Date Received: 7/27/2016

Sample Type: Air, Can

Analysis Date: 7/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.81 psig

Final Pressure: -1.81 psig

Canister ID: 14213

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.8	0.036	0.27	0.26	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	28	0.019	0.16	7.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

—, Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071615
 Sample Identification GRPCE-15-1A (1) Date Sampled: 7/26/2016
 Lab Number: 001A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.8 psig
 Final Pressure: -2.8 psig
 Canister ID: 14029

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16071615

Sample Identification: GRPCE-15-1A (2) Date Sampled: 7/26/2016
 Lab Number: 002A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.13 psig
 Final Pressure: -1.13 psig
 Canister ID: 14003

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	U	ND	0.0061	0.04	1
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04		1
156-60-5	trans-1,2-Dichloroethene	0.32	0.019	0.16	0.080	0.0049	0.04		1
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04		1
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	ND	0.0088	0.04	1

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Jul-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16071615

Sample Identification GRPCE-18-OA [REDACTED] Date Sampled: 7/26/2016
 Lab Number: 008A Date Received: 7/27/2016
 Sample Type: Air, Can Analysis Date: 7/27/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.03 psig
 Final Pressure: -2.03 psig
 Canister ID: 13995

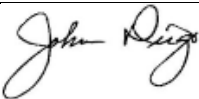
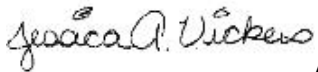
CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1010B	QC Reviewer (signature and date)	 August 9, 2016
Data Reviewer (signature and date)	 August 9, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16071850		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-15-IA- [REDACTED] GRPCE-15-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
N	The LCS/LCSD displayed a relative percent difference above the acceptance limit for tetrachloroethene; therefore, the associated positive results were qualified as estimated (J).

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071850

Sample Identification GRPCE-15-IA- [REDACTED] (BASEMENT)

Date Sampled: 7/29/2016

Lab Number: 007A

Date Received: 7/29/2016

Sample Type: Air, Can

Analysis Date: 7/30/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.22 psig

Final Pressure: -2.22 psig

Canister ID: 14535

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.3 J	0.036	0.27	0.19 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	22	0.019	0.16	5.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071850
 Sample Identification GRPCE-15-1A- [REDACTED] (MAIN) Date Sampled: 7/29/2016
 Lab Number: 006A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.90 psig
 Final Pressure: -1.90 psig
 Canister ID: 14539

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.8 J	0.036	0.27	0.27 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/09/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16071850

Sample Identification GRPCE-15-IA [REDACTED] Date Sampled: 7/29/2016
 Lab Number: 004A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.77 psig
 Final Pressure: -1.77 psig
 Canister ID: 14589

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.4 J	0.036	0.27	0.21 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	21	0.019	0.16	5.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/09/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071850
 Sample Identification GRPCE-15-1A [REDACTED] DP Date Sampled: 7/29/2016
 Lab Number: 005A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.93 psig
 Final Pressure: -1.93 psig
 Canister ID: 14540

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.2 J	0.036	0.27	0.18 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/09/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071850
 Sample Identification GRPCE-15-IA- [REDACTED] Date Sampled: 7/29/2016
 Lab Number: 003A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.06 psig
 Final Pressure: -2.06 psig
 Canister ID: 13961

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.3 J	0.036	0.27	0.19 J	0.0053	0.04	1	J
156-60-5	trans-1,2-Dichloroethene	19	0.019	0.16	4.7	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/09/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16071850

Sample Identification GRPCE-16-IA [REDACTED] (1)

Date Sampled: 7/29/2016

Lab Number: 001A

Date Received: 7/29/2016

Sample Type: Air, Can

Analysis Date: 7/30/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.59 psig

Final Pressure: -1.59 psig

Canister ID: 13947

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.6 J	0.036	0.27	0.23 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.32	0.019	0.16	0.080	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

Handwritten signature and date: 08/09/16

General Notes and Qualifiers: --, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit
 B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071850

Sample Identification GRPCE-16-IA-████ (2) Date Sampled: 7/29/2016
 Lab Number: 002A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -3.18 psig
 Final Pressure: -3.18 psig
 Canister ID: 14133

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.4 J	0.036	0.27	0.20 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.28	0.019	0.16	0.070	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/09/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 01-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16071850
 Sample Identification GRPCE-19-OA [REDACTED] Date Sampled: 7/29/2016
 Lab Number: 008A Date Received: 7/29/2016
 Sample Type: Air, Can Analysis Date: 7/30/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.36 psig
 Final Pressure: -2.36 psig
 Canister ID: 14074

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	J
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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08/09/16

General Notes and Qualifiers:

- ; Information not available or not applicable
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



August 15, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1017**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for two air samples collected at the Grand Rapids VI ER site. The samples were collected on July 29, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics. Tetra Tech received the data on August 8, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
EUROFINS-AIR TOXICS SDG 1608048**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1017	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 11, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1608048	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Two air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.71x: GRPCE-01-SS- [REDACTED] 2.13x: GRPCE-01-SS- [REDACTED]

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608048

CLIENTSAMPID	COMPOUND NAME	REPLMT	RESULTS	DATAFLAGS	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-SS-	Vinyl Chloride	0.17		ND	PPBV	0.17	U
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.17		ND	PPBV	0.17	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.17		ND	PPBV	0.17	U
GRPCE-01-SS-	Trichloroethene	0.17		ND	PPBV	0.17	U
GRPCE-01-SS-	Tetrachloroethene	0.17	9.9		PPBV	9.9	
GRPCE-01-SS-	Vinyl Chloride	0.44		ND	UG/M3	0.44	U
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.68		ND	UG/M3	0.68	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.68		ND	UG/M3	0.68	U
GRPCE-01-SS-	Trichloroethene	0.92		ND	UG/M3	0.92	U
GRPCE-01-SS-	Tetrachloroethene	1.2	67		UG/M3	67	
GRPCE-01-SS-	Vinyl Chloride	0.21		ND	PPBV	0.21	U
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.21		ND	PPBV	0.21	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.21		ND	PPBV	0.21	U
GRPCE-01-SS-	Trichloroethene	0.21		ND	PPBV	0.21	U
GRPCE-01-SS-	Tetrachloroethene	0.21	2.2		PPBV	2.2	
GRPCE-01-SS-	Vinyl Chloride	0.54		ND	UG/M3	0.54	U
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.84		ND	UG/M3	0.84	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.84		ND	UG/M3	0.84	U
GRPCE-01-SS-	Trichloroethene	1.1		ND	UG/M3	1.1	U
GRPCE-01-SS-	Tetrachloroethene	1.4	15		UG/M3	15	



August 15, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1019**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 32 air samples (including four field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on August 2, 5, 6, and 9, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on August 12, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
SDGS 16080126, 16080429, 16080458, AND 16080573**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1019A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16080126		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-17-IA- [REDACTED] 2)/GRPCE-17-IA- [REDACTED] 2)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent difference exceeded the acceptance limit for tetrachloroethene; therefore, the associated results were qualified as estimated (J).

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080126

Sample Identification GRPCE-16-1A [REDACTED] BASEMENT)

Date Sampled: 8/2/2016

Lab Number: 007A

Date Received: 8/2/2016

Sample Type: Air, Can

Analysis Date: 8/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.91 psig

Final Pressure: -1.91 psig

Canister ID: 14075

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16U	ND	0.0061	0.04U	1	
127-18-4	Tetrachloroethene	1.5 J	0.036	0.27	0.22 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10U	ND	0.0088	0.04U	1	

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08/15/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080126

Sample Identification GRPCE-16-1A [REDACTED] (MAIN) Date Sampled: 8/2/2016
 Lab Number: 006A Date Received: 8/2/2016
 Sample Type: Air, Can Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.09 psig
 Final Pressure: -2.09 psig
 Canister ID: 14122

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.9 S	0.036	0.27	0.28 T	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16080126

Sample Identification GRPCE-16-1A-1168(BASEMENT) Date Sampled: 8/2/2016
 Lab Number: 005A Date Received: 8/2/2016
 Sample Type: Air, Can Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.73 psig
 Final Pressure: -2.73 psig
 Canister ID: 14626

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.5 J	0.036	0.27	0.22 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	16	0.019	0.16	4.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080126
 Sample Identification GRPCE-16-IA- [REDACTED] Date Sampled: 8/2/2016
 Lab Number: 004A Date Received: 8/2/2016
 Sample Type: Air, Can Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.19 psig
 Final Pressure: -2.19 psig
 Canister ID: 14028

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.6 J	0.036	0.27	0.24 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080126
 Sample Identification GRPCE-17-IA [REDACTED] 1) Date Sampled: 8/2/2016
 Lab Number: 001A Date Received: 8/2/2016
 Sample Type: Air, Can Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.07 psig
 Final Pressure: -2.07 psig
 Canister ID: 14148

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.12	0.024	0.16	0.030	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	2.1	0.036	0.27	0.31	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.40	0.019	0.16	0.10	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080126
 Sample Identification GRPCE-17-IA (redacted) 2) Date Sampled: 8/2/2016
 Lab Number: 002A Date Received: 8/2/2016
 Sample Type: Air, Can Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.29 psig
 Final Pressure: -2.29 psig
 Canister ID: 14580

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.4 J	0.036	0.27	0.21 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.16	0.019	0.16	0.040	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	te
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16080126

Sample Identification GRPCE-17-1A (redacted)-2)-DP
 Date Sampled: 8/2/2016
 Lab Number: 003A
 Date Received: 8/2/2016
 Sample Type: Air, Can
 Analysis Date: 8/2/2016
 Test Method: EPA Method TO-15A
 Analyst: DRS
 Initial Pressure: -2.10 psig
 Final Pressure: -2.10 psig
 Canister ID: 14025

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.4 J	0.036	0.27	0.20 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.20	0.019	0.16	0.050	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	se
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

—: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 03-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080126

Sample Identification GRPCE-20-OA [REDACTED]

Date Sampled: 8/2/2016

Lab Number: 008A

Date Received: 8/2/2016

Sample Type: Air, Can

Analysis Date: 8/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.25 psig

Final Pressure: -2.25 psig

Canister ID: 14177

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54 J	0.036	0.27	0.080 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	JE
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	JE
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1019B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16080429		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-17-IA- [REDACTED] GRPCE-17-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-17-1A [REDACTED] (BASEMENT) Date Sampled: 8/5/2016
 Lab Number: 007A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.39 psig
 Final Pressure: -1.39 psig
 Canister ID: 14120

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	20	0.019	0.16	5.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-17-1A [REDACTED] (MAIN) Date Sampled: 8/5/2016
 Lab Number: 006A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.32 psig
 Final Pressure: -2.32 psig
 Canister ID: 14026

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	11	0.019	0.16	2.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/15/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND, Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-17-IA- [REDACTED] Date Sampled: 8/5/2016
 Lab Number: 004A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.27 psig
 Final Pressure: -2.27 psig
 Canister ID: 13999

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	+
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.20	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	+
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/15/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-17-IA- (BASEMENT)-DP Date Sampled: 8/5/2016
 Lab Number: 005A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.42 psig
 Final Pressure: -1.42 psig
 Canister ID: 14315

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17	0.019	0.16	4.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-17-IA-1 (MAIN) Date Sampled: 8/5/2016
 Lab Number: 003A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.14 psig
 Final Pressure: -2.14 psig
 Canister ID: 14478

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.20	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	22	0.019	0.16	5.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	se
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

jaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identificatio GRPCE-18-1A () Date Sampled: 8/5/2016
 Lab Number: 001A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.78 psig
 Final Pressure: -2.78 psig
 Canister ID: 13940

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.12 J	0.024	0.16	0.030 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.28	0.019	0.16	0.070	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-18-1A (redacted) 2) Date Sampled: 8/5/2016
 Lab Number: 002A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.45 psig
 Final Pressure: -2.45 psig
 Canister ID: 14291

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.16	0.019	0.16	0.040	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	sl
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/15/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080429
 Sample Identification: GRPCE-21-OA-XXXXXXXXXX Date Sampled: 8/5/2016
 Lab Number: 008A Date Received: 8/5/2016
 Sample Type: Air, Can Analysis Date: 8/6/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.47 psig
 Final Pressure: -2.47 psig
 Canister ID: 14078

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

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08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1019C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16080458		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-17-IA- [REDACTED] GRPCE-17-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.48x: GRPCE-19-IA- [REDACTED] 1)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-18-1A (REDACTED) BASEMENT)

Date Sampled: 8/6/2016

Lab Number: 007A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.42 psig

Final Pressure: -2.42 psig

Canister ID: 14068

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	2.2	0.036	0.27	0.33	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	64	0.019	0.16	16	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/14

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-18-IA [REDACTED] (MAIN)

Date Sampled: 8/6/2016

Lab Number: 006A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.54 psig

Final Pressure: -2.54 psig

Canister ID: 14159

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.5	0.036	0.27	0.22	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-18-IA- [REDACTED] Date Sampled: 8/6/2016
 Lab Number: 005A Date Received: 8/8/2016
 Sample Type: Air, Can Analysis Date: 8/8/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -4.5 psig
 Final Pressure: -4.5 psig
 Canister ID: 14612

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	3.3	0.036	0.27	0.48	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	58	0.019	0.16	15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-18-IA-██████████

Date Sampled: 8/6/2016

Lab Number: 003A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.72 psig

Final Pressure: -1.72 psig

Canister ID: 14462

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	3.8	0.036	0.27	0.56	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	80	0.019	0.16	20	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-18-IA-1 (MAIN)-DP

Date Sampled: 8/6/2016

Lab Number: 004A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.86 psig

Final Pressure: -2.86 psig

Canister ID: 14574

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	3.9	0.036	0.27	0.58	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	82	0.019	0.16	21	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-19-IA ()

Date Sampled: 8/6/2016

Lab Number: 001A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -5.7 psig

Final Pressure: -1.5 psig

Canister ID: 14121

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.059 J	0.036	0.23	0.015 J	0.009	0.059	1.48	+
127-18-4	Tetrachloroethene	0.80	0.053	0.40	0.12	0.0078	0.059	1.48	
156-60-5	trans-1,2-Dichloroethene	3.2	0.029	0.23	0.81	0.0073	0.059	1.48	
79-01-6	Trichloroethene	0.080 J	0.031	0.32	0.015 J	0.0058	0.059	1.48	+
75-01-4	Vinyl Chloride	ND	0.033	0.15 U	ND	0.013	0.059 U	48	

jaw
08/15/16

General Notes and Qualifiers:

-: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-19-IA (redacted) 2)

Date Sampled: 8/6/2016

Lab Number: 002A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.2 psig

Final Pressure: -2.2 psig

Canister ID: 14076

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.9	0.019	0.16	0.48	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080458

Sample Identification GRPCE-22-OA-XXXXXXXXXX

Date Sampled: 8/6/2016

Lab Number: 008A

Date Received: 8/8/2016

Sample Type: Air, Can

Analysis Date: 8/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.42 psig

Final Pressure: -2.42 psig

Canister ID: 14079

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	je
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

DRS
08/15/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1019D	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 15 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16080573		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-19-IA-[REDACTED] BASEMENT)/GRPCE-19-IA-[REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080573
 Sample Identification GRPCE-19-1A (██████████ BASEMENT) Date Sampled: 8/9/2016
 Lab Number: 006A Date Received: 8/9/2016
 Sample Type: Air, Can Analysis Date: 8/9/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.11 psig
 Final Pressure: -2.11 psig
 Canister ID: 14125

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17	0.019	0.16	4.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

jaw
08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080573

Sample Identification GRPCE-19-IA [REDACTED] (BASEMENT)-DP

Date Sampled: 8/9/2016

Lab Number: 007A

Date Received: 8/9/2016

Sample Type: Air, Can

Analysis Date: 8/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.41 psig

Final Pressure: -2.41 psig

Canister ID: 13964

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17	0.019	0.16	4.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/13/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16080573

Sample Identification: GRPCE-19-IA- [REDACTED] (MAIN) Date Sampled: 8/9/2016
 Lab Number: 005A Date Received: 8/9/2016
 Sample Type: Air, Can Analysis Date: 8/9/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.64 psig
 Final Pressure: -2.64 psig
 Canister ID: 13986

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	9.2	0.019	0.16	2.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080573
 Sample Identification GRPCE-19-██████████ (BASEMENT) Date Sampled: 8/9/2016
 Lab Number: 004A Date Received: 8/9/2016
 Sample Type: Air, Can Analysis Date: 8/9/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.3 psig
 Final Pressure: -2.3 psig
 Canister ID: 14001

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080573

Sample Identification GRPCE-19-IA-1 (MAIN)

Date Sampled: 8/9/2016

Lab Number: 003A

Date Received: 8/9/2016

Sample Type: Air, Can

Analysis Date: 8/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.37 psig

Final Pressure: -2.37 psig

Canister ID: 14053

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	20	0.019	0.16	5.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

Jaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080573

Sample Identification GRPCE-20-IA (redacted) 1)

Date Sampled: 8/9/2016

Lab Number: 001A

Date Received: 8/9/2016

Sample Type: Air, Can

Analysis Date: 8/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.03 psig

Final Pressure: -2.03 psig

Canister ID: 14248

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.4	0.019	0.16	0.35	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

Jaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080573

Sample Identification GRPCE-20-1A (redacted) 2)

Date Sampled: 8/9/2016

Lab Number: 002A

Date Received: 8/9/2016

Sample Type: Air, Can

Analysis Date: 8/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.92 psig

Final Pressure: -2.92 psig

Canister ID: 13969

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.79	0.019	0.16	0.20	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16080573
 Sample Identification GRPCE-23-OA [REDACTED] Date Sampled: 8/9/2016
 Lab Number: 008A Date Received: 8/9/2016
 Sample Type: Air, Can Analysis Date: 8/9/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.07 psig
 Final Pressure: -1.07 psig
 Canister ID: 14245

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16 U	ND	0.0049	0.04 U	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/15/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



August 22, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1030**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 24 air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on August 10 through 16, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories, ALS Environmental Laboratories, and Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on August 19, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for these data sets. The data is usable as reported by the laboratories.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16080840 AND 16081037
ALS ENVIRONMENTAL SDG P1603947
EUROFINS-AIR TOXICS SDGS 1608195 AND 1608274**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1030A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16080840		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-20-IA [REDACTED] BASEMENT)

Date Sampled: 8/12/2016

Lab Number: 006A

Date Received: 8/12/2016

Sample Type: Air, Can

Analysis Date: 8/12/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.62 psig

Final Pressure: -1.62 psig

Canister ID: 14011

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/22/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-20-IA (REDACTED) (MAIN)

Date Sampled: 8/12/2016

Lab Number: 005A

Date Received: 8/12/2016

Sample Type: Air, Can

Analysis Date: 8/12/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.1 psig

Final Pressure: -1.1 psig

Canister ID: 14610

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.9	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gan
08/22/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-20-IA- [REDACTED]

Date Sampled: 8/12/2016

Lab Number: 004A

Date Received: 8/12/2016

Sample Type: Air, Can

Analysis Date: 8/12/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.74 psig

Final Pressure: -1.74 psig

Canister ID: 14141

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17	0.019	0.16	4.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-20-IA (MAIN)

Date Sampled: 8/12/2016

Lab Number: 003A

Date Received: 8/12/2016

Sample Type: Air, Can

Analysis Date: 8/12/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.83 psig

Final Pressure: -1.83 psig

Canister ID: 13993

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	21	0.019	0.16	5.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-21-IA [REDACTED] 1)
 Lab Number: 001A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.61 psig
 Final Pressure: -2.61 psig
 Canister ID: 14124

Date Sampled: 8/12/2016
 Date Received: 8/12/2016
 Analysis Date: 8/12/2016
 Analyst: JTF

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16080840

Sample Identification **GRPCE-21-IA-XXXXXXXXXX2)**

Date Sampled: 8/12/2016

Lab Number: **002A**

Date Received: 8/12/2016

Sample Type: **Air, Can**

Analysis Date: 8/12/2016

Test Method: **EPA Method TO-15A**

Analyst: JTF

Initial Pressure: **-2.27 psig**

Final Pressure: **-2.27 psig**

Canister ID: **14123**

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12 J	0.019	0.16	0.030 J	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	le
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16080840

Sample Identification GRPCE-24-OA [REDACTED]

Date Sampled: 8/12/2016

Lab Number: 007A

Date Received: 8/12/2016

Sample Type: Air, Can

Analysis Date: 8/12/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -0.62 psig

Final Pressure: -0.62 psig

Canister ID: 14577

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	je
79-01-6	Trichloroethene	ND	0.021	0.21 U	ND	0.0039	0.04 U	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1030B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 15, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16081037		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Six air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 17-Aug-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16081037

Sample Identification **GRPCE-21-IA (REDACTED) BASEMENT)**

Date Sampled: 8/16/2016

Lab Number: **005A**

Date Received: 8/16/2016

Sample Type: **Air, Can**

Analysis Date: 8/16/2016

Test Method: **EPA Method TO-15A**

Analyst: **JTF**

Initial Pressure: -1.90 psig

Final Pressure: -1.90 psig

Canister ID: **14008**

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/22/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 17-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081037

Sample Identification GRPCE-21-1A- [REDACTED]

Date Sampled: 8/16/2016

Lab Number: 004A

Date Received: 8/16/2016

Sample Type: Air, Can

Analysis Date: 8/16/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.36 psig

Final Pressure: -2.36 psig

Canister ID: 14132

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/22/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 17-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081037

Sample Identification GRPCE-21-IA- [REDACTED]

Date Sampled: 8/16/2016

Lab Number: 003A

Date Received: 8/16/2016

Sample Type: Air, Can

Analysis Date: 8/16/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.01 psig

Final Pressure: -2.01 psig

Canister ID: 14548

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	20	0.019	0.16	4.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

JTF
08/22/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 17-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081037

Sample Identification GRPCE-22-IA [REDACTED] 1)

Date Sampled: 8/16/2016

Lab Number: 001A

Date Received: 8/16/2016

Sample Type: Air, Can

Analysis Date: 8/16/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.9 psig

Final Pressure: -2.9 psig

Canister ID: 13989

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	JE
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.59	0.019	0.16	0.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	JE
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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08/22/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 17-Aug-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16081037

Sample Identification GRPCE-22-IA-██████ 2)

Date Sampled: 8/16/2016

Lab Number: 002A

Date Received: 8/16/2016

Sample Type: Air, Can

Analysis Date: 8/16/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -2.04 psig

Final Pressure: -2.04 psig

Canister ID: 13933

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.63	0.019	0.16	0.16	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	sl
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/22/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 17-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081037

Sample Identification GRPCE-25-OA [REDACTED]

Date Sampled: 8/16/2016

Lab Number: 006A

Date Received: 8/16/2016

Sample Type: Air, Can

Analysis Date: 8/16/2016

Test Method: EPA Method TO-15A

Analyst: JTF

Initial Pressure: -1.93 psig

Final Pressure: -1.93 psig

Canister ID: 14398

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.14 J	0.036	0.27	0.020 J	0.0053	0.04	1	je
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16 U	ND	0.0049	0.04 U	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	je
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
08/22/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1030C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 22, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1603947		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Four air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-01-SS- [REDACTED] GRPCE-01-SS- [REDACTED] DP and GRPCE-04-IA- [REDACTED] GRPCE-04-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.54x: VOCs for GRPCE-01-IA- [REDACTED] DP 1.58x: VOCs for GRPCE-01-IA- [REDACTED] 1.56x: VOCs for GRPCE-01-SS- [REDACTED] 1.69x: VOCs for GRPCE-01-SS- [REDACTED] DP

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1603947

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-SS-	cis-1,2-Dichloroethene	2	U	ppbV	1.8	2	2.0	U
GRPCE-01-SS-	Tetrachloroethene	770		ppbV	0.83	1.2	770	
GRPCE-01-SS-	trans-1,2-Dichloroethene	2	U	ppbV	1.8	2	2.0	U
GRPCE-01-SS-	Trichloroethene (TCE)	3.7		ppbV	1.3	1.5	3.7	
GRPCE-01-SS-	Vinyl Chloride	3.1	U	ppbV	2.9	3.1	3.1	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	7.8	U	ug/m3	7.2	7.8	7.8	U
GRPCE-01-SS-	Tetrachloroethene	5200		ug/m3	5.6	7.8	5200	
GRPCE-01-SS-	trans-1,2-Dichloroethene	7.8	U	ug/m3	7.1	7.8	7.8	U
GRPCE-01-SS-	Trichloroethene (TCE)	20		ug/m3	6.9	7.8	20	
GRPCE-01-SS-	Vinyl Chloride	7.8	U	ug/m3	7.4	7.8	7.8	U
GRPCE-01-SS-	DP cis-1,2-Dichloroethene	2.1	U	ppbV	2	2.1	2.1	U
GRPCE-01-SS-	DP Tetrachloroethene	1000		ppbV	0.9	1.2	1000	
GRPCE-01-SS-	DP trans-1,2-Dichloroethene	2.1	U	ppbV	1.9	2.1	2.1	U
GRPCE-01-SS-	DP Trichloroethene (TCE)	4.2		ppbV	1.4	1.6	4.2	
GRPCE-01-SS-	DP Vinyl Chloride	3.3	U	ppbV	3.1	3.3	3.3	U
GRPCE-01-SS-	DP cis-1,2-Dichloroethene	8.5	U	ug/m3	7.8	8.5	8.5	U
GRPCE-01-SS-	DP Tetrachloroethene	7000		ug/m3	6.1	8.5	7000	
GRPCE-01-SS-	DP trans-1,2-Dichloroethene	8.5	U	ug/m3	7.7	8.5	8.5	U
GRPCE-01-SS-	DP Trichloroethene (TCE)	22		ug/m3	7.5	8.5	22	
GRPCE-01-SS-	DP Vinyl Chloride	8.5	U	ug/m3	8	8.5	8.5	U
GRPCE-04-IA-	cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.040	U
GRPCE-04-IA-	Tetrachloroethene	0.25		ppbV	0.017	0.023	0.25	
GRPCE-04-IA-	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.040	U
GRPCE-04-IA-	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-04-IA-	Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-04-IA-	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-04-IA-	Tetrachloroethene	1.7		ug/m3	0.11	0.16	1.7	
GRPCE-04-IA-	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-04-IA-	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-04-IA-	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-04-IA-	DP cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-04-IA-	DP Tetrachloroethene	0.25		ppbV	0.016	0.023	0.25	
GRPCE-04-IA-	DP trans-1,2-Dichloroethene	0.039	U	ppbV	0.035	0.039	0.039	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1603947

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-04-IA-	DP	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-04-IA-	DP	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.060	U
GRPCE-04-IA-	DP	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-04-IA-	DP	Tetrachloroethene	1.7		ug/m3	0.11	0.15	1.7	
GRPCE-04-IA-	DP	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-04-IA-	DP	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-04-IA-	DP	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1030D	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 22, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1608195	Analyses	
Analyses		Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix		One air sample	
Field Duplicate Pairs		None	
Field Blanks		None	

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	4.00x: GRPCE-01-SS- [REDACTED]

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608195

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-SS-██████	Vinyl Chloride		ND	0.089	0.40	PPBV	0.40	U
GRPCE-01-SS-██████	trans-1,2-Dichloroethene		ND	0.12	0.40	PPBV	0.40	U
GRPCE-01-SS-██████	cis-1,2-Dichloroethene		ND	0.11	0.40	PPBV	0.40	U
GRPCE-01-SS-██████	Trichloroethene	0.17	J	0.12	0.40	PPBV	0.17	J
GRPCE-01-SS-██████	Tetrachloroethene	100		0.11	0.40	PPBV	100	
GRPCE-01-SS-██████	Vinyl Chloride		ND	0.23	1.0	UG/M3	1.0	U
GRPCE-01-SS-██████	trans-1,2-Dichloroethene		ND	0.47	1.6	UG/M3	1.6	U
GRPCE-01-SS-██████	cis-1,2-Dichloroethene		ND	0.46	1.6	UG/M3	1.6	U
GRPCE-01-SS-██████	Trichloroethene	0.91	J	0.64	2.1	UG/M3	0.91	J
GRPCE-01-SS-██████	Tetrachloroethene	690		0.74	2.7	UG/M3	690	

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1030E	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 22 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 22, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1608274	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Six air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.63x: GRPCE-02-IA-02-[REDACTED] (Basement) 1.86x: GRPCE-02-IA-02-[REDACTED] (Main) 1.76x: GRPCE-02-IA-02-[REDACTED] (Main) 1.89x: GRPCE-02-IA-02-[REDACTED] (Main) 1.77x: GRPCE-02-IA-02-[REDACTED] (Basement) 2.18x: GRPCE-02-IA-02-[REDACTED] (Basement)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608274

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.058	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	0.52		0.028	0.18	PPBV	0.52	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.041	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.059	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.046	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.23	0.70	UG/M3	0.70	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	3.5		0.19	1.2	UG/M3	3.5	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.16	0.70	UG/M3	0.70	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.32	0.95	UG/M3	0.95	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.12	0.45	UG/M3	0.45	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.062	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	0.16	J	0.030	0.19	PPBV	0.16	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.044	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Trichloroethene		ND	0.064	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.050	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.24	0.75	UG/M3	0.75	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	1.1	J	0.20	1.3	UG/M3	1.1	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.17	0.75	UG/M3	0.75	U
GRPCE-02-IA-02-	(Main) Trichloroethene		ND	0.34	1.0	UG/M3	1.0	U
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.13	0.48	UG/M3	0.48	U
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.053	0.16	PPBV	0.16	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	0.73		0.026	0.16	PPBV	0.73	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.038	0.16	PPBV	0.16	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.055	0.16	PPBV	0.16	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.043	0.16	PPBV	0.16	U
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.21	0.65	UG/M3	0.65	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	5.0		0.18	1.1	UG/M3	5.0	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.15	0.65	UG/M3	0.65	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.29	0.88	UG/M3	0.88	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.11	0.42	UG/M3	0.42	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.061	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	0.086	J	0.030	0.19	PPBV	0.086	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.043	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Trichloroethene		ND	0.062	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.049	0.19	PPBV	0.19	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.24	0.74	UG/M3	0.74	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	0.58	J	0.20	1.3	UG/M3	0.58	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.17	0.74	UG/M3	0.74	U
GRPCE-02-IA-02-	(Main) Trichloroethene		ND	0.34	1.0	UG/M3	1.0	U
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.12	0.48	UG/M3	0.48	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
 EUROFINs-AIR TOXICS REPORT NO. 1608274

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.071	0.22	PPBV	0.22	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	0.32		0.035	0.22	PPBV	0.32	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.051	0.22	PPBV	0.22	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.073	0.22	PPBV	0.22	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.057	0.22	PPBV	0.22	U
GRPCE-02-IA-02-	(Basement) cis-1,2-Dichloroethene		ND	0.28	0.86	UG/M3	0.86	U
GRPCE-02-IA-02-	(Basement) Tetrachloroethene	2.1		0.24	1.5	UG/M3	2.1	
GRPCE-02-IA-02-	(Basement) trans-1,2-Dichloroethene		ND	0.20	0.86	UG/M3	0.86	U
GRPCE-02-IA-02-	(Basement) Trichloroethene		ND	0.39	1.2	UG/M3	1.2	U
GRPCE-02-IA-02-	(Basement) Vinyl Chloride		ND	0.15	0.56	UG/M3	0.56	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.057	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	0.086	J	0.028	0.18	PPBV	0.086	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.041	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Main) Trichloroethene	0.069	J	0.059	0.18	PPBV	0.069	J
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.046	0.18	PPBV	0.18	U
GRPCE-02-IA-02-	(Main) cis-1,2-Dichloroethene		ND	0.23	0.70	UG/M3	0.70	U
GRPCE-02-IA-02-	(Main) Tetrachloroethene	0.58	J	0.19	1.2	UG/M3	0.58	J
GRPCE-02-IA-02-	(Main) trans-1,2-Dichloroethene		ND	0.16	0.70	UG/M3	0.70	U
GRPCE-02-IA-02-	(Main) Trichloroethene	0.37	J	0.32	0.94	UG/M3	0.37	J
GRPCE-02-IA-02-	(Main) Vinyl Chloride		ND	0.12	0.45	UG/M3	0.45	U



September 1, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1051**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for eight air samples collected at the Grand Rapids VI ER site. The samples were collected on August 19, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on August 24, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
EUROFINS-AIR TOXICS SDGS 1608384**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1051	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 30 August 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> August 22, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1608384	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Eight air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.66x: GRPCE-03-IA- [REDACTED] (Main) 1.91x: GRPCE-03-IA- [REDACTED] (Basement) 1.67x: GRPCE-01-IA- [REDACTED] (Basement) 5.53x: GRPCE-01-IA- [REDACTED] (Main) 1.75x: GRPCE-03-IA- [REDACTED] (Basement) 8.00x: GRPCE-03-IA- [REDACTED] (Main) 1.84x: GRPCE-03-IA- [REDACTED] (Main) 8.35x: GRPCE-03-IA- [REDACTED] (Basement)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608384

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-IA-	(Main) Vinyl Chloride		ND	0.14	0.55	PPBV	0.55	U
GRPCE-01-IA-	(Main) trans-1,2-Dichloroethene		ND	0.13	0.55	PPBV	0.55	U
GRPCE-01-IA-	(Main) cis-1,2-Dichloroethene		ND	0.18	0.55	PPBV	0.55	U
GRPCE-01-IA-	(Main) Trichloroethene		ND	0.18	0.55	PPBV	0.55	U
GRPCE-01-IA-	(Main) Tetrachloroethene	0.31	J	0.088	0.55	PPBV	0.31	J
GRPCE-01-IA-	(Main) Vinyl Chloride		ND	0.37	1.4	UG/M3	1.4	U
GRPCE-01-IA-	(Main) trans-1,2-Dichloroethene		ND	0.51	2.2	UG/M3	2.2	U
GRPCE-01-IA-	(Main) cis-1,2-Dichloroethene		ND	0.72	2.2	UG/M3	2.2	U
GRPCE-01-IA-	(Main) Trichloroethene		ND	1.0	3.0	UG/M3	3.0	U
GRPCE-01-IA-	(Main) Tetrachloroethene	2.1	J	0.60	3.8	UG/M3	2.1	J
GRPCE-01-IA-	(Basement) Vinyl Chloride		ND	0.044	0.17	PPBV	0.17	U
GRPCE-01-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.039	0.17	PPBV	0.17	U
GRPCE-01-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.054	0.17	PPBV	0.17	U
GRPCE-01-IA-	(Basement) Trichloroethene		ND	0.056	0.17	PPBV	0.17	U
GRPCE-01-IA-	(Basement) Tetrachloroethene	1.1		0.027	0.17	PPBV	1.1	
GRPCE-01-IA-	(Basement) Vinyl Chloride		ND	0.11	0.43	UG/M3	0.43	U
GRPCE-01-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.15	0.66	UG/M3	0.66	U
GRPCE-01-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.22	0.66	UG/M3	0.66	U
GRPCE-01-IA-	(Basement) Trichloroethene		ND	0.30	0.90	UG/M3	0.90	U
GRPCE-01-IA-	(Basement) Tetrachloroethene	7.6		0.18	1.1	UG/M3	7.6	
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.21	0.80	PPBV	0.80	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.19	0.80	PPBV	0.80	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	0.26	0.80	PPBV	0.80	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	0.27	0.80	PPBV	0.80	U
GRPCE-03-IA-	(Main) Tetrachloroethene		ND	0.13	0.80	PPBV	0.80	U
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.54	2.0	UG/M3	2.0	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.74	3.2	UG/M3	3.2	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	1.0	3.2	UG/M3	3.2	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	1.4	4.3	UG/M3	4.3	U
GRPCE-03-IA-	(Main) Tetrachloroethene		ND	0.86	5.4	UG/M3	5.4	U
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.046	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.041	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.057	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Basement) Trichloroethene		ND	0.059	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	0.19		0.028	0.18	PPBV	0.19	
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.12	0.45	UG/M3	0.45	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.16	0.69	UG/M3	0.69	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.23	0.69	UG/M3	0.69	U
GRPCE-03-IA-	(Basement) Trichloroethene		ND	0.32	0.94	UG/M3	0.94	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608384

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-03-IA-	(Basement) Tetrachloroethene	1.3		0.19	1.2	UG/M3	1.3	
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.048	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.043	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	0.060	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	0.062	0.18	PPBV	0.18	U
GRPCE-03-IA-	(Main) Tetrachloroethene	0.18		0.029	0.18	PPBV	0.18	
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.12	0.47	UG/M3	0.47	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.17	0.73	UG/M3	0.73	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	0.24	0.73	UG/M3	0.73	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	0.33	0.99	UG/M3	0.99	U
GRPCE-03-IA-	(Main) Tetrachloroethene	1.2		0.20	1.2	UG/M3	1.2	
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.050	0.19	PPBV	0.19	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.044	0.19	PPBV	0.19	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.062	0.19	PPBV	0.19	U
GRPCE-03-IA-	(Basement) Trichloroethene		ND	0.064	0.19	PPBV	0.19	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	0.41		0.030	0.19	PPBV	0.41	
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.13	0.49	UG/M3	0.49	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.18	0.76	UG/M3	0.76	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.25	0.76	UG/M3	0.76	U
GRPCE-03-IA-	(Basement) Trichloroethene		ND	0.34	1.0	UG/M3	1.0	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	2.8		0.21	1.3	UG/M3	2.8	
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.044	0.17	PPBV	0.17	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.038	0.17	PPBV	0.17	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	0.054	0.17	PPBV	0.17	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	0.056	0.17	PPBV	0.17	U
GRPCE-03-IA-	(Main) Tetrachloroethene	0.15	J	0.026	0.17	PPBV	0.15	J
GRPCE-03-IA-	(Main) Vinyl Chloride		ND	0.11	0.42	UG/M3	0.42	U
GRPCE-03-IA-	(Main) trans-1,2-Dichloroethene		ND	0.15	0.66	UG/M3	0.66	U
GRPCE-03-IA-	(Main) cis-1,2-Dichloroethene		ND	0.21	0.66	UG/M3	0.66	U
GRPCE-03-IA-	(Main) Trichloroethene		ND	0.30	0.89	UG/M3	0.89	U
GRPCE-03-IA-	(Main) Tetrachloroethene	1.0	J	0.18	1.1	UG/M3	1.0	J
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.22	0.84	PPBV	0.84	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.19	0.84	PPBV	0.84	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	0.27	0.84	PPBV	0.84	U
GRPCE-03-IA-	(Basement) Trichloroethene		ND	0.28	0.84	PPBV	0.84	U
GRPCE-03-IA-	(Basement) Tetrachloroethene	0.43	J	0.13	0.84	PPBV	0.43	J
GRPCE-03-IA-	(Basement) Vinyl Chloride		ND	0.56	2.1	UG/M3	2.1	U
GRPCE-03-IA-	(Basement) trans-1,2-Dichloroethene		ND	0.77	3.3	UG/M3	3.3	U
GRPCE-03-IA-	(Basement) cis-1,2-Dichloroethene		ND	1.1	3.3	UG/M3	3.3	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608384

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-03-IA- [REDACTED] (Basement)	Trichloroethene		ND	1.5	4.5	UG/M3	4.5	U
GRPCE-03-IA- [REDACTED] (Basement)	Tetrachloroethene	2.9	J	0.90	5.7	UG/M3	2.9	J



September 9, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1063**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 37 air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on August 19 through 31, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories and Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on September 7, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16081382, 16081524, 16081927, AND
16090184
EUROFINS-AIR TOXICS SDG 1609003**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1063A		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 8, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 September 2016
Laboratory Report No.	16081382		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-23-IA-██████1)/GRPCE-23-IA-██████1)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent differences exceeded the acceptance limits for cis-1,2-dichloroethene and trans-1,2-dichloroethene; therefore, the results were qualified as estimated (J/UJ) unless previously qualified for other exceedances.

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Method blanks:

Within Criteria	Exceedance/Notes
N	<p>All five VOCs were detected in the method blank below the reporting limit (RL). Results below the RL were raised to the RL and qualified as non-detect (U). Results above the RL but less than ten times the blank concentration were qualified as estimated with a possible high bias (J+). No qualifications were applied for results greater than ten times the blank concentrations. The following qualifications were applied:</p> <p><u>Flag “J+”:</u> Tetrachloroethene for GRPCE-23-IA-[REDACTED] 1)-DP and GRPCE-26-OA-[REDACTED] Tetrachloroethene and trans-1,2-dichloroethene for GRPCE-23-IA-[REDACTED] 1) trans-1,2-Dichloroethene for GRPCE-22-IA-[REDACTED] 2)</p> <p><u>Raise to RL and flag “U”:</u> cis-1,2-Dichloroethene and trichloroethene for GRPCE-23-IA-[REDACTED] 1) trans-1,2-Dichloroethene and trichloroethene for GRPCE-23-IA-[REDACTED] 1)-DP and GRPCE-26-OA-[REDACTED] Trichloroethene for GRPCE-22-IA-[REDACTED] BASEMENT), GRPCE-22-IA-[REDACTED] MAIN), GRPCE-22-IA-[REDACTED] GRPCE-22-IA-[REDACTED] and GRPCE-22-IA-[REDACTED] 2)</p>

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-22-IA- [REDACTED] (BASEMENT)

Date Sampled: 8/19/2016

Lab Number: 007A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.75 psig

Final Pressure: -1.75 psig

Canister ID: 13997

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	14	0.019	0.16	3.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.05	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-22-IA- [REDACTED] (MAIN)
 Lab Number: 006A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -1.77 psig
 Final Pressure: -1.77 psig
 Canister ID: 14128

Date Sampled: 8/19/2016
 Date Received: 8/19/2016
 Analysis Date: 8/21/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.25	0.019	0.16	1.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-22-IA- [REDACTED]

Date Sampled: 8/19/2016

Lab Number: 005A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.61 psig

Final Pressure: -1.61 psig

Canister ID: 14571

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	14	0.019	0.16	3.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-22-IA [REDACTED]

Date Sampled: 8/19/2016

Lab Number: 004A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.31 psig

Final Pressure: -1.31 psig

Canister ID: 14399

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.21	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17J	0.019	0.16	4.2J	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
08/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-22-IA [REDACTED] 2)
 Lab Number: 003A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.43 psig
 Final Pressure: -2.43 psig
 Canister ID: 14534

Date Sampled: 8/19/2016
 Date Received: 8/19/2016
 Analysis Date: 8/21/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.20	0.019	0.16	0.050	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-23-IA-[REDACTED] 1)

Date Sampled: 8/19/2016

Lab Number: 001A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.1 psig

Final Pressure: -2.1 psig

Canister ID: 14464

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.54 J+	0.036	0.27	0.080 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.20 J+	0.019	0.16	0.050 J+	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	ND 0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-23-IA [REDACTED] 1)-DP

Date Sampled: 8/19/2016

Lab Number: 002A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.61 psig

Final Pressure: -2.61 psig

Canister ID: 14071

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.54 J+	0.036	0.27	0.080 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12	0.019	0.16	0.010	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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08/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 22-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081382

Sample Identification GRPCE-26-OA-XXXXXXXXXX

Date Sampled: 8/19/2016

Lab Number: 008A

Date Received: 8/19/2016

Sample Type: Air, Can

Analysis Date: 8/21/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.16 psig

Final Pressure: -2.16 psig

Canister ID: 13966

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079	0.019	0.16	0.020	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1063B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 8, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 September 2016
Laboratory Report No.	16081524		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-23-IA- [REDACTED] (BASEMENT)

Date Sampled: 8/23/2016

Lab Number: 006A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.89 psig

Final Pressure: -1.89 psig

Canister ID: 14629

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	12	0.019	0.16	3.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-23-IA- [REDACTED] (MAIN)

Date Sampled: 8/23/2016

Lab Number: 005A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.39 psig

Final Pressure: -2.39 psig

Canister ID: 14625

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.5	0.019	0.16	2.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
09/08/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-23-IA- [REDACTED]

Date Sampled: 8/23/2016

Lab Number: 004A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.80 psig

Final Pressure: -1.80 psig

Canister ID: 13968

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	11	0.019	0.16	2.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-23-1A-1168(MAIN)

Date Sampled: 8/23/2016

Lab Number: 003A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.82 psig

Final Pressure: -1.82 psig

Canister ID: 14004

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.1	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-24-IA-1170(1)

Date Sampled: 8/23/2016

Lab Number: 001A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.36 psig

Final Pressure: -2.36 psig

Canister ID: 14160

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12 J	0.019	0.16	0.030 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

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09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-24-IA (redacted) 2)

Date Sampled: 8/23/2016

Lab Number: 002A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/23/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.56 psig

Final Pressure: -1.56 psig

Canister ID: 14127

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.20	0.019	0.16	0.050	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081524

Sample Identification GRPCE-27-0A-██████

Date Sampled: 8/23/2016

Lab Number: 007A

Date Received: 8/23/2016

Sample Type: Air, Can

Analysis Date: 8/24/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.79 psig

Final Pressure: -1.79 psig

Canister ID: 14150

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1063C		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 8, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 September 2016
Laboratory Report No.	16081927		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-24-IA-[REDACTED] BASEMENT)/GRPCE-24-IA-[REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	Tetrachloroethene and cis-1,2-dichloroethene were detected in the method blank below the reporting limit (RL). The cis-1,2-dichloroethene results for GRPCE-24-IA-██████████ (BASEMENT), GRPCE-24-IA-██████████ (BASEMENT)-DP, GRPCE-24-IA-██████████ and GRPCE-25-IA-██████████ (1) were below the RL and were therefore raised to the RL and qualified as non-detect (U). The tetrachloroethene results for GRPCE-25-IA-██████████ (1), GRPCE-25-IA-██████████ (2), and GRPCE-28-OA-██████████ were above the RL but less than ten times the blank concentration and were therefore qualified as estimated with a possible high bias (J+). No qualifications were applied for results greater than ten times the blank concentrations.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the reporting limit and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-24-IA- [REDACTED] (BASEMENT) Date Sampled: 8/28/2016
 Lab Number: 006A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.34 psig
 Final Pressure: -2.34 psig
 Canister ID: 14157

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	2.2	0.036	0.27	0.32	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	66	0.019	0.16	17	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081927

Sample Identification GRPCE-24-IA- [REDACTED] BASEMENT)-DP

Date Sampled: 8/28/2016

Lab Number: 007A

Date Received: 8/29/2016

Sample Type: Air, Can

Analysis Date: 8/29/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.05 psig

Final Pressure: -2.05 psig

Canister ID: 14126

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	2.1	0.036	0.27	0.31	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	64	0.019	0.16	16	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-24-IA [REDACTED] (MAIN) Date Sampled: 8/28/2016
 Lab Number: 005A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.65 psig
 Final Pressure: -1.65 psig
 Canister ID: 14541

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RI (ug/m ³)	Results (ppbV)	MDL (ppbV)	RI (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.7	0.019	0.16	1.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RI; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-24-1A-1 (BASEMENT) Date Sampled: 8/28/2016
 Lab Number: 004A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.21 psig
 Final Pressure: -2.21 psig
 Canister ID: 14032

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	5.3	0.036	0.27	0.78	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	82	0.019	0.16	21	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04		

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09/08/16

General Notes and Qualifiers:

—: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16081927

Sample Identification GRPCE-24-1A [REDACTED]

Date Sampled: 8/28/2016

Lab Number: 003A

Date Received: 8/29/2016

Sample Type: Air, Can

Analysis Date: 8/29/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.61 psig

Final Pressure: -1.61 psig

Canister ID: 14338

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	4.2	0.036	0.27	0.62	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	71	0.019	0.16	18	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	r
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-25-IA [REDACTED] 1) Date Sampled: 8/28/2016
 Lab Number: 001A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.43 psig
 Final Pressure: -2.43 psig
 Canister ID: 13998

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.070	0.024	0.16	0.070	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.54 J+	0.036	0.27	0.080 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.71	0.019	0.16	0.18	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-25-1A (redacted) 2) Date Sampled: 8/28/2016
 Lab Number: 002A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.84 psig
 Final Pressure: -1.84 psig
 Canister ID: 14010

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.41 J+	0.036	0.27	0.060 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.28	0.019	0.16	0.070	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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09/08/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Aug-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16081927
 Sample Identification GRPCE-28-OA [REDACTED] Date Sampled: 8/28/2016
 Lab Number: 008A Date Received: 8/29/2016
 Sample Type: Air, Can Analysis Date: 8/29/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.6 psig
 Final Pressure: -2.6 psig
 Canister ID: 13927

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41 J+	0.036	0.27	0.060 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
09/08/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1063D		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 8, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 September 2016
Laboratory Report No.	16090184		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Method blanks:

Within Criteria	Exceedance/Notes
N	<p>All VOCs except vinyl chloride were detected in the method blank below the reporting limit (RL). Results below the RL were raised to the RL and qualified as non-detect (U). Results above the RL but less than ten times the blank concentration were qualified as estimated with a possible high bias (J+). No qualifications were applied for results greater than ten times the blank concentrations. The following qualifications were applied:</p> <p><u>Flag “J+”:</u> Tetrachloroethene for GRPCE-26-IA- [REDACTED] 1) and GRPCE-29-OA- [REDACTED] trans-1,2-Dichloroethene for GRPCE-26-IA- [REDACTED] 2)</p> <p><u>Raise to RL and flag “U”:</u> cis-1,2-Dichloroethene and trichloroethene for GRPCE-25-IA- [REDACTED] BASEMENT), GRPCE-25-IA- [REDACTED] MAIN), GRPCE-25-IA- [REDACTED] GRPCE-25-IA- [REDACTED] GRPCE-26-IA- [REDACTED] 2) cis-1,2-Dichloroethene, trans-1,2-dichloroethene, and trichloroethene for GRPCE-26-IA- [REDACTED] 1) trans-1,2-Dichloroethene and trichloroethene for GRPCE-29-OA- [REDACTED]</p>

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-25-IA [REDACTED] (BASEMENT)

Date Sampled: 8/31/2016

Lab Number: 006A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.77 psig

Final Pressure: -1.77 psig

Canister ID: 14400

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.21	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	17	0.019	0.16	4.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-25-IA [REDACTED] (MAIN)

Date Sampled: 8/31/2016

Lab Number: 005A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.12 psig

Final Pressure: -2.12 psig

Canister ID: 14142

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.030	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.5	0.019	0.16	1.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-25-IA- (REDACTED) BASEMENT)

Date Sampled: 8/31/2016

Lab Number: 004A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.28 psig

Final Pressure: -1.28 psig

Canister ID: 13992

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.010	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.6	0.036	0.27	0.24	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	13	0.019	0.16	3.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

–, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-25-IA- [REDACTED]

Date Sampled: 8/31/2016

Lab Number: 003A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.72 psig

Final Pressure: -1.72 psig

Canister ID: 14153

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	1.5	0.036	0.27	0.22	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	14	0.019	0.16	3.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-26-IA-██████1)

Date Sampled: 8/31/2016

Lab Number: 001A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.19 psig

Final Pressure: -2.19 psig

Canister ID: 13991

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079	0.024	0.16	0.020	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.41 J+	0.036	0.27	0.060 J+	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	0.079	0.019	0.16	0.020	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-26-IA-[REDACTED] 2)

Date Sampled: 8/31/2016

Lab Number: 002A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/2/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.72 psig

Final Pressure: -1.72 psig

Canister ID: 14293

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040	0.024	0.16	0.010	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.16 J+	0.019	0.16	0.040 J+	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090184

Sample Identification GRPCE-29-OA [REDACTED]

Date Sampled: 8/31/2016

Lab Number: 007A

Date Received: 9/2/2016

Sample Type: Air, Can

Analysis Date: 9/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: psig

Final Pressure: -1.76 psig

Canister ID: 14466

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27 J+	0.036	0.27	0.040 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.048	0.019	0.16	0.010	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
09/08/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1063E		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 8, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 9 September 2016
Laboratory Report No.	1609003	Laboratory	Eurofins-Air Toxics/Folsom, CA
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.50x: GRPCE-03-IA-[REDACTED] 2 nd Floor-N) 1.73x: GRPCE-04-IA-[REDACTED] Basement-S) 1.51x: GRPCE-03-IA-[REDACTED] SFR) 1.74x: GRPCE-03-IA-[REDACTED] Main-Common) 1.57x: GRPCE-03-IA-[REDACTED] 2 nd Floor-W) 1.82x: GRPCE-04-IA-[REDACTED] Basement-W) 1.72x: GRPCE-04-IA-[REDACTED] Basement-N)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609003

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-03-IA-██████████ (2nd Floor-N)	Vinyl Chloride	ND		0.039	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (2nd Floor-N)	trans-1,2-Dichloroethene	ND		0.035	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (2nd Floor-N)	cis-1,2-Dichloroethene	ND		0.049	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (2nd Floor-N)	Trichloroethene	ND		0.050	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (2nd Floor-N)	Tetrachloroethene	0.077	J	0.024	0.15	PPBV	0.077	J
GRPCE-03-IA-██████████ (2nd Floor-N)	Vinyl Chloride	ND		0.10	0.38	UG/M3	0.38	U
GRPCE-03-IA-██████████ (2nd Floor-N)	trans-1,2-Dichloroethene	ND		0.14	0.59	UG/M3	0.59	U
GRPCE-03-IA-██████████ (2nd Floor-N)	cis-1,2-Dichloroethene	ND		0.19	0.59	UG/M3	0.59	U
GRPCE-03-IA-██████████ (2nd Floor-N)	Trichloroethene	ND		0.27	0.81	UG/M3	0.81	U
GRPCE-03-IA-██████████ (2nd Floor-N)	Tetrachloroethene	0.52	J	0.16	1.0	UG/M3	0.52	J
GRPCE-03-IA-██████████ (2nd Floor-W)	Vinyl Chloride	ND		0.041	0.16	PPBV	0.16	U
GRPCE-03-IA-██████████ (2nd Floor-W)	trans-1,2-Dichloroethene	ND		0.036	0.16	PPBV	0.16	U
GRPCE-03-IA-██████████ (2nd Floor-W)	cis-1,2-Dichloroethene	ND		0.051	0.16	PPBV	0.16	U
GRPCE-03-IA-██████████ (2nd Floor-W)	Trichloroethene	ND		0.053	0.16	PPBV	0.16	U
GRPCE-03-IA-██████████ (2nd Floor-W)	Tetrachloroethene	0.093	J	0.025	0.16	PPBV	0.093	J
GRPCE-03-IA-██████████ (2nd Floor-W)	Vinyl Chloride	ND		0.10	0.40	UG/M3	0.40	U
GRPCE-03-IA-██████████ (2nd Floor-W)	trans-1,2-Dichloroethene	ND		0.14	0.62	UG/M3	0.62	U
GRPCE-03-IA-██████████ (2nd Floor-W)	cis-1,2-Dichloroethene	ND		0.20	0.62	UG/M3	0.62	U
GRPCE-03-IA-██████████ (2nd Floor-W)	Trichloroethene	ND		0.28	0.84	UG/M3	0.84	U
GRPCE-03-IA-██████████ (2nd Floor-W)	Tetrachloroethene	0.63	J	0.17	1.1	UG/M3	0.63	J
GRPCE-03-IA-██████████ (Main-Common)	Vinyl Chloride	ND		0.046	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Main-Common)	trans-1,2-Dichloroethene	ND		0.040	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Main-Common)	cis-1,2-Dichloroethene	ND		0.057	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Main-Common)	Trichloroethene	ND		0.058	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Main-Common)	Tetrachloroethene	0.16	J	0.028	0.17	PPBV	0.16	J
GRPCE-03-IA-██████████ (Main-Common)	Vinyl Chloride	ND		0.12	0.44	UG/M3	0.44	U
GRPCE-03-IA-██████████ (Main-Common)	trans-1,2-Dichloroethene	ND		0.16	0.69	UG/M3	0.69	U
GRPCE-03-IA-██████████ (Main-Common)	cis-1,2-Dichloroethene	ND		0.22	0.69	UG/M3	0.69	U
GRPCE-03-IA-██████████ (Main-Common)	Trichloroethene	ND		0.31	0.94	UG/M3	0.94	U
GRPCE-03-IA-██████████ (Main-Common)	Tetrachloroethene	1.1	J	0.19	1.2	UG/M3	1.1	J
GRPCE-03-IA-██████████ (SFR)	Vinyl Chloride	ND		0.040	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (SFR)	trans-1,2-Dichloroethene	ND		0.035	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (SFR)	cis-1,2-Dichloroethene	ND		0.049	0.15	PPBV	0.15	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609003

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-03-IA-██████████ (SFR)	Trichloroethene	ND		0.051	0.15	PPBV	0.15	U
GRPCE-03-IA-██████████ (SFR)	Tetrachloroethene	0.11	J	0.024	0.15	PPBV	0.11	J
GRPCE-03-IA-██████████ (SFR)	Vinyl Chloride	ND		0.10	0.38	UG/M3	0.38	U
GRPCE-03-IA-██████████ (SFR)	trans-1,2-Dichloroethene	ND		0.14	0.60	UG/M3	0.60	U
GRPCE-03-IA-██████████ (SFR)	cis-1,2-Dichloroethene	ND		0.20	0.60	UG/M3	0.60	U
GRPCE-03-IA-██████████ (SFR)	Trichloroethene	ND		0.27	0.81	UG/M3	0.81	U
GRPCE-03-IA-██████████ (SFR)	Tetrachloroethene	0.72	J	0.16	1.0	UG/M3	0.72	J
GRPCE-04-IA-██████████ (Basement-N)	Vinyl Chloride	ND		0.045	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement-N)	trans-1,2-Dichloroethene	ND		0.040	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement-N)	cis-1,2-Dichloroethene	ND		0.056	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement-N)	Trichloroethene	ND		0.058	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement-N)	Tetrachloroethene	0.52		0.027	0.17	PPBV	0.52	
GRPCE-04-IA-██████████ (Basement-N)	Vinyl Chloride	ND		0.12	0.44	UG/M3	0.44	U
GRPCE-04-IA-██████████ (Basement-N)	trans-1,2-Dichloroethene	ND		0.16	0.68	UG/M3	0.68	U
GRPCE-04-IA-██████████ (Basement-N)	cis-1,2-Dichloroethene	ND		0.22	0.68	UG/M3	0.68	U
GRPCE-04-IA-██████████ (Basement-N)	Trichloroethene	ND		0.31	0.92	UG/M3	0.92	U
GRPCE-04-IA-██████████ (Basement-N)	Tetrachloroethene	3.6		0.19	1.2	UG/M3	3.6	
GRPCE-03-IA-██████████ (Basement-S)	Vinyl Chloride	ND		0.045	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Basement-S)	trans-1,2-Dichloroethene	ND		0.040	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Basement-S)	cis-1,2-Dichloroethene	ND		0.056	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Basement-S)	Trichloroethene	ND		0.058	0.17	PPBV	0.17	U
GRPCE-03-IA-██████████ (Basement-S)	Tetrachloroethene	0.41		0.028	0.17	PPBV	0.41	
GRPCE-03-IA-██████████ (Basement-S)	Vinyl Chloride	ND		0.12	0.44	UG/M3	0.44	U
GRPCE-03-IA-██████████ (Basement-S)	trans-1,2-Dichloroethene	ND		0.16	0.68	UG/M3	0.68	U
GRPCE-03-IA-██████████ (Basement-S)	cis-1,2-Dichloroethene	ND		0.22	0.68	UG/M3	0.68	U
GRPCE-03-IA-██████████ (Basement-S)	Trichloroethene	ND		0.31	0.93	UG/M3	0.93	U
GRPCE-03-IA-██████████ (Basement-S)	Tetrachloroethene	2.8		0.19	1.2	UG/M3	2.8	
GRPCE-03-IA-██████████ (Basement-W)	Vinyl Chloride	ND		0.048	0.18	PPBV	0.18	U
GRPCE-03-IA-██████████ (Basement-W)	trans-1,2-Dichloroethene	ND		0.042	0.18	PPBV	0.18	U
GRPCE-03-IA-██████████ (Basement-W)	cis-1,2-Dichloroethene	ND		0.059	0.18	PPBV	0.18	U
GRPCE-03-IA-██████████ (Basement-W)	Trichloroethene	ND		0.061	0.18	PPBV	0.18	U
GRPCE-03-IA-██████████ (Basement-W)	Tetrachloroethene	0.29		0.029	0.18	PPBV	0.29	
GRPCE-03-IA-██████████ (Basement-W)	Vinyl Chloride	ND		0.12	0.46	UG/M3	0.46	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609003

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-03-IA- [REDACTED] (Basement-W)	trans-1,2-Dichloroethene	ND		0.17	0.72	UG/M3	0.72	U
GRPCE-03-IA- [REDACTED] (Basement-W)	cis-1,2-Dichloroethene	ND		0.24	0.72	UG/M3	0.72	U
GRPCE-03-IA- [REDACTED] (Basement-W)	Trichloroethene	ND		0.33	0.98	UG/M3	0.98	U
GRPCE-03-IA- [REDACTED] (Basement-W)	Tetrachloroethene	2.0		0.20	1.2	UG/M3	2.0	



September 14, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1078**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for seven air samples collected at the Grand Rapids VI ER site. The samples were collected on August 10 and September 2, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on September 12, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
EUROFINS-AIR TOXICS SDGS 1608165 AND 1609044**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1078A		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 14, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 14 September 2016
Laboratory Report No.	1608165	Laboratory	Eurofins-Air Toxics/Folsom, CA
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	One air sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The continuing calibration verification was outside of acceptance limits for tetrachloroethene; therefore, the associated result was qualified as estimated (J).

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.60x: GRPCE-01-SS- [REDACTED]

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1608165

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-SS-	Vinyl Chloride		ND	0.044	0.16	PPBV	0.16	U
GRPCE-01-SS-	trans-1,2-Dichloroethene		ND	0.060	0.16	PPBV	0.16	U
GRPCE-01-SS-	cis-1,2-Dichloroethene		ND	0.036	0.16	PPBV	0.16	U
GRPCE-01-SS-	Trichloroethene	0.079	J	0.035	0.16	PPBV	0.079	J
GRPCE-01-SS-	Tetrachloroethene	36		0.025	0.16	PPBV	36	J
GRPCE-01-SS-	Vinyl Chloride		ND	0.11	0.41	UG/M3	0.41	U
GRPCE-01-SS-	trans-1,2-Dichloroethene		ND	0.24	0.63	UG/M3	0.63	U
GRPCE-01-SS-	cis-1,2-Dichloroethene		ND	0.14	0.63	UG/M3	0.63	U
GRPCE-01-SS-	Trichloroethene	0.42	J	0.19	0.86	UG/M3	0.42	J
GRPCE-01-SS-	Tetrachloroethene	240		0.17	1.1	UG/M3	240	J

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1078B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 14, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 14 September 2016
Laboratory Report No.	1609044		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Six air samples		
Field Duplicate Pairs	None		
Field Blanks	None		
Laboratory	Eurofins-Air Toxics/Folsom, CA		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The continuing calibration verification was outside of acceptance limits for cis-1,2-dichloroethene; therefore, all results for cis-1,2-dichloroethene (all non-detects) were qualified as estimated (UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.61x: GRPCE-04-IA-[REDACTED] (SFR) and GRPCE-05-IA-[REDACTED] (Basement-N) 1.62x: GRPCE-04-IA-[REDACTED] (Main-Common) 1.66x: GRPCE-04-IA-[REDACTED] (Basement-S) 1.65x: GRPCE-04-IA-[REDACTED] (2 nd Floor-N) 1.69x: GRPCE-04-IA-[REDACTED] (2 nd Floor-N)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609044

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-04-IA-██████████ (2nd Floor-N)	Vinyl Chloride	ND		0.043	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (2nd Floor-N)	trans-1,2-Dichloroethene	ND		0.038	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (2nd Floor-N)	cis-1,2-Dichloroethene	ND		0.054	0.16	PPBV	0.16	UJ
GRPCE-04-IA-██████████ (2nd Floor-N)	Trichloroethene	0.090	J	0.055	0.16	PPBV	0.090	J
GRPCE-04-IA-██████████ (2nd Floor-N)	Tetrachloroethene	0.074	J	0.026	0.16	PPBV	0.074	J
GRPCE-04-IA-██████████ (2nd Floor-N)	Vinyl Chloride	ND		0.11	0.42	UG/M3	0.42	U
GRPCE-04-IA-██████████ (2nd Floor-N)	trans-1,2-Dichloroethene	ND		0.15	0.65	UG/M3	0.65	U
GRPCE-04-IA-██████████ (2nd Floor-N)	cis-1,2-Dichloroethene	ND		0.21	0.65	UG/M3	0.65	UJ
GRPCE-04-IA-██████████ (2nd Floor-N)	Trichloroethene	0.48	J	0.30	0.89	UG/M3	0.48	J
GRPCE-04-IA-██████████ (2nd Floor-N)	Tetrachloroethene	0.50	J	0.18	1.1	UG/M3	0.50	J
GRPCE-04-IA-██████████ (Main-Common)	Vinyl Chloride	ND		0.042	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Main-Common)	trans-1,2-Dichloroethene	ND		0.038	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Main-Common)	cis-1,2-Dichloroethene	ND		0.053	0.16	PPBV	0.16	UJ
GRPCE-04-IA-██████████ (Main-Common)	Trichloroethene	ND		0.054	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Main-Common)	Tetrachloroethene	0.15	J	0.026	0.16	PPBV	0.15	J
GRPCE-04-IA-██████████ (Main-Common)	Vinyl Chloride	ND		0.11	0.41	UG/M3	0.41	U
GRPCE-04-IA-██████████ (Main-Common)	trans-1,2-Dichloroethene	ND		0.15	0.64	UG/M3	0.64	U
GRPCE-04-IA-██████████ (Main-Common)	cis-1,2-Dichloroethene	ND		0.21	0.64	UG/M3	0.64	UJ
GRPCE-04-IA-██████████ (Main-Common)	Trichloroethene	ND		0.29	0.87	UG/M3	0.87	U
GRPCE-04-IA-██████████ (Main-Common)	Tetrachloroethene	1.0	J	0.18	1.1	UG/M3	1.0	J
GRPCE-04-IA-██████████ (SFR)	Vinyl Chloride	ND		0.042	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (SFR)	trans-1,2-Dichloroethene	ND		0.037	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (SFR)	cis-1,2-Dichloroethene	ND		0.052	0.16	PPBV	0.16	UJ
GRPCE-04-IA-██████████ (SFR)	Trichloroethene	ND		0.054	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (SFR)	Tetrachloroethene	0.11	J	0.026	0.16	PPBV	0.11	J
GRPCE-04-IA-██████████ (SFR)	Vinyl Chloride	ND		0.11	0.41	UG/M3	0.41	U
GRPCE-04-IA-██████████ (SFR)	trans-1,2-Dichloroethene	ND		0.15	0.64	UG/M3	0.64	U
GRPCE-04-IA-██████████ (SFR)	cis-1,2-Dichloroethene	ND		0.21	0.64	UG/M3	0.64	UJ
GRPCE-04-IA-██████████ (SFR)	Trichloroethene	ND		0.29	0.86	UG/M3	0.86	U
GRPCE-04-IA-██████████ (SFR)	Tetrachloroethene	0.74	J	0.17	1.1	UG/M3	0.74	J
GRPCE-05-IA-██████████ (Basement-N)	Vinyl Chloride	ND		0.042	0.16	PPBV	0.16	U
GRPCE-05-IA-██████████ (Basement-N)	trans-1,2-Dichloroethene	ND		0.037	0.16	PPBV	0.16	U
GRPCE-05-IA-██████████ (Basement-N)	cis-1,2-Dichloroethene	ND		0.052	0.16	PPBV	0.16	UJ

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609044

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-05-IA-██████████	(Basement-N) Trichloroethene	ND		0.054	0.16	PPBV	0.16	U
GRPCE-05-IA-██████████	(Basement-N) Tetrachloroethene	0.54		0.026	0.16	PPBV	0.54	
GRPCE-05-IA-██████████	(Basement-N) Vinyl Chloride	ND		0.11	0.41	UG/M3	0.41	U
GRPCE-05-IA-██████████	(Basement-N) trans-1,2-Dichloroethene	ND		0.15	0.64	UG/M3	0.64	U
GRPCE-05-IA-██████████	(Basement-N) cis-1,2-Dichloroethene	ND		0.21	0.64	UG/M3	0.64	UJ
GRPCE-05-IA-██████████	(Basement-N) Trichloroethene	ND		0.29	0.86	UG/M3	0.86	U
GRPCE-05-IA-██████████	(Basement-N) Tetrachloroethene	3.6		0.17	1.1	UG/M3	3.6	
GRPCE-04-IA-██████████	(Basement-S) Vinyl Chloride	ND		0.044	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-S) trans-1,2-Dichloroethene	ND		0.038	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-S) cis-1,2-Dichloroethene	ND		0.054	0.17	PPBV	0.17	UJ
GRPCE-04-IA-██████████	(Basement-S) Trichloroethene	ND		0.056	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-S) Tetrachloroethene	0.40		0.026	0.17	PPBV	0.40	
GRPCE-04-IA-██████████	(Basement-S) Vinyl Chloride	ND		0.11	0.42	UG/M3	0.42	U
GRPCE-04-IA-██████████	(Basement-S) trans-1,2-Dichloroethene	ND		0.15	0.66	UG/M3	0.66	U
GRPCE-04-IA-██████████	(Basement-S) cis-1,2-Dichloroethene	ND		0.21	0.66	UG/M3	0.66	UJ
GRPCE-04-IA-██████████	(Basement-S) Trichloroethene	ND		0.30	0.89	UG/M3	0.89	U
GRPCE-04-IA-██████████	(Basement-S) Tetrachloroethene	2.7		0.18	1.1	UG/M3	2.7	
GRPCE-04-IA-██████████	(Basement-W) Vinyl Chloride	ND		0.044	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-W) trans-1,2-Dichloroethene	ND		0.039	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-W) cis-1,2-Dichloroethene	ND		0.055	0.17	PPBV	0.17	UJ
GRPCE-04-IA-██████████	(Basement-W) Trichloroethene	ND		0.057	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement-W) Tetrachloroethene	0.29		0.027	0.17	PPBV	0.29	
GRPCE-04-IA-██████████	(Basement-W) Vinyl Chloride	ND		0.11	0.43	UG/M3	0.43	U
GRPCE-04-IA-██████████	(Basement-W) trans-1,2-Dichloroethene	ND		0.16	0.67	UG/M3	0.67	U
GRPCE-04-IA-██████████	(Basement-W) cis-1,2-Dichloroethene	ND		0.22	0.67	UG/M3	0.67	UJ
GRPCE-04-IA-██████████	(Basement-W) Trichloroethene	ND		0.30	0.91	UG/M3	0.91	U
GRPCE-04-IA-██████████	(Basement-W) Tetrachloroethene	2.0		0.18	1.1	UG/M3	2.0	



September 21, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1084**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for ten air samples collected at the Grand Rapids VI ER site. The samples were collected on September 8, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on September 15, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
EUROFINS-AIR TOXICS SDG 1609253**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1084	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 20 September 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> September 19, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1609253	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Ten air samples		
Field Duplicate Pairs	GRPCE-04-IA- [REDACTED] (Basement)/GRPCE-04-IA- [REDACTED] (Basement)-DP and GRPCE-05-IA- [REDACTED] GRPCE-05-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	Duplicate sample GRPCE-04-IA- [REDACTED] (Basement)-DP was logged in as GRPCE-04-IA- [REDACTED] (Basemnt by the laboratory. The sample identifier was corrected in the attachment to this validation checklist.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent difference for trans-1,2-dichloroethene for the calibration performed on 09/13/16 exceeded the acceptance limit; therefore, the non-detect trans-1,2-dichloroethene results for samples GRPCE-04-IA-██████████ (Main), GRPCE-04-IA-██████████ (Basement), GRPCE-04-IA-██████████ (Basement), and GRPCE-04-IA-1158 were qualified as estimated (UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
N	<p>GRPCE-04-IA- [REDACTED] (Basement): Recovery for 4-bromofluorobenzene was above the acceptance limit; therefore, the tetrachloroethene result was qualified as estimated with a possible high bias (J+). No further qualifications were applied because the associated results were non-detect.</p> <p>GRPCE-04-IA- [REDACTED] (Main): Recovery for 4-bromofluorobenzene was above the acceptance limit; therefore, the tetrachloroethene and trichloroethene results were qualified as estimated with a possible high bias (J+). No further qualifications were applied because the associated results were non-detect.</p>

MS/MSD:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.36x: GRPCE-04-IA-[REDACTED] (Basement)-DP 1.58x: GRPCE-04-IA-[REDACTED] (Main), GRPCE-04-IA-[REDACTED] (Basement), and GRPCE-04-IA-[REDACTED] (Basement) 1.67x: GRPCE-04-IA-[REDACTED] (Basement) and GRPCE-04-IA-1158 3.16x: GRPCE-05-IA-[REDACTED] 3.38x: GRPCE-04-IA-[REDACTED] (Main) 3.32x: GRPCE-05-IA-[REDACTED] DP 15.7x: GRPCE-04-IA-[REDACTED] (Main)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609253

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-04-IA-██████████ (Main)	Vinyl Chloride	ND		0.43	1.6	PPBV	1.6	U
GRPCE-04-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		0.59	1.6	PPBV	1.6	UJ
GRPCE-04-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		0.35	1.6	PPBV	1.6	U
GRPCE-04-IA-██████████ (Main)	Trichloroethene	ND		0.34	1.6	PPBV	1.6	U
GRPCE-04-IA-██████████ (Main)	Tetrachloroethene	ND		0.25	1.6	PPBV	1.6	U
GRPCE-04-IA-██████████ (Main)	Vinyl Chloride	ND		1.1	4.0	UG/M3	4.0	U
GRPCE-04-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		2.3	6.2	UG/M3	6.2	UJ
GRPCE-04-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		1.4	6.2	UG/M3	6.2	U
GRPCE-04-IA-██████████ (Main)	Trichloroethene	ND		1.8	8.4	UG/M3	8.4	U
GRPCE-04-IA-██████████ (Main)	Tetrachloroethene	ND		1.7	11	UG/M3	11	U
GRPCE-04-IA-██████████ (Basement)	Vinyl Chloride	ND		0.035	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Basement)	trans-1,2-Dichloroethene	ND		0.047	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Basement)	cis-1,2-Dichloroethene	ND		0.045	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████ (Basement)	Trichloroethene	0.069	J	0.047	0.16	PPBV	0.069	J
GRPCE-04-IA-██████████ (Basement)	Tetrachloroethene	0.23		0.043	0.16	PPBV	0.23	
GRPCE-04-IA-██████████ (Basement)	Vinyl Chloride	ND		0.090	0.40	UG/M3	0.40	U
GRPCE-04-IA-██████████ (Basement)	trans-1,2-Dichloroethene	ND		0.19	0.63	UG/M3	0.63	U
GRPCE-04-IA-██████████ (Basement)	cis-1,2-Dichloroethene	ND		0.18	0.63	UG/M3	0.63	U
GRPCE-04-IA-██████████ (Basement)	Trichloroethene	0.37	J	0.25	0.85	UG/M3	0.37	J
GRPCE-04-IA-██████████ (Basement)	Tetrachloroethene	1.5		0.29	1.1	UG/M3	1.5	
GRPCE-04-IA-██████████ (Main)	Vinyl Chloride	ND		0.075	0.34	PPBV	0.34	U
GRPCE-04-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		0.10	0.34	PPBV	0.34	U
GRPCE-04-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		0.097	0.34	PPBV	0.34	U
GRPCE-04-IA-██████████ (Main)	Trichloroethene	ND		0.10	0.34	PPBV	0.34	U
GRPCE-04-IA-██████████ (Main)	Tetrachloroethene	0.16	J	0.092	0.34	PPBV	0.16	J
GRPCE-04-IA-██████████ (Main)	Vinyl Chloride	ND		0.19	0.86	UG/M3	0.86	U
GRPCE-04-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		0.40	1.3	UG/M3	1.3	U
GRPCE-04-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		0.38	1.3	UG/M3	1.3	U
GRPCE-04-IA-██████████ (Main)	Trichloroethene	ND		0.54	1.8	UG/M3	1.8	U
GRPCE-04-IA-██████████ (Main)	Tetrachloroethene	1.1	J	0.63	2.3	UG/M3	1.1	J
GRPCE-04-IA-██████████ (Basement)	Vinyl Chloride	ND		0.037	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement)	trans-1,2-Dichloroethene	ND		0.050	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████ (Basement)	cis-1,2-Dichloroethene	ND		0.048	0.17	PPBV	0.17	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609253

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-04-IA-██████████	(Basement) Trichloroethene		ND	0.050	0.17	PPBV	0.17	U
GRPCE-04-IA-██████████	(Basement) Tetrachloroethene	0.50		0.046	0.17	PPBV	0.50	J+
GRPCE-04-IA-██████████	(Basement) Vinyl Chloride		ND	0.095	0.43	UG/M3	0.43	U
GRPCE-04-IA-██████████	(Basement) trans-1,2-Dichloroethene		ND	0.20	0.66	UG/M3	0.66	U
GRPCE-04-IA-██████████	(Basement) cis-1,2-Dichloroethene		ND	0.19	0.66	UG/M3	0.66	U
GRPCE-04-IA-██████████	(Basement) Trichloroethene		ND	0.27	0.90	UG/M3	0.90	U
GRPCE-04-IA-██████████	(Basement) Tetrachloroethene	3.4		0.31	1.1	UG/M3	3.4	J+
GRPCE-04-IA-██████████	(Main) Vinyl Chloride		ND	0.035	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████	(Main) trans-1,2-Dichloroethene		ND	0.047	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████	(Main) cis-1,2-Dichloroethene		ND	0.045	0.16	PPBV	0.16	U
GRPCE-04-IA-██████████	(Main) Trichloroethene	0.048	J	0.047	0.16	PPBV	0.048	J+
GRPCE-04-IA-██████████	(Main) Tetrachloroethene	0.091	J	0.043	0.16	PPBV	0.091	J+
GRPCE-04-IA-██████████	(Main) Vinyl Chloride		ND	0.090	0.40	UG/M3	0.40	U
GRPCE-04-IA-██████████	(Main) trans-1,2-Dichloroethene		ND	0.19	0.63	UG/M3	0.63	U
GRPCE-04-IA-██████████	(Main) cis-1,2-Dichloroethene		ND	0.18	0.63	UG/M3	0.63	U
GRPCE-04-IA-██████████	(Main) Trichloroethene	0.26	J	0.25	0.85	UG/M3	0.26	J+
GRPCE-04-IA-██████████	(Main) Tetrachloroethene	0.62	J	0.29	1.1	UG/M3	0.62	J+
GRPCE-05-IA-██████████	Vinyl Chloride		ND	0.070	0.32	PPBV	0.32	U
GRPCE-05-IA-██████████	trans-1,2-Dichloroethene		ND	0.094	0.32	PPBV	0.32	U
GRPCE-05-IA-██████████	cis-1,2-Dichloroethene		ND	0.091	0.32	PPBV	0.32	U
GRPCE-05-IA-██████████	Trichloroethene		ND	0.094	0.32	PPBV	0.32	U
GRPCE-05-IA-██████████	Tetrachloroethene	0.14	J	0.086	0.32	PPBV	0.14	J
GRPCE-05-IA-██████████	Vinyl Chloride		ND	0.18	0.81	UG/M3	0.81	U
GRPCE-05-IA-██████████	trans-1,2-Dichloroethene		ND	0.37	1.2	UG/M3	1.2	U
GRPCE-05-IA-██████████	cis-1,2-Dichloroethene		ND	0.36	1.2	UG/M3	1.2	U
GRPCE-05-IA-██████████	Trichloroethene		ND	0.50	1.7	UG/M3	1.7	U
GRPCE-05-IA-██████████	Tetrachloroethene	0.98	J	0.59	2.1	UG/M3	0.98	J
GRPCE-05-IA-██████████	DP Vinyl Chloride		ND	0.074	0.33	PPBV	0.33	U
GRPCE-05-IA-██████████	DP trans-1,2-Dichloroethene		ND	0.099	0.33	PPBV	0.33	U
GRPCE-05-IA-██████████	DP cis-1,2-Dichloroethene		ND	0.095	0.33	PPBV	0.33	U
GRPCE-05-IA-██████████	DP Trichloroethene		ND	0.099	0.33	PPBV	0.33	U
GRPCE-05-IA-██████████	DP Tetrachloroethene	0.11	J	0.091	0.33	PPBV	0.11	J
GRPCE-05-IA-██████████	DP Vinyl Chloride		ND	0.19	0.85	UG/M3	0.85	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609253

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-05-IA-██████ DP	trans-1,2-Dichloroethene	ND		0.39	1.3	UG/M3	1.3	U
GRPCE-05-IA-██████ DP	cis-1,2-Dichloroethene	ND		0.38	1.3	UG/M3	1.3	U
GRPCE-05-IA-██████ DP	Trichloroethene	ND		0.53	1.8	UG/M3	1.8	U
GRPCE-05-IA-██████ DP	Tetrachloroethene	0.75	J	0.62	2.2	UG/M3	0.75	J
GRPCE-04-IA-██████ (Basement)	Vinyl Chloride	ND		0.043	0.16	PPBV	0.16	U
GRPCE-04-IA-██████ (Basement)	trans-1,2-Dichloroethene	ND		0.059	0.16	PPBV	0.16	UJ
GRPCE-04-IA-██████ (Basement)	cis-1,2-Dichloroethene	ND		0.036	0.16	PPBV	0.16	U
GRPCE-04-IA-██████ (Basement)	Trichloroethene	ND		0.034	0.16	PPBV	0.16	U
GRPCE-04-IA-██████ (Basement)	Tetrachloroethene	0.35		0.025	0.16	PPBV	0.35	
GRPCE-04-IA-██████ (Basement)	Vinyl Chloride	ND		0.11	0.40	UG/M3	0.40	U
GRPCE-04-IA-██████ (Basement)	trans-1,2-Dichloroethene	ND		0.24	0.63	UG/M3	0.63	UJ
GRPCE-04-IA-██████ (Basement)	cis-1,2-Dichloroethene	ND		0.14	0.63	UG/M3	0.63	U
GRPCE-04-IA-██████ (Basement)	Trichloroethene	ND		0.18	0.85	UG/M3	0.85	U
GRPCE-04-IA-██████ (Basement)	Tetrachloroethene	2.4		0.17	1.1	UG/M3	2.4	
GRPCE-04-IA-██████ (Basement)-DP	Vinyl Chloride	ND		0.037	0.14	PPBV	0.14	U
GRPCE-04-IA-██████ (Basement)-DP	trans-1,2-Dichloroethene	ND		0.051	0.14	PPBV	0.14	UJ
GRPCE-04-IA-██████ (Basement)-DP	cis-1,2-Dichloroethene	ND		0.031	0.14	PPBV	0.14	U
GRPCE-04-IA-██████ (Basement)-DP	Trichloroethene	ND		0.030	0.14	PPBV	0.14	U
GRPCE-04-IA-██████ (Basement)-DP	Tetrachloroethene	0.30		0.021	0.14	PPBV	0.30	
GRPCE-04-IA-██████ (Basement)-DP	Vinyl Chloride	ND		0.095	0.35	UG/M3	0.35	U
GRPCE-04-IA-██████ (Basement)-DP	trans-1,2-Dichloroethene	ND		0.20	0.54	UG/M3	0.54	UJ
GRPCE-04-IA-██████ (Basement)-DP	cis-1,2-Dichloroethene	ND		0.12	0.54	UG/M3	0.54	U
GRPCE-04-IA-██████ (Basement)-DP	Trichloroethene	ND		0.16	0.73	UG/M3	0.73	U
GRPCE-04-IA-██████ (Basement)-DP	Tetrachloroethene	2.0		0.14	0.92	UG/M3	2.0	
GRPCE-04-IA-1158	Vinyl Chloride	ND		0.046	0.17	PPBV	0.17	U
GRPCE-04-IA-1158	trans-1,2-Dichloroethene	ND		0.063	0.17	PPBV		UJ
GRPCE-04-IA-1158	cis-1,2-Dichloroethene	ND		0.038	0.17	PPBV		U
GRPCE-04-IA-1158	Trichloroethene	0.10	J	0.036	0.17	PPBV	0.10	J
GRPCE-04-IA-1158	Tetrachloroethene	0.31		0.026	0.17	PPBV	0.31	
GRPCE-04-IA-1158	Vinyl Chloride	ND		0.12	0.43	UG/M3	0.43	U
GRPCE-04-IA-1158	trans-1,2-Dichloroethene	ND		0.25	0.66	UG/M3	0.66	UJ
GRPCE-04-IA-1158	cis-1,2-Dichloroethene	ND		0.15	0.66	UG/M3	0.66	U
GRPCE-04-IA-1158	Trichloroethene	0.54	J	0.20	0.90	UG/M3	0.54	J

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1609253

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-04-IA-1158	Tetrachloroethene	2.1		0.18	1.1	UG/M3	2.1	



October 5, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1115**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 40 air samples (including four field duplicates) collected at the Grand Rapids VI ER site. The samples were collected from September 7 through 27, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on September 30, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
SDGS 16090390, 16090684, 16090873, 16090874, 16091215, AND
16091662**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115A		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 3, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Laboratory Report No.	16090390	Laboratory	Bureau Veritas/Novi, MI
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-27-IA- [REDACTED] 2)/GRPCE-27-IA- [REDACTED] 2)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	Tetrachloroethene was detected in the method blank below the reporting limit (RL). The tetrachloroethene results for GRPCE-27-IA-██████2), GRPCE-27-IA-██████2)-DP, and GRPCE-30-OA-██████ were qualified as estimated with a possible high bias (J+). No further qualifications were required because the associated results were greater than ten times the blank value.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	GRPCE-27-IA- [REDACTED] 1) was analyzed at a 1.48 dilution.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090390
 Sample Identification: GRPCE-26-IA (BASEMENT) Date Sampled: 9/7/2016
 Lab Number: 007A Date Received: 9/7/2016
 Sample Type: Air, Can Analysis Date: 9/8/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.4 psig
 Final Pressure: -1.4 psig
 Canister ID: 14024

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	20	0.019	0.16	5.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 U	ND	0.0088	1	

gaw
10/04/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090390
 Sample Identification GRPCE-26-1A- (REDACTED) (MAIN) Date Sampled: 9/7/2016
 Lab Number: 006A Date Received: 9/7/2016
 Sample Type: Air, Can Analysis Date: 9/8/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.09 psig
 Final Pressure: -1.09 psig
 Canister ID: 14461

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	8.1	0.019	0.16	2.1	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090390
 Sample Identification GRPCE-26-IA-1168(BASEMENT) Date Sampled: 9/7/2016
 Lab Number: 005A Date Received: 9/7/2016
 Sample Type: Air, Can Analysis Date: 9/8/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.97 psig
 Final Pressure: -1.97 psig
 Canister ID: 14537

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.3	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	15	0.019	0.16	3.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090390

Sample Identification GRPCE-26-1A-██████████

Date Sampled: 9/7/2016

Lab Number: 004A

Date Received: 9/7/2016

Sample Type: Air, Can

Analysis Date: 9/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.95 psig

Final Pressure: -1.95 psig

Canister ID: 13963

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.4	0.036	0.27	0.21	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	18	0.019	0.16	4.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 u	ND	0.0088		0.04 u

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10/04/16

General Notes and Qualifiers:

—: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090390

Sample Identification GRPCE-27-1A ()

Date Sampled: 9/7/2016

Lab Number: 001A

Date Received: 9/7/2016

Sample Type: Air, Can

Analysis Date: 9/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -5.8 psig

Final Pressure: -1.6 psig

Canister ID: 13970

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.12 J	0.036	0.23	0.030 J	0.009	0.059	1.48	✓
127-18-4	Tetrachloroethene	0.70	0.053	0.40	0.10	0.0078	0.059	1.48	
156-60-5	trans-1,2-Dichloroethene	0.18 J	0.029	0.23	0.044 J	0.0073	0.059	1.48	
79-01-6	Trichloroethene	0.16 J	0.031	0.32	0.030 J	0.0058	0.059	1.48	
75-01-4	Vinyl Chloride	ND	0.033		0.154	ND	0.013	0.0594	48

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10/04/16

General Notes and Qualifiers:

--: Information not available or not applicable
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090390

Sample Identification GRPCE-27-IA-[REDACTED] 2)

Date Sampled: 9/7/2016

Lab Number: 002A

Date Received: 9/7/2016

Sample Type: Air, Can

Analysis Date: 9/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.94 psig

Final Pressure: -2.94 psig

Canister ID: 14479

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.40 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.47 J+	0.036	0.27	0.070 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079 J	0.019	0.16	0.020 J	0.0049	0.04	1	1
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.

ND; Less than the indicated limit of detection (LOD)

RL; Report Limit

J; Value is between the MDL and Reporting Limit, estimated r

MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank

S; Spike Recovery outside accepted recovery limits

R; RPD outside accepted recovery limits

T; Tentatively Identified Compound (TIC)

E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090390

Sample Identification GRPCE-27-IA-[REDACTED]2)-DP

Date Sampled: 9/7/2016

Lab Number: 003A

Date Received: 9/7/2016

Sample Type: Air, Can

Analysis Date: 9/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.65 psig

Final Pressure: -1.65 psig

Canister ID: 13967

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.41 J+	0.036	0.27	0.060 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12 J	0.019	0.16	0.030 J	0.0049	0.04	1	!
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/04/16

General Notes and Qualifiers:

—, Information not available or not applicable.
 ND, Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 09-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090390

Sample Identification GRPCE-30-OA-1170

Date Sampled: 9/7/2016

Lab Number: 008A

Date Received: 9/7/2016

Sample Type: Air, Can

Analysis Date: 9/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.89 psig

Final Pressure: -1.89 psig

Canister ID: 14040

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.41 J+	0.036	0.27	0.060 J+	0.0053	0.04	1	J
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride		0.022		0.10 U	0.0088	0.04 U		

gaw
10/04/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 4, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Laboratory Report No.	16090684	Laboratory	Bureau Veritas/Novi, MI
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-27-1A ██████████ (BASEMENT)

Date Sampled: 9/11/2016

Lab Number: 006A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.99 psig

Final Pressure: -0.99 psig

Canister ID: 14246

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.9	0.036	0.27	0.28	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	64	0.019	0.16	16	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0038	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

–, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-27-1A- [REDACTED] (MAIN)

Date Sampled: 9/11/2016

Lab Number: 005A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.82 psig

Final Pressure: -1.82 psig

Canister ID: 14404

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.7	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090684
 Sample Identification GRPCE-27-IA- (BASEMENT) Date Sampled: 9/11/2016
 Lab Number: 004A Date Received: 9/12/2016
 Sample Type: Air, Can Analysis Date: 9/12/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.82 psig
 Final Pressure: -1.82 psig
 Canister ID: 14144

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	3.9	0.036	0.27	0.57	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	52	0.019	0.16	13	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-27-1A- [REDACTED]

Date Sampled: 9/11/2016

Lab Number: 003A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.99 psig

Final Pressure: -1.99 psig

Canister ID: 13988

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	2.3	0.036	0.27	0.34	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	24	0.019	0.16	6.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-28-IA-1 (1)

Date Sampled: 9/11/2016

Lab Number: 001A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.35 psig

Final Pressure: -2.35 psig

Canister ID: 14178

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.20	0.019	0.16	0.050	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-28-IA (2)

Date Sampled: 9/11/2016

Lab Number: 002A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.88 psig

Final Pressure: -1.88 psig

Canister ID: 14017

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.59	0.019	0.16	0.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 29-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090684

Sample Identification GRPCE-31-OA [REDACTED]

Date Sampled: 9/11/2016

Lab Number: 007A

Date Received: 9/12/2016

Sample Type: Air, Can

Analysis Date: 9/12/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: psig

Final Pressure: -1.63 psig

Canister ID: 14397

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16u	ND	0.0061	0.04u	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	!
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	!
75-01-4	Vinyl Chloride	ND	0.022	0.10u	ND	0.0088	0.04u	1	

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 4, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16090873	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-28-IA- [REDACTED] GRPCE-28-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873
 Sample Identification GRPCE-29-IA- [REDACTED] Date Sampled: 9/14/2016
 Lab Number: 001A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/14/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.13 psig
 Final Pressure: -2.13 psig
 Canister ID: 14590

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	1
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit
 B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090873

Sample Identification GRPCE-29-1A (redacted) 2)

Date Sampled: 9/14/2016

Lab Number: 002A

Date Received: 9/14/2016

Sample Type: Air, Can

Analysis Date: 9/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.92 psig

Final Pressure: -1.92 psig

Canister ID: 14622

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	1
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
16/04/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873
 Sample Identification GRPCE-28-IA-██████████ Date Sampled: 9/14/2016
 Lab Number: 003A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.90 psig
 Final Pressure: -1.90 psig
 Canister ID: 14006

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.2	0.019	0.16	2.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

gaw
10/04/16

General Notes and Qualifiers:

–, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873

Sample Identification GRPCE-28-1A- (BASEMENT) Date Sampled: 9/14/2016
 Lab Number: 004A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.21 psig
 Final Pressure: -1.21 psig
 Canister ID: 14207

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	11	0.019	0.16	2.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 u	ND	0.0088	0.04 u	1

Jaw
10/04/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873
 Sample Identification GRPCE-28-IA- (BASEMENT)-DP Date Sampled: 9/14/2016
 Lab Number: 005A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.52 psig
 Final Pressure: -1.52 psig
 Canister ID: 14077

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	9.9	0.019	0.16	2.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

–: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873

Sample Identification GRPCE-28-IA [REDACTED] (MAIN) Date Sampled: 9/14/2016
 Lab Number: 006A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.23 psig
 Final Pressure: -1.23 psig
 Canister ID: 14611

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.3	0.019	0.16	1.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16090873

Sample Identification GRPCE-28-IA [REDACTED] BASEMENT Date Sampled: 9/14/2016
 Lab Number: 007A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -2.03 psig
 Final Pressure: -2.03 psig
 Canister ID: 14140

CAS #	Analyte	Results (ug/m³)	MDL (ug/m³)	RL (ug/m³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	12	0.019	0.16	3.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 U	ND	0.0088	0.04 U	1

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10/04/16

General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE
 Work Order No: 16090873

Sample Identification: GRPCE-32-OA [REDACTED] Date Sampled: 9/14/2016
 Lab Number: 008A Date Received: 9/14/2016
 Sample Type: Air, Can Analysis Date: 9/15/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.30 psig
 Final Pressure: -1.30 psig
 Canister ID: 14009

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.164	ND	0.0049	0.044	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0038	0.04	1	

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10/04/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115D		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 4, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Laboratory Report No.	16090874	Laboratory	Bureau Veritas/Novi, MI
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	One air sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 16-Sep-16

Client: TETRA TECH
Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16090874

Sample Identification GRPCE-04-IA- [REDACTED] (MAIN)

Date Sampled: 9/13/2016

Lab Number: 001A

Date Received: 9/14/2016

Sample Type: Air, Can

Analysis Date: 9/15/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.97 psig

Final Pressure: -1.97 psig

Canister ID: 14630

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.20	0.024	0.16	0.050	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	
79-01-6	Trichloroethene	0.27	0.021	0.21	0.050	0.0039	0.04	1	
75-01-4	Vinyl Chloride	0.13	0.022	0.10	0.050	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115E		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 4, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Laboratory Report No.	16091215	Laboratory	Bureau Veritas/Novi, MI
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-29-IA-[REDACTED] BASEMENT)/GRPCE-29-IA-[REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-29-IA- [REDACTED] (BASEMENT)

Date Sampled: 9/20/2016

Lab Number: 006A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.18 psig

Final Pressure: -1.18 psig

Canister ID: 14403

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	10	0.019	0.16	2.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-29-1A- [REDACTED] BASEMENT)-DP

Date Sampled: 9/20/2016

Lab Number: 007A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.36 psig

Final Pressure: -3.36 psig

Canister ID: 14298

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	12	0.019	0.16	3.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-29-IA [REDACTED] (MAIN)

Date Sampled: 9/20/2016

Lab Number: 005A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.09 psig

Final Pressure: -3.09 psig

Canister ID: 14591

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.7	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-29-1A (BASEMENT)

Date Sampled: 9/20/2016

Lab Number: 004A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.96 psig

Final Pressure: -2.96 psig

Canister ID: 14570

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	9.6	0.019	0.16	2.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

gaw
10/04/16

General Notes and Qualifiers:

—: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-29-IA-XXXXXXXXXX (MAIN)

Date Sampled: 9/20/2016

Lab Number: 003A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.33 psig

Final Pressure: -2.33 psig

Canister ID: 14396

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.7	0.019	0.16	1.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-30-IA [REDACTED] 1)

Date Sampled: 9/20/2016

Lab Number: 001A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.85 psig

Final Pressure: -2.85 psig

Canister ID: 13946

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.52	0.024	0.16	0.13	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.28	0.019	0.16	0.070	0.0049	0.04	1	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	0.13	0.022	0.10	0.050	0.0088	0.04	1	

gaw
10/04/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-30-██████████

Date Sampled: 9/20/2016

Lab Number: 002A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.55 psig

Final Pressure: -2.55 psig

Canister ID: 13987

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.36	0.019	0.16	0.090	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 21-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091215

Sample Identification GRPCE-33-OA [REDACTED]

Date Sampled: 9/20/2016

Lab Number: 008A

Date Received: 9/20/2016

Sample Type: Air, Can

Analysis Date: 9/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.05 psig

Final Pressure: -3.05 psig

Canister ID: 13996

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 u	ND	0.0061	0.04 u	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040	0.019	0.16	0.010 J	0.0049	0.04	1	1
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1115F	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 4, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16091662	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-29-IA- [REDACTED] BASEMENT)/GRPCE-29-IA- [REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-30-IA (██████████ BASEMENT)

Date Sampled: 9/27/2016

Lab Number: 006A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.08 psig

Final Pressure: -2.08 psig

Canister ID: 14075

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.6	0.019	0.16	2.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

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10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-30-IA- [REDACTED] (MAIN)

Date Sampled: 9/27/2016

Lab Number: 005A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.52 psig

Final Pressure: -1.52 psig

Canister ID: 14026

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 u	ND	0.0061	0.04 u	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.0	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022		ND	0.0088	0.04 u	1	

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10/04/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification: GRPCE-30-IA-
 Lab Number: 007A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.05 psig
 Final Pressure: -2.05 psig
 Canister ID: 14078

Date Sampled: 9/27/2016
 Date Received: 9/27/2016
 Analysis Date: 9/27/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.9	0.019	0.16	1.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	r
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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10/04/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-30-IA- (MAIN)

Date Sampled: 9/27/2016

Lab Number: 003A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.87 psig

Final Pressure: -1.87 psig

Canister ID: 14291

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 <u>u</u>	ND	0.0061	0.04 <u>u</u>	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.44	0.019	0.16	0.11	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 <u>J</u>	0.021	0.21	0.010 <u>J</u>	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10 <u>u</u>	ND	0.0088	0.04 <u>u</u>		

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-30-IA [REDACTED]-DP

Date Sampled: 9/27/2016

Lab Number: 004A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.35 psig

Final Pressure: -2.35 psig

Canister ID: 14478

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.48	0.019	0.16	0.12	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-31-IA-[REDACTED] 1)

Date Sampled: 9/27/2016

Lab Number: 001A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.44 psig

Final Pressure: -2.44 psig

Canister ID: 14002

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.20	0.024	0.16	0.050	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12	0.019	0.16	0.030	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/04/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-31-IA-[REDACTED] 2)

Date Sampled: 9/27/2016

Lab Number: 002A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.43 psig

Final Pressure: -3.43 psig

Canister ID: 14076

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/04/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 28-Sep-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16091662

Sample Identification GRPCE-34-OA [REDACTED]

Date Sampled: 9/27/2016

Lab Number: 008A

Date Received: 9/27/2016

Sample Type: Air, Can

Analysis Date: 9/27/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.51 psig

Final Pressure: -1.51 psig

Canister ID: 14580

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16 U	ND	0.0049	0.04 U	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/04/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



October 10, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1121**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 19 air samples (including a field duplicate) collected at the Grand Rapids VI ER site. The samples were collected on September 29, 2016 and October 2, 2016 and were analyzed for volatile organic compounds by ALS Environmental Laboratories and Bureau Veritas Laboratories. Tetra Tech received the final data on October 7, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for these data sets. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
ALS ENVIRONMENTAL SDG P1604646
BUREAU VERITAS SDG 16100012**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1121A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 10 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 10, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1604646	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Twelve air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-01-IA- [REDACTED] (Basement)/GRPCE-01- IA- [REDACTED] (Basement)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.62x: VOCs for GRPCE-01-IA-1232 Euclid (Basement) 1.63x: VOCs for GRPCE-01-IA-1232 Euclid (Main) 1.65x: VOCs for GRPCE-01-IA-██████████ (Basement)-DP and GRPCE-01-IA-██████████ (Main) 1.66x: VOCs for GRPCE-01-IA-██████████ (Basement) 1.70x: VOCs for GRPCE-01-IA-██████████ (Main) and GRPCE-01-IA-██████████ (Basement) 1.71x: VOCs for GRPCE-01-IA-██████████ (Main) 1.74x: VOCs for GRPCE-01-SS-██████████ 8.65x: VOCs for GRPCE-01-SS-██████████ 23.5x: VOCs except tetrachloroethene for GRPCE-01-SS-1232 Euclid 49.4x: VOCs for GRPCE-01-SS-██████████ 51.0x: tetrachloroethene for GRPCE-01-SS-1232 Euclid

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604646

Samp_No		Analyte	Result	Lab_Qualifier	MDL	RL	Units	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.043	U	0.039	0.043	ppbV	0.043	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.049		0.018	0.025	ppbV	0.049	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.043	U	0.039	0.043	ppbV	0.043	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.032	U	0.028	0.032	ppbV	0.032	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.067	U	0.063	0.067	ppbV	0.067	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.33		0.12	0.17	ug/m3	0.33	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.043	U	0.04	0.043	ppbV	0.043	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.051		0.018	0.025	ppbV	0.051	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.043	U	0.039	0.043	ppbV	0.043	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.032	U	0.028	0.032	ppbV	0.032	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.067	U	0.064	0.067	ppbV	0.067	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.35		0.12	0.17	ug/m3	0.35	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.042	U	0.039	0.042	ppbV	0.042	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	1.1		0.018	0.024	ppbV	1.1	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.031	U	0.028	0.031	ppbV	0.031	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.065	U	0.062	0.065	ppbV	0.065	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	7.1		0.12	0.17	ug/m3	7.1	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-IA-	(Basement)-DP	cis-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	U
GRPCE-01-IA-	(Basement)-DP	Tetrachloroethene	1.2		0.018	0.024	ppbV	1.2	
GRPCE-01-IA-	(Basement)-DP	trans-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604646

Samp_No	Analyte	Result	Lab_Qualifier	MDL	RL	Units	Val_Result	Val_Qualifier
GRPCE-01-IA-██████████	(Basement)-DP Trichloroethene (TCE)	0.031 U		0.027	0.031	ppbV	0.031 U	
GRPCE-01-IA-██████████	(Basement)-DP Vinyl Chloride	0.065 U		0.061	0.065	ppbV	0.065 U	
GRPCE-01-IA-██████████	(Basement)-DP cis-1,2-Dichloroethene	0.17 U		0.15	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Basement)-DP Tetrachloroethene	8.4		0.12	0.17	ug/m3	8.4	
GRPCE-01-IA-██████████	(Basement)-DP trans-1,2-Dichloroethene	0.17 U		0.15	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Basement)-DP Trichloroethene (TCE)	0.17 U		0.15	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Basement)-DP Vinyl Chloride	0.17 U		0.16	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Main) cis-1,2-Dichloroethene	0.043 U		0.039	0.043	ppbV	0.043 U	
GRPCE-01-IA-██████████	(Main) Tetrachloroethene	0.47		0.018	0.025	ppbV	0.47	
GRPCE-01-IA-██████████	(Main) trans-1,2-Dichloroethene	0.043 U		0.039	0.043	ppbV	0.043 U	
GRPCE-01-IA-██████████	(Main) Trichloroethene (TCE)	0.032 U		0.028	0.032	ppbV	0.032 U	
GRPCE-01-IA-██████████	(Main) Vinyl Chloride	0.067 U		0.063	0.067	ppbV	0.067 U	
GRPCE-01-IA-██████████	(Main) cis-1,2-Dichloroethene	0.17 U		0.16	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Main) Tetrachloroethene	3.2		0.12	0.17	ug/m3	3.2	
GRPCE-01-IA-██████████	(Main) trans-1,2-Dichloroethene	0.17 U		0.15	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Main) Trichloroethene (TCE)	0.17 U		0.15	0.17	ug/m3	0.17 U	
GRPCE-01-IA-██████████	(Main) Vinyl Chloride	0.17 U		0.16	0.17	ug/m3	0.17 U	
GRPCE-01-IA-1232 Euclid (Basement)	cis-1,2-Dichloroethene	0.041 U		0.038	0.041	ppbV	0.041 U	
GRPCE-01-IA-1232 Euclid (Basement)	Tetrachloroethene	0.77		0.017	0.024	ppbV	0.77	
GRPCE-01-IA-1232 Euclid (Basement)	trans-1,2-Dichloroethene	0.041 U		0.037	0.041	ppbV	0.041 U	
GRPCE-01-IA-1232 Euclid (Basement)	Trichloroethene (TCE)	0.03 U		0.027	0.03	ppbV	0.03 U	
GRPCE-01-IA-1232 Euclid (Basement)	Vinyl Chloride	0.063 U		0.06	0.063	ppbV	0.063 U	
GRPCE-01-IA-1232 Euclid (Basement)	cis-1,2-Dichloroethene	0.16 U		0.15	0.16	ug/m3	0.16 U	
GRPCE-01-IA-1232 Euclid (Basement)	Tetrachloroethene	5.2		0.12	0.16	ug/m3	5.2	
GRPCE-01-IA-1232 Euclid (Basement)	trans-1,2-Dichloroethene	0.16 U		0.15	0.16	ug/m3	0.16 U	
GRPCE-01-IA-1232 Euclid (Basement)	Trichloroethene (TCE)	0.16 U		0.14	0.16	ug/m3	0.16 U	
GRPCE-01-IA-1232 Euclid (Basement)	Vinyl Chloride	0.16 U		0.15	0.16	ug/m3	0.16 U	
GRPCE-01-IA-1232 Euclid (Main)	cis-1,2-Dichloroethene	0.041 U		0.038	0.041	ppbV	0.041 U	
GRPCE-01-IA-1232 Euclid (Main)	Tetrachloroethene	0.57		0.017	0.024	ppbV	0.57	
GRPCE-01-IA-1232 Euclid (Main)	trans-1,2-Dichloroethene	0.041 U		0.037	0.041	ppbV	0.041 U	
GRPCE-01-IA-1232 Euclid (Main)	Trichloroethene (TCE)	0.03 U		0.027	0.03	ppbV	0.03 U	
GRPCE-01-IA-1232 Euclid (Main)	Vinyl Chloride	0.064 U		0.061	0.064	ppbV	0.064 U	
GRPCE-01-IA-1232 Euclid (Main)	cis-1,2-Dichloroethene	0.16 U		0.15	0.16	ug/m3	0.16 U	

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604646

Samp_No	Analyte	Result	Lab_Qualifier	MDL	RL	Units	Val_Result	Val_Qualifier
GRPCE-01-IA-1232 Euclid (Main)	Tetrachloroethene	3.9		0.12	0.16	ug/m3	3.9	
GRPCE-01-IA-1232 Euclid (Main)	trans-1,2-Dichloroethene	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-01-IA-1232 Euclid (Main)	Trichloroethene (TCE)	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-01-IA-1232 Euclid (Main)	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-01-IA- (Main)	cis-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	U
GRPCE-01-IA- (Main)	Tetrachloroethene	0.93		0.018	0.024	ppbV	0.93	
GRPCE-01-IA- (Main)	trans-1,2-Dichloroethene	0.042	U	0.038	0.042	ppbV	0.042	U
GRPCE-01-IA- (Main)	Trichloroethene (TCE)	0.15		0.027	0.031	ppbV	0.15	
GRPCE-01-IA- (Main)	Vinyl Chloride	0.065	U	0.061	0.065	ppbV	0.065	U
GRPCE-01-IA- (Main)	cis-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA- (Main)	Tetrachloroethene	6.3		0.12	0.17	ug/m3	6.3	
GRPCE-01-IA- (Main)	trans-1,2-Dichloroethene	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-01-IA- (Main)	Trichloroethene (TCE)	0.81		0.15	0.17	ug/m3	0.81	
GRPCE-01-IA- (Main)	Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-SS- (Main)	cis-1,2-Dichloroethene	0.22	U	0.2	0.22	ppbV	0.22	U
GRPCE-01-SS- (Main)	Tetrachloroethene	90		0.092	0.13	ppbV	90	
GRPCE-01-SS- (Main)	trans-1,2-Dichloroethene	0.22	U	0.2	0.22	ppbV	0.22	U
GRPCE-01-SS- (Main)	Trichloroethene (TCE)	0.33		0.14	0.16	ppbV	0.33	
GRPCE-01-SS- (Main)	Vinyl Chloride	0.34	U	0.32	0.34	ppbV	0.34	U
GRPCE-01-SS- (Main)	cis-1,2-Dichloroethene	0.87	U	0.8	0.87	ug/m3	0.87	U
GRPCE-01-SS- (Main)	Tetrachloroethene	610		0.62	0.87	ug/m3	610	
GRPCE-01-SS- (Main)	trans-1,2-Dichloroethene	0.87	U	0.79	0.87	ug/m3	0.87	U
GRPCE-01-SS- (Main)	Trichloroethene (TCE)	1.7		0.77	0.87	ug/m3	1.7	
GRPCE-01-SS- (Main)	Vinyl Chloride	0.87	U	0.82	0.87	ug/m3	0.87	U
GRPCE-01-SS- (Main)	cis-1,2-Dichloroethene	0.044	U	0.04	0.044	ppbV	0.044	U
GRPCE-01-SS- (Main)	Tetrachloroethene	10		0.018	0.026	ppbV	10	
GRPCE-01-SS- (Main)	trans-1,2-Dichloroethene	0.044	U	0.04	0.044	ppbV	0.044	U
GRPCE-01-SS- (Main)	Trichloroethene (TCE)	0.032	U	0.029	0.032	ppbV	0.032	U
GRPCE-01-SS- (Main)	Vinyl Chloride	0.068	U	0.065	0.068	ppbV	0.068	U
GRPCE-01-SS- (Main)	cis-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-SS- (Main)	Tetrachloroethene	68		0.13	0.17	ug/m3	68	
GRPCE-01-SS- (Main)	trans-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-01-SS- (Main)	Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604646

Samp_No	Analyte	Result	Lab_Qualifier	MDL	RL	Units	Val_Result	Val_Qualifier
GRPCE-01-SS-████████	Vinyl Chloride	0.17	U	0.17	0.17	ug/m3	0.17	U
GRPCE-01-SS-1232 Euclid	cis-1,2-Dichloroethene	0.59	U	0.55	0.59	ppbV	0.59	U
GRPCE-01-SS-1232 Euclid	Tetrachloroethene	340	D	0.54	0.75	ppbV	340	
GRPCE-01-SS-1232 Euclid	trans-1,2-Dichloroethene	0.59	U	0.54	0.59	ppbV	0.59	U
GRPCE-01-SS-1232 Euclid	Trichloroethene (TCE)	0.72		0.39	0.44	ppbV	0.72	
GRPCE-01-SS-1232 Euclid	Vinyl Chloride	0.92	U	0.88	0.92	ppbV	0.92	U
GRPCE-01-SS-1232 Euclid	cis-1,2-Dichloroethene	2.4	U	2.2	2.4	ug/m3	2.4	U
GRPCE-01-SS-1232 Euclid	Tetrachloroethene	2300	D	3.7	5.1	ug/m3	2300	
GRPCE-01-SS-1232 Euclid	trans-1,2-Dichloroethene	2.4	U	2.1	2.4	ug/m3	2.4	U
GRPCE-01-SS-1232 Euclid	Trichloroethene (TCE)	3.9		2.1	2.4	ug/m3	3.9	
GRPCE-01-SS-1232 Euclid	Vinyl Chloride	2.4	U	2.2	2.4	ug/m3	2.4	U
GRPCE-01-SS-████████	cis-1,2-Dichloroethene	1.2	U	1.1	1.2	ppbV	1.2	U
GRPCE-01-SS-████████	Tetrachloroethene	720		0.53	0.73	ppbV	720	
GRPCE-01-SS-████████	trans-1,2-Dichloroethene	1.2	U	1.1	1.2	ppbV	1.2	U
GRPCE-01-SS-████████	Trichloroethene (TCE)	1.1		0.82	0.92	ppbV	1.1	
GRPCE-01-SS-████████	Vinyl Chloride	1.9	U	1.8	1.9	ppbV	1.9	U
GRPCE-01-SS-████████	cis-1,2-Dichloroethene	4.9	U	4.5	4.9	ug/m3	4.9	U
GRPCE-01-SS-████████	Tetrachloroethene	4800		3.6	4.9	ug/m3	4800	
GRPCE-01-SS-████████	trans-1,2-Dichloroethene	4.9	U	4.5	4.9	ug/m3	4.9	U
GRPCE-01-SS-████████	Trichloroethene (TCE)	5.7		4.4	4.9	ug/m3	5.7	
GRPCE-01-SS-████████	Vinyl Chloride	4.9	U	4.7	4.9	ug/m3	4.9	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1121B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 10, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 10 October 2016
Laboratory Report No.	16100012		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		
Laboratory	Bureau Veritas/Novi, MI		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	Tetrachloroethene and trichloroethene were detected in the method blank below the associated reporting limits (RLs). Therefore, the trichloroethene results below the RLs for all samples were raised to the RL and qualified as non-detect (U). Additionally, the tetrachloroethene results for GRPCE-31-IA- [REDACTED] (MAIN) and GRPCE-35-OA- [REDACTED] were less than ten times the associated blank value and were therefore qualified as estimated with a possible high bias (J+). No further qualifications were required because the associated results were greater than ten times the associated blank value.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-31-IA (REDACTED) BASEMENT)

Date Sampled: 10/2/2016

Lab Number: 006A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.02 psig

Final Pressure: -2.02 psig

Canister ID: 14612

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.17	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	28	0.019	0.16	7.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.10	0.021	0.21	0.030	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/10/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-31-IA- [REDACTED] (MAIN)

Date Sampled: 10/2/2016

Lab Number: 005A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.16 psig

Final Pressure: -2.16 psig

Canister ID: 14398

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.61 J+	0.036	0.27	0.090 J+	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.59	0.019	0.16	0.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/10/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-31-IA- [REDACTED]

Date Sampled: 10/2/2016

Lab Number: 004A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.45 psig

Final Pressure: -2.45 psig

Canister ID: 14128

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	/
127-18-4	Tetrachloroethene	22	0.036	0.27	0.32	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	26	0.019	0.16	6.7	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/10/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-31-IA (MAIN)

Date Sampled: 10/2/2016

Lab Number: 003A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.45 psig

Final Pressure: -2.45 psig

Canister ID: 13966

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.6	0.036	0.27	0.23	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	16	0.019	0.16	4.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21 u	0.010	0.0039	0.04 u	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

gaw
10/10/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-32-IA (redacted) 1)

Date Sampled: 10/2/2016

Lab Number: 001A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.95 psig

Final Pressure: -2.95 psig

Canister ID: 13933

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.83	0.019	0.16	0.21	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/10/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16100012

Sample Identification **GRPCE-32-IA [REDACTED] 2)**

Date Sampled: 10/2/2016

Lab Number: 002A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.94 psig

Final Pressure: -2.94 psig

Canister ID: 14571

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 u	ND	0.0061	0.04 u	1	
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.0	0.019	0.16	1.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21 u	0.010	0.0039	0.04 u	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

gaw
10/10/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery; outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 04-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100012

Sample Identification GRPCE-35-OA- [REDACTED]

Date Sampled: 10/2/2016

Lab Number: 007A

Date Received: 10/3/2016

Sample Type: Air, Can

Analysis Date: 10/3/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.88 psig

Final Pressure: -0.88 psig

Canister ID: 14462

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.27 J	0.036	0.27	0.040 J	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.054	0.021	0.21 U	0.010	0.0039	0.04 U	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/10/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



October 17, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1138**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for fourteen air samples collected at the Grand Rapids VI ER site. The samples were collected October 5 through 7, 2016 and were analyzed for volatile organic compounds by ALS Environmental Laboratories and Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on October 14, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for these data sets. The data is usable as reported by the laboratories.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
ALS ENVIRONMENTAL SDG P1604714
EUROFINS-AIR TOXICS SDGS 1610063 AND 1610154**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1138A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 17 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 14, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1604714	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.51x: VOCs for GRPCE-05-IA- [REDACTED] (Basement) 1.60x: VOCs for GRPCE-05-IA- [REDACTED] (Main) 1.56x: VOCs for GRPCE-05-IA- [REDACTED] (Basement) 1.73x: VOCs for GRPCE-05-IA- [REDACTED] (Main) 1.57x: VOCs for GRPCE-06-IA- [REDACTED] 1.58x: VOCs for GRPCE-05-IA- [REDACTED] (Basement) 8.35x: VOCs for GRPCE-05-IA- [REDACTED] (Main)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604714

Samp_No		Analyte	Result	Lab_Qualifier	MDL	RL	Result_Units	Val_Result	Val_Qualifier
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.039	U	0.036	0.039	ppbV	0.039	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	0.29		0.017	0.023	ppbV	0.29	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.039	U	0.036	0.039	ppbV	0.039	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.029	U	0.026	0.029	ppbV	0.029	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.061	U	0.058	0.061	ppbV	0.061	U
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	1.9		0.11	0.16	ug/m3	1.9	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.044	U	0.04	0.044	ppbV	0.044	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.14		0.018	0.026	ppbV	0.14	
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.044	U	0.04	0.044	ppbV	0.044	U
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.032	U	0.029	0.032	ppbV	0.032	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.068	U	0.064	0.068	ppbV	0.068	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.98		0.12	0.17	ug/m3	0.98	
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.17	U	0.15	0.17	ug/m3	0.17	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.17	U	0.16	0.17	ug/m3	0.17	U
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.04	U	0.037	0.04	ppbV	0.04	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	0.30		0.017	0.023	ppbV	0.30	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.04	U	0.036	0.04	ppbV	0.04	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.029	U	0.026	0.029	ppbV	0.029	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.062	U	0.059	0.062	ppbV	0.062	U
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	2.0		0.11	0.16	ug/m3	2.0	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.04	U	0.037	0.04	ppbV	0.04	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.099		0.017	0.024	ppbV	0.099	
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.04	U	0.037	0.04	ppbV	0.04	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604714

Samp_No		Analyte	Result	Lab_Qualifier	MDL	RL	Result_Units	Val_Result	Val_Qualifier
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.03	U	0.027	0.03	ppbV	0.03	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.063	U	0.059	0.063	ppbV	0.063	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.67		0.12	0.16	ug/m3	0.67	
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	0.035	0.038	ppbV	0.038	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	0.11		0.016	0.022	ppbV	0.11	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	0.035	0.038	ppbV	0.038	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	0.025	0.028	ppbV	0.028	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.059	U	0.056	0.059	ppbV	0.059	U
GRPCE-05-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	0.14	0.15	ug/m3	0.15	U
GRPCE-05-IA-	(Basement)	Tetrachloroethene	0.74		0.11	0.15	ug/m3	0.74	
GRPCE-05-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	0.14	0.15	ug/m3	0.15	U
GRPCE-05-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	0.13	0.15	ug/m3	0.15	U
GRPCE-05-IA-	(Basement)	Vinyl Chloride	0.15	U	0.14	0.15	ug/m3	0.15	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.21	U	0.19	0.21	ppbV	0.21	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.12	U	0.089	0.12	ppbV	0.12	U
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.21	U	0.19	0.21	ppbV	0.21	U
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.16	U	0.14	0.16	ppbV	0.16	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.33	U	0.31	0.33	ppbV	0.33	U
GRPCE-05-IA-	(Main)	cis-1,2-Dichloroethene	0.84	U	0.77	0.84	ug/m3	0.84	U
GRPCE-05-IA-	(Main)	Tetrachloroethene	0.84	U	0.6	0.84	ug/m3	0.84	U
GRPCE-05-IA-	(Main)	trans-1,2-Dichloroethene	0.84	U	0.76	0.84	ug/m3	0.84	U
GRPCE-05-IA-	(Main)	Trichloroethene (TCE)	0.84	U	0.74	0.84	ug/m3	0.84	U
GRPCE-05-IA-	(Main)	Vinyl Chloride	0.84	U	0.79	0.84	ug/m3	0.84	U
GRPCE-06-IA-		cis-1,2-Dichloroethene	0.04	U	0.036	0.04	ppbV	0.04	U
GRPCE-06-IA-		Tetrachloroethene	0.078		0.017	0.023	ppbV	0.078	
GRPCE-06-IA-		trans-1,2-Dichloroethene	0.04	U	0.036	0.04	ppbV	0.04	U
GRPCE-06-IA-		Trichloroethene (TCE)	0.029	U	0.026	0.029	ppbV	0.029	U
GRPCE-06-IA-		Vinyl Chloride	0.061	U	0.058	0.061	ppbV	0.061	U
GRPCE-06-IA-		cis-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604714

Samp_No	Analyte	Result	Lab_Qualifier	MDL	RL	Result_Units	Val_Result	Val_Qualifier
GRPCE-06-IA-[REDACTED]	Tetrachloroethene	0.53		0.11	0.16	ug/m3	0.53	
GRPCE-06-IA-[REDACTED]	trans-1,2-Dichloroethene	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-06-IA-[REDACTED]	Trichloroethene (TCE)	0.16	U	0.14	0.16	ug/m3	0.16	U
GRPCE-06-IA-[REDACTED]	Vinyl Chloride	0.16	U	0.15	0.16	ug/m3	0.16	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1138B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 17 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 14, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1610063	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Two air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.66x: GRPCE-05-IA- [REDACTED] (Basement) 1.67x: GRPCE-05-IA- [REDACTED] (Main)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit were qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1610063

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-05-IA-██████████ (Main)	Vinyl Chloride	ND		0.037	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		0.050	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		0.048	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Main)	Trichloroethene	ND		0.050	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Main)	Tetrachloroethene	0.10	J	0.046	0.17	PPBV	0.10	J
GRPCE-05-IA-██████████ (Main)	Vinyl Chloride	ND		0.095	0.43	UG/M3	0.43	U
GRPCE-05-IA-██████████ (Main)	trans-1,2-Dichloroethene	ND		0.20	0.66	UG/M3	0.66	U
GRPCE-05-IA-██████████ (Main)	cis-1,2-Dichloroethene	ND		0.19	0.66	UG/M3	0.66	U
GRPCE-05-IA-██████████ (Main)	Trichloroethene	ND		0.27	0.90	UG/M3	0.90	U
GRPCE-05-IA-██████████ (Main)	Tetrachloroethene	0.71	J	0.31	1.1	UG/M3	0.71	J
GRPCE-05-IA-██████████ (Basement)	Vinyl Chloride	ND		0.037	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Basement)	trans-1,2-Dichloroethene	ND		0.049	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Basement)	cis-1,2-Dichloroethene	ND		0.048	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Basement)	Trichloroethene	ND		0.049	0.17	PPBV	0.17	U
GRPCE-05-IA-██████████ (Basement)	Tetrachloroethene	0.37		0.045	0.17	PPBV	0.37	
GRPCE-05-IA-██████████ (Basement)	Vinyl Chloride	ND		0.094	0.42	UG/M3	0.42	U
GRPCE-05-IA-██████████ (Basement)	trans-1,2-Dichloroethene	ND		0.20	0.66	UG/M3	0.66	U
GRPCE-05-IA-██████████ (Basement)	cis-1,2-Dichloroethene	ND		0.19	0.66	UG/M3	0.66	U
GRPCE-05-IA-██████████ (Basement)	Trichloroethene	ND		0.26	0.89	UG/M3	0.89	U
GRPCE-05-IA-██████████ (Basement)	Tetrachloroethene	2.5		0.31	1.1	UG/M3	2.5	

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1138C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 17 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 14, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1610154	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Five air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.46x: GRPCE-01-[REDACTED] B 1.49x: GRPCE-01-[REDACTED] A1 1.61x: GRPCE-05-IA-[REDACTED] Common)
	1.97x: GRPCE-05-IA-[REDACTED] SFR) 6.07x: GRPCE-01-[REDACTED] A2

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit were qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1610154

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-01-██████████	A1 Vinyl Chloride		ND	0.039	0.15	PPBV	0.15	U
GRPCE-01-██████████	A1 trans-1,2-Dichloroethene		ND	0.035	0.15	PPBV	0.15	U
GRPCE-01-██████████	A1 cis-1,2-Dichloroethene		ND	0.049	0.15	PPBV	0.15	U
GRPCE-01-██████████	A1 Trichloroethene	0.27		0.050	0.15	PPBV	0.27	
GRPCE-01-██████████	A1 Tetrachloroethene	33		0.024	0.15	PPBV	33	
GRPCE-01-██████████	A1 Vinyl Chloride		ND	0.10	0.38	UG/M3	0.38	U
GRPCE-01-██████████	A1 trans-1,2-Dichloroethene		ND	0.14	0.59	UG/M3	0.59	U
GRPCE-01-██████████	A1 cis-1,2-Dichloroethene		ND	0.19	0.59	UG/M3	0.59	U
GRPCE-01-██████████	A1 Trichloroethene	1.4		0.27	0.80	UG/M3	1.4	
GRPCE-01-██████████	A1 Tetrachloroethene	220		0.16	1.0	UG/M3	220	
GRPCE-01-██████████	A2 Vinyl Chloride		ND	0.32	3.0	PPBV	3.0	U
GRPCE-01-██████████	A2 cis-1,2-Dichloroethene	4.1		0.85	3.0	PPBV	4.1	
GRPCE-01-██████████	A2 Trichloroethene	12		0.27	3.0	PPBV	12	
GRPCE-01-██████████	A2 Tetrachloroethene	1200		0.35	3.0	PPBV	1200	
GRPCE-01-██████████	A2 trans-1,2-Dichloroethene		ND	0.90	3.0	PPBV	3.0	U
GRPCE-01-██████████	A2 Vinyl Chloride		ND	0.81	7.8	UG/M3	7.8	U
GRPCE-01-██████████	A2 cis-1,2-Dichloroethene	16		3.4	12	UG/M3	16	
GRPCE-01-██████████	A2 Trichloroethene	68		1.4	16	UG/M3	68	
GRPCE-01-██████████	A2 Tetrachloroethene	8000		2.4	20	UG/M3	8000	
GRPCE-01-██████████	A2 trans-1,2-Dichloroethene		ND	3.6	12	UG/M3	12	U
GRPCE-01-██████████	B Vinyl Chloride		ND	0.038	0.15	PPBV	0.15	U
GRPCE-01-██████████	B trans-1,2-Dichloroethene		ND	0.034	0.15	PPBV	0.15	U
GRPCE-01-██████████	B cis-1,2-Dichloroethene		ND	0.048	0.15	PPBV	0.15	U
GRPCE-01-██████████	B Trichloroethene	0.14	J	0.049	0.15	PPBV	0.14	J
GRPCE-01-██████████	B Tetrachloroethene	15		0.023	0.15	PPBV	15	
GRPCE-01-██████████	B Vinyl Chloride		ND	0.098	0.37	UG/M3	0.37	U
GRPCE-01-██████████	B trans-1,2-Dichloroethene		ND	0.13	0.58	UG/M3	0.58	U
GRPCE-01-██████████	B cis-1,2-Dichloroethene		ND	0.19	0.58	UG/M3	0.58	U
GRPCE-01-██████████	B Trichloroethene	0.76	J	0.26	0.78	UG/M3	0.76	J
GRPCE-01-██████████	B Tetrachloroethene	100		0.16	0.99	UG/M3	100	
GRPCE-05-IA-██████████	Common) Vinyl Chloride		ND	0.042	0.16	PPBV	0.16	U
GRPCE-05-IA-██████████	Common) trans-1,2-Dichloroethene		ND	0.037	0.16	PPBV	0.16	U
GRPCE-05-IA-██████████	Common) cis-1,2-Dichloroethene		ND	0.052	0.16	PPBV	0.16	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1610154

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-05-IA-[REDACTED]	Common) Trichloroethene		ND	0.054	0.16	PPBV	0.16	U
GRPCE-05-IA-[REDACTED]	Common) Tetrachloroethene	0.11	J	0.026	0.16	PPBV	0.11	J
GRPCE-05-IA-[REDACTED]	Common) Vinyl Chloride		ND	0.11	0.41	UG/M3	0.41	U
GRPCE-05-IA-[REDACTED]	Common) trans-1,2-Dichloroethene		ND	0.15	0.64	UG/M3	0.64	U
GRPCE-05-IA-[REDACTED]	Common) cis-1,2-Dichloroethene		ND	0.21	0.64	UG/M3	0.64	U
GRPCE-05-IA-[REDACTED]	Common) Trichloroethene		ND	0.29	0.86	UG/M3	0.86	U
GRPCE-05-IA-[REDACTED]	Common) Tetrachloroethene	0.75	J	0.17	1.1	UG/M3	0.75	J
GRPCE-05-IA-[REDACTED]	SFR) Vinyl Chloride		ND	0.052	0.20	PPBV	0.20	U
GRPCE-05-IA-[REDACTED]	SFR) trans-1,2-Dichloroethene		ND	0.046	0.20	PPBV	0.20	U
GRPCE-05-IA-[REDACTED]	SFR) cis-1,2-Dichloroethene		ND	0.064	0.20	PPBV	0.20	U
GRPCE-05-IA-[REDACTED]	SFR) Trichloroethene		ND	0.066	0.20	PPBV	0.20	U
GRPCE-05-IA-[REDACTED]	SFR) Tetrachloroethene	0.13	J	0.031	0.20	PPBV	0.13	J
GRPCE-05-IA-[REDACTED]	SFR) Vinyl Chloride		ND	0.13	0.50	UG/M3	0.50	U
GRPCE-05-IA-[REDACTED]	SFR) trans-1,2-Dichloroethene		ND	0.18	0.78	UG/M3	0.78	U
GRPCE-05-IA-[REDACTED]	SFR) cis-1,2-Dichloroethene		ND	0.25	0.78	UG/M3	0.78	U
GRPCE-05-IA-[REDACTED]	SFR) Trichloroethene		ND	0.36	1.0	UG/M3	1.0	U
GRPCE-05-IA-[REDACTED]	SFR) Tetrachloroethene	0.91	J	0.21	1.3	UG/M3	0.91	J



October 20, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1147**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for five air samples collected at the Grand Rapids VI ER site. The samples were collected on October 7, 2016 and were analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the data on October 18, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
ALS SDG P1604757**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1147	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 20 October 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> October 19, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1604757	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Five air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.51x: VOCs for GRPCE-04-IA-[REDACTED] - W) 1.62x: VOCs for GRPCE-05-IA-[REDACTED] - S) 1.59x: VOCs for GRPCE-05-IA-[REDACTED] - N) 1.68x: VOCs for GRPCE-05-IA-[REDACTED] - W) 1.60x: VOCs for GRPCE-05-IA-[REDACTED] - N)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604757

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-04-IA-	- W) cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-04-IA-	- W) Tetrachloroethene	0.13		ppbV	0.016	0.022	0.13	
GRPCE-04-IA-	- W) trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-04-IA-	- W) Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-04-IA-	- W) Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-04-IA-	- W) cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-04-IA-	- W) Tetrachloroethene	0.88		ug/m3	0.11	0.15	0.88	
GRPCE-04-IA-	- W) trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-04-IA-	- W) Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-04-IA-	- W) Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-05-IA-	- N) cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-05-IA-	- N) Tetrachloroethene	0.086		ppbV	0.017	0.024	0.086	
GRPCE-05-IA-	- N) trans-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-05-IA-	- N) Trichloroethene (TCE)	0.03	U	ppbV	0.027	0.03	0.03	U
GRPCE-05-IA-	- N) Vinyl Chloride	0.063	U	ppbV	0.059	0.063	0.063	U
GRPCE-05-IA-	- N) cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-	- N) Tetrachloroethene	0.58		ug/m3	0.12	0.16	0.58	
GRPCE-05-IA-	- N) trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-	- N) Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-05-IA-	- N) Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-	- N) cis-1,2-Dichloroethene	0.17		ppbV	0.037	0.04	0.17	
GRPCE-05-IA-	- N) Tetrachloroethene	0.33		ppbV	0.017	0.023	0.33	
GRPCE-05-IA-	- N) trans-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-05-IA-	- N) Trichloroethene (TCE)	0.03	U	ppbV	0.026	0.03	0.03	U
GRPCE-05-IA-	- N) Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-05-IA-	- N) cis-1,2-Dichloroethene	0.68		ug/m3	0.15	0.16	0.68	
GRPCE-05-IA-	- N) Tetrachloroethene	2.2		ug/m3	0.11	0.16	2.2	
GRPCE-05-IA-	- N) trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-05-IA-	- N) Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-05-IA-	- N) Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-	- S) cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-05-IA-	- S) Tetrachloroethene	0.28		ppbV	0.017	0.024	0.28	
GRPCE-05-IA-	- S) trans-1,2-Dichloroethene	0.041	U	ppbV	0.037	0.041	0.041	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1604757

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-05-IA-		- S) Trichloroethene (TCE)	0.03	U	ppbV	0.027	0.03	0.03	U
GRPCE-05-IA-		- S) Vinyl Chloride	0.063	U	ppbV	0.06	0.063	0.063	U
GRPCE-05-IA-		- S) cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-		- S) Tetrachloroethene	1.9		ug/m3	0.12	0.16	1.9	
GRPCE-05-IA-		- S) trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-		- S) Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-05-IA-		- S) Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-05-IA-		- W) cis-1,2-Dichloroethene	0.042	U	ppbV	0.039	0.042	0.042	U
GRPCE-05-IA-		- W) Tetrachloroethene	0.23		ppbV	0.018	0.025	0.23	
GRPCE-05-IA-		- W) trans-1,2-Dichloroethene	0.042	U	ppbV	0.039	0.042	0.042	U
GRPCE-05-IA-		- W) Trichloroethene (TCE)	0.031	U	ppbV	0.028	0.031	0.031	U
GRPCE-05-IA-		- W) Vinyl Chloride	0.066	U	ppbV	0.062	0.066	0.066	U
GRPCE-05-IA-		- W) cis-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-05-IA-		- W) Tetrachloroethene	1.5		ug/m3	0.12	0.17	1.5	
GRPCE-05-IA-		- W) trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-05-IA-		- W) Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-05-IA-		- W) Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U



October 25, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1154**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 16 air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on October 7 and 11, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on October 21, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for these data sets. The data is usable as reported by the laboratory.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist



Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16100457 AND 16100673**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1154A	QC Reviewer (signature and date)	 October 25, 2016
Data Reviewer (signature and date)	 October 24, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16100457	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-32-1A (REDACTED) BASEMENT)

Date Sampled: 10/7/2016

Lab Number: 006A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.79 psig

Final Pressure: -1.79 psig

Canister ID: 14534

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.0	0.019	0.16	1.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/24/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-32-IA [REDACTED] (MAIN)

Date Sampled: 10/7/2016

Lab Number: 005A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.75 psig

Final Pressure: -1.75 psig

Canister ID: 14574

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		1
127-18-4	Tetrachloroethene	1.7	0.036	0.27	0.25	0.0053	0.04		1
156-60-5	trans-1,2-Dichloroethene	6.5	0.019	0.16	1.6	0.0049	0.04		1
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04		1
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		1

gaw
10/24/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-32-IA [REDACTED]

Date Sampled: 10/7/2016

Lab Number: 004A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.94 psig

Final Pressure: -1.94 psig

Canister ID: 14617

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 u	ND	0.0061	0.04 u		
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04		1
156-60-5	trans-1,2-Dichloroethene	6.5	0.019	0.16	1.7	0.0049	0.04		1
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04		1
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u		1

gaw
10/24/16

General Notes and Qualifiers:

-, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-32-IA [REDACTED]

Date Sampled: 10/7/2016

Lab Number: 003A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.1 psig

Final Pressure: -2.1 psig

Canister ID: 142111

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.44	0.019	0.16	0.11	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/24/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-33-IA ()

Date Sampled: 10/7/2016

Lab Number: 001A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.47 psig

Final Pressure: -2.47 psig

Canister ID: 13997

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079 J	0.019	0.16	0.020 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/24/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-33-IA [REDACTED] 2)

Date Sampled: 10/7/2016

Lab Number: 002A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.86 psig

Final Pressure: -1.86 psig

Canister ID: 13999

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.16	0.019	0.16	0.040	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

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General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 13-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100457

Sample Identification GRPCE-36-OA-XXXXXXXXXX

Date Sampled: 10/7/2016

Lab Number: 007A

Date Received: 10/7/2016

Sample Type: Air, Can

Analysis Date: 10/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.81 psig

Final Pressure: -1.81 psig

Canister ID: 14068

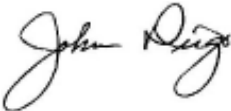

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1154B	QC Reviewer (signature and date)	 October 25, 2016
Data Reviewer (signature and date)	 October 24, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16100673	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Nine air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-33-IA-[REDACTED] (BASEMENT)/GRPCE-33-IA-[REDACTED] (BASEMENT)-DP and GRPCE-33-IA-[REDACTED] GRPCE-33-IA-[REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-IA [REDACTED] BASEMENT)

Date Sampled: 10/11/2016

Lab Number: 007A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.82 psig

Final Pressure: -1.82 psig

Canister ID: 14025

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.8	0.019	0.16	1.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-IA [REDACTED] BASEMENT)-DP

Date Sampled: 10/11/2016

Lab Number: 008A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.3 psig

Final Pressure: -1.3 psig

Canister ID: 14148

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.8	0.019	0.16	1.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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10/24/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-LA [REDACTED] (MAIN)

Date Sampled: 10/11/2016

Lab Number: 006A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.44 psig

Final Pressure: -1.44 psig

Canister ID: 14315

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16u	ND	0.0061	0.04u	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.7	0.019	0.16	1.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11J	0.021	0.21	0.020J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10u	ND	0.0088	0.04u	1	

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10/24/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-IA-1 (BASEMENT)

Date Sampled: 10/11/2016

Lab Number: 004A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.0 psig

Final Pressure: -2.0 psig

Canister ID: 14548

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.2	0.019	0.16	1.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/24/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH
Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-IA- [REDACTED] DP
Lab Number: 005A
Sample Type: Air, Can
Test Method: EPA Method TO-15A
Initial Pressure: -1.93 psig
Final Pressure: -1.93 psig
Canister ID: 14122

Date Sampled: 10/11/2016
Date Received: 10/12/2016
Analysis Date: 10/13/2016
Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.3	0.019	0.16	1.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/24/16

General Notes and Qualifiers:

—; Information not available or not applicable.
ND; Less than the indicated limit of detection (LOD)
RL; Report Limit
J; Value is between the MDL and Reporting Limit, estimated r
MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
S; Spike Recovery outside accepted recovery limits
R; RPD outside accepted recovery limits
T; Tentatively Identified Compound (TIC)
E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-33-IA- [REDACTED]

Date Sampled: 10/11/2016

Lab Number: 003A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.25 psig

Final Pressure: -2.25 psig

Canister ID: 14290

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 u	ND	0.0061	0.04 u	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.9	0.019	0.16	0.48	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 u	ND	0.0088	0.04 u	1	

gaw
10/24/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-34-IA-██████ 1)

Date Sampled: 10/11/2016

Lab Number: 001A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.72 psig

Final Pressure: -1.72 psig

Canister ID: 14626

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
10/24/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-34-IA-XXXXXXXXXX 2)

Date Sampled: 10/11/2016

Lab Number: 002A

Date Received: 10/12/2016

Sample Type: Air, Can

Analysis Date: 10/13/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.01 psig

Final Pressure: -1.01 psig

Canister ID: 14120

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.36	0.019	0.16	0.090	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/24/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 18-Oct-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16100673

Sample Identification GRPCE-37-OA
 Lab Number: 009A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -1.38 psig
 Final Pressure: -1.38 psig
 Canister ID: 14132

Date Sampled: 10/11/2016
 Date Received: 10/12/2016
 Analysis Date: 10/13/2016
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.164	ND	0.0049	0.044	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
10/24/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



November 3, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1190**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 16 air samples (including two field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on October 19 and 25, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on October 28, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for these data sets. The data is usable as reported by the laboratory.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist



Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16101178 AND 16101538**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1190A	QC Reviewer (signature and date)	 November 3, 2016
Data Reviewer (signature and date)	 November 3, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16101178	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-34-IA- [REDACTED] (MAIN)/GRPCE-34-IA- [REDACTED] (MAIN)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-34-IA [REDACTED] BASEMENT)

Date Sampled: 10/19/2016

Lab Number: 007A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.28 psig

Final Pressure: -1.28 psig

Canister ID: 14474

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.7	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-34-IA [REDACTED] (MAIN)

Date Sampled: 10/19/2016

Lab Number: 005A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.55 psig

Final Pressure: -1.55 psig

Canister ID: 14020

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.0	0.019	0.16	1.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-34-IA [REDACTED] MAIN)-DP

Date Sampled: 10/19/2016

Lab Number: 006A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.85 psig

Final Pressure: -1.85 psig

Canister ID: 14180

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.1	0.036	0.27	0.16	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.3	0.019	0.16	1.8	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

gaw
11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-34-IA-1168(BASEMENT)

Date Sampled: 10/19/2016

Lab Number: 004A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.56 psig

Final Pressure: -1.56 psig

Canister ID: 14179

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04		
156-60-5	trans-1,2-Dichloroethene	5.1	0.019	0.16	1.3	0.0049	0.04		
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04		Y
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

gaw
11/03/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-34-XXXXXXXXXX)

Date Sampled: 10/19/2016

Lab Number: 003A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.93 psig

Final Pressure: -1.93 psig

Canister ID: 14031

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.59	0.019	0.16	0.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-35-IA-XXXXXXXXXX 1)

Date Sampled: 10/19/2016

Lab Number: 001A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.47 psig

Final Pressure: -2.47 psig

Canister ID: 14007

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	J
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079 J	0.019	0.16	0.020 J	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-35-IA [REDACTED] 2)

Date Sampled: 10/19/2016

Lab Number: 002A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.44 psig

Final Pressure: -1.44 psig

Canister ID: 14471

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.48	0.019	0.16	0.12	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101178

Sample Identification GRPCE-38-OA-XXXXXXXXXX

Date Sampled: 10/19/2016

Lab Number: 008A

Date Received: 10/19/2016

Sample Type: Air, Can

Analysis Date: 10/20/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.1 psig

Final Pressure: -1.1 psig

Canister ID: 14584

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	U	ND	0.0061	0.04	U
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04		
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	U	ND	0.0049	0.04	U
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04		
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	ND	0.0088	0.04	U



gaw
11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1190B	QC Reviewer (signature and date)	 November 3, 2016
Data Reviewer (signature and date)	 November 3, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16101538	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-36-IA-██████1)/GRPCE-36-IA-██████1)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 27-Oct-16

Client: **TETRA TECH**
 Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16101538

Sample Identification: GRPCE-35-IA (██████████ BASEMENT)

Date Sampled: 10/25/2016

Lab Number: 007A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.71 psig

Final Pressure: -1.71 psig

Canister ID: 13934

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.6	0.019	0.16	0.90	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-35-IA-██████████(MAIN)

Date Sampled: 10/25/2016

Lab Number: 006A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.39 psig

Final Pressure: -0.39 psig

Canister ID: 13931

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	S
156-60-5	trans-1,2-Dichloroethene	0.52	0.019	0.16	0.13	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	r
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-35-IA- [REDACTED]

Date Sampled: 10/25/2016

Lab Number: 005A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.83 psig

Final Pressure: -1.83 psig

Canister ID: 14546

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.0	0.019	0.16	0.75	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-35-IA- [REDACTED]

Date Sampled: 10/25/2016

Lab Number: 004A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.03 psig

Final Pressure: -2.03 psig

Canister ID: 14576

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04		
156-60-5	trans-1,2-Dichloroethene	2.9	0.019	0.16	0.74	0.0049	0.04		
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04		
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-36-IA-XXXXXXXXXX 1)

Date Sampled: 10/25/2016

Lab Number: 001A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.49 psig

Final Pressure: -2.49 psig

Canister ID: 14069

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.32	0.019	0.16	0.080	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-36-IA-██████1)-DP

Date Sampled: 10/25/2016

Lab Number: 002A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.89 psig

Final Pressure: -1.89 psig

Canister ID: 14399

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.32	0.019	0.16	0.080	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	y
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-36-IA-[REDACTED] 2)

Date Sampled: 10/25/2016

Lab Number: 003A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.19 psig

Final Pressure: -2.19 psig

Canister ID: 14028

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.3	0.019	0.16	0.32	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	Y
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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11/03/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 27-Oct-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16101538

Sample Identification GRPCE-39-OA [REDACTED]

Date Sampled: 10/25/2016

Lab Number: 008A

Date Received: 10/25/2016

Sample Type: Air, Can

Analysis Date: 10/26/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.34 psig

Final Pressure: -0.34 psig

Canister ID: 14143

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 <u>u</u>	ND	0.0061	0.04 <u>u</u>		
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04		
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16 <u>u</u>	ND	0.0049	0.04 <u>u</u>		
79-01-6	Trichloroethene	0.054 <u>J</u>	0.021	0.21	0.010 <u>J</u>	0.0039	0.04		1
75-01-4	Vinyl Chloride	ND	0.022	0.10 <u>u</u>	ND	0.0088	0.04 <u>u</u>		

gaw
11/03/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



November 14, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1249**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 15 air samples (including one field duplicate) collected at the Grand Rapids VI ER site. The samples were collected on November 3 and 8, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on November 11, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16110327 AND 16110548**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1249A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 14 November 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> November 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16110327	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Seven air samples	Field Duplicate Pairs	None
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification: GRPCE-36-1A ([REDACTED] BASEMENT)

Date Sampled: 11/3/2016

Lab Number: 006A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.72 psig

Final Pressure: -1.72 psig

Canister ID: 14052

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16U	ND	0.0061	0.04U	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.8	0.019	0.16	1.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.70	0.021	0.21	0.13	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10U	ND	0.0088	0.04U	1	

gaw
11/14/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16110327

Sample Identification **GRPCE-36-IA [REDACTED] (MAIN)**

Date Sampled: 11/3/2016

Lab Number: 005A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.63 psig

Final Pressure: -1.63 psig

Canister ID: 14048

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	1.0	0.036	0.27	0.15	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.5	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.54	0.021	0.21	0.10	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification GRPCE-36-IA- [REDACTED]

Date Sampled: 11/3/2016

Lab Number: 004A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.73 psig

Final Pressure: -1.73 psig

Canister ID: 14049

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.2	0.019	0.16	1.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.91	0.021	0.21	0.17	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
11/14/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification GRPCE-36-IA- [REDACTED]

Date Sampled: 11/3/2016

Lab Number: 003A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.94 psig

Final Pressure: -1.94 psig

Canister ID: 13927

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.1	0.019	0.16	0.29	0.0049	0.04	1	
79-01-6	Trichloroethene	4.9	0.021	0.21	0.91	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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11/14/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification GRPCE-37-1A (redacted) 1)

Date Sampled: 11/3/2016

Lab Number: 001A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.0 psig

Final Pressure: -2.0 psig

Canister ID: 14022

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.079 J	0.019	0.16	0.020 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

Handwritten signature and date: 11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification GRPCE-37-IA ()

Date Sampled: 11/3/2016

Lab Number: 002A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.49 psig

Final Pressure: -2.49 psig

Canister ID: 14542

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16U	ND	0.0061	0.04U	1	
127-18-4	Tetrachloroethene	1.5	0.036	0.27	0.22	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.63	0.019	0.16	0.16	0.0049	0.04	1	
79-01-6	Trichloroethene	1.5	0.021	0.21	0.28	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10U	ND	0.0088	0.04U	1	

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General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 08-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110327

Sample Identification GRPCE-40-OA- [REDACTED]

Date Sampled: 11/3/2016

Lab Number: 007A

Date Received: 11/3/2016

Sample Type: Air, Can

Analysis Date: 11/7/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.99 psig

Final Pressure: -0.99 psig

Canister ID: 13945

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16U	ND	0.0061	0.04U	1	
127-18-4	Tetrachloroethene	0.14 J	0.036	0.27	0.020 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16U	ND	0.0049	0.04U	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10U	ND	0.0088	0.04U	1	

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General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1249B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 14 November 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> November 14, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16110548	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-37-IA- [REDACTED] BASEMENT)/GRPCE-37-IA- [REDACTED] BASEMENT)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	The method blank contained trans-1,2-dichloroethene below the reporting limit (RL); therefore, the trans-1,2-dichloroethene results for GRPCE-38-IA-██████1) and GRPCE-41-OA-██████ were raised to the RL and qualified as non-detect (U). No further qualifications were required because the associated results were greater than ten times the blank concentration.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 10-Nov-16

Client: **TETRA TECH**

Project: **GRAND RAPIDS EMERGENCY RESPONSE**

Work Order No: 16110548

Sample Identification **GRPCE-37-IA [REDACTED] BASEMENT**

Date Sampled: 11/8/2016

Lab Number: 006A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.0 psig

Final Pressure: -2.0 psig

Canister ID: 14543

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04		
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04		
156-60-5	trans-1,2-Dichloroethene	4.0	0.019	0.16	1.0	0.0049	0.04		
79-01-6	Trichloroethene	0.27	0.021	0.21	0.050	0.0039	0.04		
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04		

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11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-37-IA [REDACTED] (BASEMENT)-DP

Date Sampled: 11/8/2016

Lab Number: 007A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.47 psig

Final Pressure: -2.47 psig

Canister ID: 14627

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	4.0	0.019	0.16	1.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.27	0.021	0.21	0.050	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-37-IA (REDACTED) (MAIN)

Date Sampled: 11/8/2016

Lab Number: 005A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.9 psig

Final Pressure: -2.9 psig

Canister ID: 13989

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.2	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-37-XXXXXXXXXX)

Date Sampled: 11/8/2016

Lab Number: 004A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.87 psig

Final Pressure: -1.87 psig

Canister ID: 14002

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.4	0.019	0.16	0.87	0.0049	0.04	1	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-37-IA- (redacted)

Date Sampled: 11/8/2016

Lab Number: 003A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.81 psig

Final Pressure: -2.81 psig

Canister ID: 14632

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.3	0.019	0.16	0.34	0.0049	0.04	1	
79-01-6	Trichloroethene	1.1	0.021	0.21	0.20	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-38-IA ()

Date Sampled: 11/8/2016

Lab Number: 001A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.53 psig

Final Pressure: -0.53 psig

Canister ID: 14177

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12	0.019	0.16 U	0.030	0.0049	0.04 U	1	✓
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

DRS
11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-38-IA- [REDACTED]

Date Sampled: 11/8/2016

Lab Number: 002A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.79 psig

Final Pressure: -2.79 psig

Canister ID: 14157

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	13	0.036	0.27	0.19	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.79	0.019	0.16	0.20	0.0049	0.04	1	
79-01-6	Trichloroethene	0.48	0.021	0.21	0.090	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

Jaw
11/14/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 10-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110548

Sample Identification GRPCE-41-OA [REDACTED]

Date Sampled: 11/8/2016

Lab Number: 008A

Date Received: 11/9/2016

Sample Type: Air, Can

Analysis Date: 11/10/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.83 psig

Final Pressure: -0.83 psig

Canister ID: 13940

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.030	0.019	0.16 U	0.010	0.0049	0.04 U	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/14/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



November 18, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1290**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting this Data Validation Report for eight air samples collected at the Grand Rapids VI ER site. The samples were collected on November 8, 2016 and were analyzed for volatile organic compounds by Eurofins-Air Toxics Laboratory. Tetra Tech received the final data on November 14, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

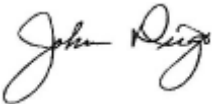

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
EUROFINS-AIR TOXICS SDG 1611159**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1290	QC Reviewer (signature and date)	 November 18, 2016
Data Reviewer (signature and date)	 November 18, 2016	Laboratory	Eurofins-Air Toxics/Folsom, CA
Laboratory Report No.	1611159	Analyses Volatile organic compounds (VOCs) by EPA Method TO-15	
Samples and Matrix	Eight air samples		
Field Duplicate Pairs	GRPCE-06-IA-[REDACTED]W)/GRPCE-06-IA-[REDACTED]W)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
N	The percent relative standard deviations for cis-1,2-dichloroethene and trans-1,2-dichloroethene exceeded the acceptance limit; therefore, the associated non-detect results were qualified as estimated (UJ).

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.54x: GRPCE-06-IA-[REDACTED] S) 1.78x: GRPCE-07-IA-[REDACTED] N) 1.64x: GRPCE-06-IA-[REDACTED] N) 1.81x: GRPCE-06-IA-[REDACTED] Common) 1.65x: GRPCE-06-IA-[REDACTED] W) 1.83x: GRPCE-05-IA-[REDACTED] W) 1.76x: GRPCE-06-IA-[REDACTED] W)-DP 1.84x: GRPCE-06-IA-[REDACTED] SFR)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between the method detection limit and the reporting limit with qualified as estimated (J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1611159

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-06-IA-[REDACTED] N)	Vinyl Chloride	ND		0.043	0.16	PPBV	0.16	U
GRPCE-06-IA-[REDACTED] N)	trans-1,2-Dichloroethene	ND		0.038	0.16	PPBV	0.16	UJ
GRPCE-06-IA-[REDACTED] N)	cis-1,2-Dichloroethene	ND		0.054	0.16	PPBV	0.16	UJ
GRPCE-06-IA-[REDACTED] N)	Trichloroethene	ND		0.055	0.16	PPBV	0.16	U
GRPCE-06-IA-[REDACTED] N)	Tetrachloroethene	0.11	J	0.026	0.16	PPBV	0.11	J
GRPCE-06-IA-[REDACTED] N)	Vinyl Chloride	ND		0.11	0.42	UG/M3	0.42	U
GRPCE-06-IA-[REDACTED] N)	trans-1,2-Dichloroethene	ND		0.15	0.65	UG/M3	0.65	UJ
GRPCE-06-IA-[REDACTED] N)	cis-1,2-Dichloroethene	ND		0.21	0.65	UG/M3	0.65	UJ
GRPCE-06-IA-[REDACTED] N)	Trichloroethene	ND		0.30	0.88	UG/M3	0.88	U
GRPCE-06-IA-[REDACTED] N)	Tetrachloroethene	0.74	J	0.18	1.1	UG/M3	0.74	J
GRPCE-05-IA-[REDACTED] W)	Vinyl Chloride	ND		0.048	0.18	PPBV	0.18	U
GRPCE-05-IA-[REDACTED] W)	trans-1,2-Dichloroethene	ND		0.042	0.18	PPBV	0.18	UJ
GRPCE-05-IA-[REDACTED] W)	cis-1,2-Dichloroethene	ND		0.060	0.18	PPBV	0.18	UJ
GRPCE-05-IA-[REDACTED] W)	Trichloroethene	ND		0.062	0.18	PPBV	0.18	U
GRPCE-05-IA-[REDACTED] W)	Tetrachloroethene	0.17	J	0.029	0.18	PPBV	0.17	J
GRPCE-05-IA-[REDACTED] W)	Vinyl Chloride	ND		0.12	0.47	UG/M3	0.47	U
GRPCE-05-IA-[REDACTED] W)	trans-1,2-Dichloroethene	ND		0.17	0.72	UG/M3	0.72	UJ
GRPCE-05-IA-[REDACTED] W)	cis-1,2-Dichloroethene	ND		0.24	0.72	UG/M3	0.72	UJ
GRPCE-05-IA-[REDACTED] W)	Trichloroethene	ND		0.33	0.98	UG/M3	0.98	U
GRPCE-05-IA-[REDACTED] W)	Tetrachloroethene	1.2	J	0.20	1.2	UG/M3	1.2	J
GRPCE-06-IA-[REDACTED] Common)	Vinyl Chloride	ND		0.047	0.18	PPBV	0.18	U
GRPCE-06-IA-[REDACTED] Common)	trans-1,2-Dichloroethene	ND		0.042	0.18	PPBV	0.18	UJ
GRPCE-06-IA-[REDACTED] Common)	cis-1,2-Dichloroethene	ND		0.059	0.18	PPBV	0.18	UJ
GRPCE-06-IA-[REDACTED] Common)	Trichloroethene	0.20		0.061	0.18	PPBV	0.20	
GRPCE-06-IA-[REDACTED] Common)	Tetrachloroethene	0.51		0.029	0.18	PPBV	0.51	
GRPCE-06-IA-[REDACTED] Common)	Vinyl Chloride	ND		0.12	0.46	UG/M3	0.46	U
GRPCE-06-IA-[REDACTED] Common)	trans-1,2-Dichloroethene	ND		0.17	0.72	UG/M3	0.72	UJ
GRPCE-06-IA-[REDACTED] Common)	cis-1,2-Dichloroethene	ND		0.23	0.72	UG/M3	0.72	UJ
GRPCE-06-IA-[REDACTED] Common)	Trichloroethene	1.0		0.33	0.97	UG/M3	1.0	
GRPCE-06-IA-[REDACTED] Common)	Tetrachloroethene	3.4		0.20	1.2	UG/M3	3.4	
GRPCE-06-IA-[REDACTED] SFR)	Vinyl Chloride	ND		0.048	0.18	PPBV	0.18	U
GRPCE-06-IA-[REDACTED] SFR)	trans-1,2-Dichloroethene	ND		0.043	0.18	PPBV	0.18	UJ
GRPCE-06-IA-[REDACTED] SFR)	cis-1,2-Dichloroethene	ND		0.060	0.18	PPBV	0.18	UJ

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1611159

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-06-IA-██████████ SFR)	Trichloroethene		ND	0.062	0.18	PPBV	0.18	U
GRPCE-06-IA-██████████ SFR)	Tetrachloroethene	0.12	J	0.029	0.18	PPBV	0.12	J
GRPCE-06-IA-██████████ SFR)	Vinyl Chloride		ND	0.12	0.47	UG/M3	0.47	U
GRPCE-06-IA-██████████ SFR)	trans-1,2-Dichloroethene		ND	0.17	0.73	UG/M3	0.73	UJ
GRPCE-06-IA-██████████ SFR)	cis-1,2-Dichloroethene		ND	0.24	0.73	UG/M3	0.73	UJ
GRPCE-06-IA-██████████ SFR)	Trichloroethene		ND	0.33	0.99	UG/M3	0.99	U
GRPCE-06-IA-██████████ SFR)	Tetrachloroethene	0.80	J	0.20	1.2	UG/M3	0.80	J
GRPCE-07-IA-██████████ N)	Vinyl Chloride		ND	0.047	0.18	PPBV	0.18	U
GRPCE-07-IA-██████████ N)	trans-1,2-Dichloroethene		ND	0.041	0.18	PPBV	0.18	UJ
GRPCE-07-IA-██████████ N)	cis-1,2-Dichloroethene		ND	0.058	0.18	PPBV	0.18	UJ
GRPCE-07-IA-██████████ N)	Trichloroethene		ND	0.060	0.18	PPBV	0.18	U
GRPCE-07-IA-██████████ N)	Tetrachloroethene	0.26		0.028	0.18	PPBV	0.26	
GRPCE-07-IA-██████████ N)	Vinyl Chloride		ND	0.12	0.46	UG/M3	0.46	U
GRPCE-07-IA-██████████ N)	trans-1,2-Dichloroethene		ND	0.16	0.70	UG/M3	0.70	UJ
GRPCE-07-IA-██████████ N)	cis-1,2-Dichloroethene		ND	0.23	0.70	UG/M3	0.70	UJ
GRPCE-07-IA-██████████ N)	Trichloroethene		ND	0.32	0.96	UG/M3	0.96	U
GRPCE-07-IA-██████████ N)	Tetrachloroethene	1.7		0.19	1.2	UG/M3	1.7	
GRPCE-06-IA-██████████ S)	Vinyl Chloride		ND	0.040	0.15	PPBV	0.15	U
GRPCE-06-IA-██████████ S)	trans-1,2-Dichloroethene		ND	0.036	0.15	PPBV	0.15	UJ
GRPCE-06-IA-██████████ S)	cis-1,2-Dichloroethene		ND	0.050	0.15	PPBV	0.15	UJ
GRPCE-06-IA-██████████ S)	Trichloroethene		ND	0.052	0.15	PPBV	0.15	U
GRPCE-06-IA-██████████ S)	Tetrachloroethene	0.17		0.024	0.15	PPBV	0.17	
GRPCE-06-IA-██████████ S)	Vinyl Chloride		ND	0.10	0.39	UG/M3	0.39	U
GRPCE-06-IA-██████████ S)	trans-1,2-Dichloroethene		ND	0.14	0.61	UG/M3	0.61	UJ
GRPCE-06-IA-██████████ S)	cis-1,2-Dichloroethene		ND	0.20	0.61	UG/M3	0.61	UJ
GRPCE-06-IA-██████████ S)	Trichloroethene		ND	0.28	0.83	UG/M3	0.83	U
GRPCE-06-IA-██████████ S)	Tetrachloroethene	1.1		0.17	1.0	UG/M3	1.1	
GRPCE-06-IA-██████████ -W)	Vinyl Chloride		ND	0.043	0.16	PPBV	0.16	U
GRPCE-06-IA-██████████ -W)	trans-1,2-Dichloroethene		ND	0.038	0.16	PPBV	0.16	UJ
GRPCE-06-IA-██████████ -W)	cis-1,2-Dichloroethene		ND	0.054	0.16	PPBV	0.16	UJ
GRPCE-06-IA-██████████ -W)	Trichloroethene		ND	0.055	0.16	PPBV	0.16	U
GRPCE-06-IA-██████████ -W)	Tetrachloroethene	0.21		0.026	0.16	PPBV	0.21	
GRPCE-06-IA-██████████ -W)	Vinyl Chloride		ND	0.11	0.42	UG/M3	0.42	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
EUROFINS-AIR TOXICS REPORT NO. 1611159

CLIENTSAMPID	COMPOUND NAME	RESULTS	DATAFLAGS	MDL	REPLMT	UNITS	VALRESULTS	VALFLAGS
GRPCE-06-IA-[REDACTED]-W)	trans-1,2-Dichloroethene	ND		0.15	0.65	UG/M3	0.65	UJ
GRPCE-06-IA-[REDACTED]-W)	cis-1,2-Dichloroethene	ND		0.21	0.65	UG/M3	0.65	UJ
GRPCE-06-IA-[REDACTED]-W)	Trichloroethene	ND		0.30	0.89	UG/M3	0.89	U
GRPCE-06-IA-[REDACTED]-W)	Tetrachloroethene	1.4		0.18	1.1	UG/M3	1.4	
GRPCE-06-IA-[REDACTED]W)-DP	Vinyl Chloride	ND		0.046	0.18	PPBV	0.18	U
GRPCE-06-IA-[REDACTED]W)-DP	trans-1,2-Dichloroethene	ND		0.041	0.18	PPBV	0.18	UJ
GRPCE-06-IA-[REDACTED]W)-DP	cis-1,2-Dichloroethene	ND		0.057	0.18	PPBV	0.18	UJ
GRPCE-06-IA-[REDACTED]W)-DP	Trichloroethene	ND		0.059	0.18	PPBV	0.18	U
GRPCE-06-IA-[REDACTED]W)-DP	Tetrachloroethene	0.18		0.028	0.18	PPBV	0.18	
GRPCE-06-IA-[REDACTED]W)-DP	Vinyl Chloride	ND		0.12	0.45	UG/M3	0.45	U
GRPCE-06-IA-[REDACTED]W)-DP	trans-1,2-Dichloroethene	ND		0.16	0.70	UG/M3	0.70	UJ
GRPCE-06-IA-[REDACTED]W)-DP	cis-1,2-Dichloroethene	ND		0.23	0.70	UG/M3	0.70	UJ
GRPCE-06-IA-[REDACTED]W)-DP	Trichloroethene	ND		0.32	0.94	UG/M3	0.94	U
GRPCE-06-IA-[REDACTED]W)-DP	Tetrachloroethene	1.2		0.19	1.2	UG/M3	1.2	



November 29, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1311**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 19 air samples (including four field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on November 8 and 15, 2016 and were analyzed for volatile organic compounds by ALS Environmental Laboratories and Bureau Veritas Laboratories. Tetra Tech received the final data on November 23, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for these data sets. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
ALS ENVIRONMENTAL SDG P1605258
BUREAU VERITAS SDG 16110911**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1311A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 29 November 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> November 29, 2016	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1605258	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Twelve air samples (including four field duplicates)		
Field Duplicate Pairs	GRPCE-06-IA-[REDACTED] (Main)/GRPCE-06-IA-[REDACTED] (Main)-DP, GRPCE-06-IA-[REDACTED] (Main)/GRPCE-06-IA-[REDACTED] (Main)-DP, GRPCE-06-IA-[REDACTED] (Main)/GRPCE-06-IA-[REDACTED] (Main)-DP, and GRPCE-06-IA-[REDACTED] (Basement)/GRPCE-06-IA-[REDACTED] (Basement)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.50x: VOCs for GRPCE-06-IA- [REDACTED] (Basement) and GRPCE-06-IA- [REDACTED] (Main) 1.56x: VOCs for GRPCE-06-IA- [REDACTED] (Main)-DP and GRPCE-06-IA- [REDACTED] (Main) 1.57x: VOCs for GRPCE-06-IA- [REDACTED] (Main) 1.60x: VOCs for GRPCE-06-IA- [REDACTED] (Basement) 1.62x: VOCs for GRPCE-06-IA- [REDACTED] (Basement) and GRPCE-06-IA- [REDACTED] (Main) 1.64x: VOCs for GRPCE-06-IA- [REDACTED] (Main)-DP and GRPCE-06-IA- [REDACTED] (Basement) 1.70x: VOCs for GRPCE-06-IA- [REDACTED] (Basement)-DP 16.4x: VOCs for GRPCE-06-IA- [REDACTED] (Main)-DP



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY

ALS ENVIRONMENTAL REPORT NO. P1605258

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val. Result	Val_Qualifier
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	0.022	U	ppbV	0.016	0.022	0.022	U
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	0.15	U	ug/m3	0.11	0.15	0.15	U
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	0.22		ppbV	0.016	0.022	0.22	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	1.5		ug/m3	0.11	0.15	1.5	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	0.23		ppbV	0.017	0.023	0.23	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	1.6		ug/m3	0.11	0.16	1.6	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	0.29		ppbV	0.017	0.024	0.29	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.041	U	ppbV	0.037	0.041	0.041	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.03	U	ppbV	0.027	0.03	0.03	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY

ALS ENVIRONMENTAL REPORT NO. P1605258

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val. Result	Val_Qualifier
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.063	U	ppbV	0.06	0.063	0.063	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	2		ug/m3	0.12	0.16	2	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	0.26		ppbV	0.017	0.023	0.26	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	1.8		ug/m3	0.11	0.16	1.8	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	0.26		ppbV	0.017	0.024	0.26	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.031	U	ppbV	0.027	0.031	0.031	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.064	U	ppbV	0.061	0.064	0.064	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	1.8		ug/m3	0.12	0.16	1.8	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.16	U	ug/m3	0.16	0.16	0.16	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	0.15		ppbV	0.017	0.024	0.15	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.031	U	ppbV	0.027	0.031	0.031	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.064	U	ppbV	0.061	0.064	0.064	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	1		ug/m3	0.12	0.16	1	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY

ALS ENVIRONMENTAL REPORT NO. P1605258

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val. Result	Val_Qualifier
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.16	U	ug/m3	0.16	0.16	0.16	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	0.1		ppbV	0.017	0.024	0.1	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.041	U	ppbV	0.037	0.041	0.041	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.03	U	ppbV	0.027	0.03	0.03	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.063	U	ppbV	0.06	0.063	0.063	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	0.69		ug/m3	0.12	0.16	0.69	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.083	U	ppbV	0.076	0.083	0.083	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	0.11		ppbV	0.035	0.048	0.11	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.083	U	ppbV	0.075	0.083	0.083	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.061	U	ppbV	0.054	0.061	0.061	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.13	U	ppbV	0.12	0.13	0.13	U
GRPCE-06-IA-	(Main)-DP	cis-1,2-Dichloroethene	0.33	U	ug/m3	0.3	0.33	0.33	U
GRPCE-06-IA-	(Main)-DP	Tetrachloroethene	0.74		ug/m3	0.24	0.33	0.74	
GRPCE-06-IA-	(Main)-DP	trans-1,2-Dichloroethene	0.33	U	ug/m3	0.3	0.33	0.33	U
GRPCE-06-IA-	(Main)-DP	Trichloroethene (TCE)	0.33	U	ug/m3	0.29	0.33	0.33	U
GRPCE-06-IA-	(Main)-DP	Vinyl Chloride	0.33	U	ug/m3	0.31	0.33	0.33	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	0.22		ppbV	0.017	0.024	0.22	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.03	U	ppbV	0.027	0.03	0.03	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.063	U	ppbV	0.059	0.063	0.063	U
GRPCE-06-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Tetrachloroethene	1.5		ug/m3	0.12	0.16	1.5	
GRPCE-06-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Basement)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-06-IA-	(Basement)-DP	cis-1,2-Dichloroethene	0.043	U	ppbV	0.039	0.043	0.043	U
GRPCE-06-IA-	(Basement)-DP	Tetrachloroethene	0.22		ppbV	0.018	0.025	0.22	

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1605258

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val. Result	Val_Qualifier
GRPCE-06-IA-	(Basement)-DP	trans-1,2-Dichloroethene	0.043	U	ppbV	0.039	0.043	0.043	U
GRPCE-06-IA-	(Basement)-DP	Trichloroethene (TCE)	0.032	U	ppbV	0.028	0.032	0.032	U
GRPCE-06-IA-	(Basement)-DP	Vinyl Chloride	0.067	U	ppbV	0.063	0.067	0.067	U
GRPCE-06-IA-	(Basement)-DP	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-06-IA-	(Basement)-DP	Tetrachloroethene	1.5		ug/m3	0.12	0.17	1.5	
GRPCE-06-IA-	(Basement)-DP	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-06-IA-	(Basement)-DP	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-06-IA-	(Basement)-DP	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	0.19		ppbV	0.017	0.023	0.19	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-06-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Tetrachloroethene	1.3		ug/m3	0.11	0.16	1.3	
GRPCE-06-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1311B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> November 29, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 29 November 2016
Laboratory Report No.	16110911		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		
Laboratory	Bureau Veritas/Novi, MI		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
N	Trichloroethene was detected in the method blank below the associated reporting limit (RL). Therefore, the trichloroethene results below the RLs for samples GRPCE-38-IA- [REDACTED] (BASEMENT), GRPCE-38-IA- [REDACTED] (MAIN), GRPCE-38-IA- [REDACTED], GRPCE-39-IA- [REDACTED] (1), and GRPCE-42-OA- [REDACTED] were raised to the RL and qualified as non-detect (U). Additionally, the trichloroethene result for GRPCE-39-IA- [REDACTED] (2) was less than ten times the associated blank value and was therefore qualified as estimated with a possible high bias (J+). No further qualifications were required because the associated results were greater than ten times the associated blank value.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16110911
 Sample Identification GRPCE-38-IA [REDACTED] BASEMENT Date Sampled: 11/15/2016
 Lab Number: 006A Date Received: 11/15/2016
 Sample Type: Air, Can Analysis Date: 11/16/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.29 psig
 Final Pressure: -1.29 psig
 Canister ID: 13987

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.1	0.019	0.16	0.79	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.214	0.030	0.0039	0.044	1	
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

gaw
11/29/16

General Notes and Qualifiers: -; Information not available or not applicable. B; Analyte detected in the associated Method Blank
 ND; Less than the indicated limit of detection (LOD) S; Spike Recovery outside accepted recovery limits
 RL; Report Limit R; RPD outside accepted recovery limits
 J; Value is between the MDL and Reporting Limit, estimated r T; Tentatively Identified Compound (TIC)
 MDL; Method Detection Limit E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-38-IA (MAIN)

Date Sampled: 11/15/2016

Lab Number: 005A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.37 psig

Final Pressure: -2.37 psig

Canister ID: 14027

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.4	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
11/29/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-38-IA- [REDACTED]

Date Sampled: 11/15/2016

Lab Number: 004A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.42 psig

Final Pressure: -1.42 psig

Canister ID: 14618

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.88	0.036	0.27	0.13	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.7	0.019	0.16	0.67	0.0049	0.04	1	
79-01-6	Trichloroethene	0.15	0.021	0.21	0.030	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
11/29/16

General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-38-IA- [REDACTED]

Date Sampled: 11/15/2016

Lab Number: 003A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.37 psig

Final Pressure: -1.37 psig

Canister ID: 14624

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.6	0.019	0.16	0.41	0.0049	0.04	1	
79-01-6	Trichloroethene	0.54	0.021	0.21	0.10	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
11/29/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-39-IA (redacted) 1)

Date Sampled: 11/15/2016

Lab Number: 001A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.9 psig

Final Pressure: -1.9 psig

Canister ID: 14338

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.28	0.019	0.16	0.070	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16	0.021	0.21	0.030	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

CPW
11/29/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-39-IA (redacted) 2)

Date Sampled: 11/15/2016

Lab Number: 002A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.24 psig

Final Pressure: -2.24 psig

Canister ID: 14010

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U		1
127-18-4	Tetrachloroethene	1.2	0.036	0.27	0.18	0.0053	0.04		1
156-60-5	trans-1,2-Dichloroethene	1.1	0.019	0.16	0.29	0.0049	0.04		1
79-01-6	Trichloroethene	0.21 J+	0.021	0.21	0.040 J+	0.0039	0.04		1
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U		1

DRS
11/29/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 23-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16110911

Sample Identification GRPCE-42-OA [REDACTED]

Date Sampled: 11/15/2016

Lab Number: 007A

Date Received: 11/15/2016

Sample Type: Air, Can

Analysis Date: 11/16/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.24 psig

Final Pressure: -1.24 psig

Canister ID: 14019

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.040 J	0.019	0.16	0.010 J	0.0049	0.04	1	J
79-01-6	Trichloroethene	0.054	0.021	0.21	0.039	0.0039	0.04	1	J
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

DRS
11/29/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



December 19, 2016

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1376**

Dear Ms. Nightingale:

Tetra Tech Inc. (Tetra Tech) is submitting these Data Validation Reports for 39 air samples (including four field duplicates) collected at the Grand Rapids VI ER site. The samples were collected on November 22, 2016 and December 1, 4, 8, and 13, 2016 and were analyzed for volatile organic compounds by Bureau Veritas Laboratories. Tetra Tech received the final data on December 16, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
BUREAU VERITAS SDGS 16111403, 16120051, 16120222, 16120525,
AND 16120814**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1376A		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> December 16, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 December 2016
Laboratory Report No.	16111403		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		
Laboratory	Bureau Veritas/Novi, MI		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-39-IA (REDACTED) BASEMENT)

Date Sampled: 11/22/2016

Lab Number: 006A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.05 psig

Final Pressure: -2.05 psig

Canister ID: 14570

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.0	0.019	0.16	0.50	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 U	ND	0.0088	1	

gaw
12/16/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-39-IA [REDACTED] (MAIN)

Date Sampled: 11/22/2016

Lab Number: 005A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.71 psig

Final Pressure: -1.71 psig

Canister ID: 14403

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.4	0.019	0.16	0.86	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

Jaw
12/16/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-39-IA- [REDACTED]

Date Sampled: 11/22/2016

Lab Number: 004A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.65 psig

Final Pressure: -3.65 psig

Canister ID: 14591

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.7	0.019	0.16	0.44	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-39-IA [REDACTED]

Date Sampled: 11/22/2016

Lab Number: 003A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.94 psig

Final Pressure: -1.94 psig

Canister ID: 14478

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.6	0.019	0.16	0.40	0.0049	0.04	1	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

- , Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated r
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-40-IA [REDACTED] 1)

Date Sampled: 11/22/2016

Lab Number: 001A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.44 psig

Final Pressure: -2.44 psig

Canister ID: 14026

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.56	0.019	0.16	0.14	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-40-IA-XXXXXXXXXX 2)

Date Sampled: 11/22/2016

Lab Number: 002A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.45 psig

Final Pressure: -2.45 psig

Canister ID: 14580

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.2	0.019	0.10	0.31	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.2	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 30-Nov-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16111403

Sample Identification GRPCE-43-OA [REDACTED]

Date Sampled: 11/22/2016

Lab Number: 007A

Date Received: 11/22/2016

Sample Type: Air, Can

Analysis Date: 11/22/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.49 psig

Final Pressure: -0.49 psig

Canister ID: 14075

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.044	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.164	ND	0.0049	0.044	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.101	ND	0.0088	0.044	1	

DRS
12/16/16

General Notes and Qualifiers:

--, Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1376B		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> December 16, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 December 2016
Laboratory Report No.	16120051	Laboratory	Bureau Veritas/Novi, MI
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-40-IA- [REDACTED] GRPCE-40-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-40-IA (REDACTED) BASEMENT)

Date Sampled: 12/1/2016

Lab Number: 007A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.24 psig

Final Pressure: -2.24 psig

Canister ID: 14159

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.9	0.019	0.16	0.72	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

Law
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-40-IA (REDACTED) (MAIN)

Date Sampled: 12/1/2016

Lab Number: 006A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.39 psig

Final Pressure: -2.39 psig

Canister ID: 14534

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.4	0.019	0.16	0.60	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	A
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/1/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-40-IA [REDACTED]

Date Sampled: 12/1/2016

Lab Number: 005A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.12 psig

Final Pressure: -2.12 psig

Canister ID: 14462

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.1	0.019	0.16	0.53	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

—, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-40-IA- [REDACTED]

Date Sampled: 12/1/2016

Lab Number: 003A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.42 psig

Final Pressure: -2.42 psig

Canister ID: 14578

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.4	0.019	0.16	0.35	0.0049	0.04	1	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

John
12/16/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-40-IA-██████████ DP

Date Sampled: 12/1/2016

Lab Number: 004A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.31 psig

Final Pressure: -3.31 psig

Canister ID: 13990

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.5	0.019	0.16	0.39	0.0049	0.04	1	
79-01-6	Trichloroethene	0.32	0.021	0.21	0.060	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-41-IA [REDACTED] 1)

Date Sampled: 12/1/2016

Lab Number: 001A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.09 psig

Final Pressure: -2.09 psig

Canister ID: 13997

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.12 J	0.019	0.16	0.030 J	0.0049	0.04	1	✓
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022		0.10 U	ND	0.0088	1	0.04 U

gaw
12/16/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-41-IA-[REDACTED] 2)

Date Sampled: 12/1/2016

Lab Number: 002A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.23 psig

Final Pressure: -2.23 psig

Canister ID: 14617

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.59	0.019	0.16	0.15	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 02-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120051

Sample Identification GRPCE-44-OA [REDACTED]

Date Sampled: 12/1/2016

Lab Number: 008A

Date Received: 12/1/2016

Sample Type: Air, Can

Analysis Date: 12/1/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.64 psig

Final Pressure: -2.64 psig

Canister ID: 14574

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

DRS
12/1/16

General Notes and Qualifiers:

- ; Information not available or not applicable.
- ND; Less than the indicated limit of detection (LOD)
- RL; Report Limit
- J; Value is between the MDL and Reporting Limit, estimated
- MDL; Method Detection Limit
- B; Analyte detected in the associated Method Blank
- S; Spike Recovery outside accepted recovery limits
- R; RPD outside accepted recovery limits
- T; Tentatively Identified Compound (TIC)
- E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1376C		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> December 16, 2016	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 December 2016
Laboratory Report No.	16120222		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Seven air samples		
Field Duplicate Pairs	None		
Field Blanks	None		
Laboratory	Bureau Veritas/Novi, MI		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE Work Order No: 16120222
 Sample Identification GRPCE-41-IA [REDACTED] BASEMENT Date Sampled: 12/4/2016
 Lab Number: 006A Date Received: 12/5/2016
 Sample Type: Air, Can Analysis Date: 12/5/2016
 Test Method: EPA Method TO-15A Analyst: DRS
 Initial Pressure: -1.65 psig
 Final Pressure: -1.65 psig
 Canister ID: 14211

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.5	0.019	0.16	1.9	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.104	ND	0.0088	0.044	1	

gaw
12/16/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-41-IA [REDACTED] (MAIN)

Date Sampled: 12/4/2016

Lab Number: 005A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.19 psig

Final Pressure: -2.19 psig

Canister ID: 14229

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	0.71	0.019	0.16	0.18	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-41-IA- [REDACTED]

Date Sampled: 12/4/2016

Lab Number: 004A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.26 psig

Final Pressure: -2.26 psig

Canister ID: 13999

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.81	0.036	0.27	0.12	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	7.9	0.019	0.16	2.0	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

-, Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-41-IA-1168(MAIN)

Date Sampled: 12/4/2016

Lab Number: 003A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.91 psig

Final Pressure: -1.91 psig

Canister ID: 14068

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual	
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	U	ND	0.0061	0.04	U	1
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04			1
156-60-5	trans-1,2-Dichloroethene	6.8	0.019	0.16	1.7	0.0049	0.04			1
79-01-6	Trichloroethene	0.38	0.021	0.21	0.070	0.0039	0.04			1
75-01-4	Vinyl Chloride	ND	0.022	0.10	U	ND	0.0088	0.04	U	1

gaw
12/16/16

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-42-IA ()

Date Sampled: 12/4/2016

Lab Number: 001A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.96 psig

Final Pressure: -2.96 psig

Canister ID: 14396

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.3	0.019	0.16	0.33	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-42-IA (redacted) 2)

Date Sampled: 12/4/2016

Lab Number: 002A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.65 psig

Final Pressure: -2.65 psig

Canister ID: 14076

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.6	0.019	0.16	0.90	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11	0.021	0.21	0.020	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 06-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120222

Sample Identification GRPCE-45-OA [REDACTED]

Date Sampled: 12/4/2016

Lab Number: 007A

Date Received: 12/5/2016

Sample Type: Air, Can

Analysis Date: 12/5/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.17 psig

Final Pressure: -2.17 psig

Canister ID: 14291

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1376D	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 December 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> December 16, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16120525	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-42-IA- [REDACTED] MAIN)/GRPCE-42-IA- [REDACTED] MAIN)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-42-1A [REDACTED] BASEMENT)

Date Sampled: 12/8/2016

Lab Number: 007A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.02 psig

Final Pressure: -2.02 psig

Canister ID: 14579

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	10	0.019	0.16	2.6	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-42-IA [REDACTED] (MAIN)

Date Sampled: 12/8/2016

Lab Number: 005A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.64 psig

Final Pressure: -2.64 psig

Canister ID: 14069

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.9	0.019	0.16	0.49	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
12/11/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-42-IA [REDACTED] (MAIN)-DP

Date Sampled: 12/8/2016

Lab Number: 006A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.27 psig

Final Pressure: -2.27 psig

Canister ID: 14609

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.2	0.019	0.16	0.56	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-42-IA-██████ (BASEMENT)

Date Sampled: 12/8/2016

Lab Number: 004A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.8 psig

Final Pressure: -2.8 psig

Canister ID: 13995

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.4	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-42-IA [REDACTED]

Date Sampled: 12/8/2016

Lab Number: 003A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.84 psig

Final Pressure: -2.84 psig

Canister ID: 14399

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.34	0.036	0.27	0.050	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	3.8	0.019	0.16	0.97	0.0049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-43-IA [REDACTED] 1)

Date Sampled: 12/8/2016

Lab Number: 001A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.61 psig

Final Pressure: -2.61 psig

Canister ID: 14133

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	1
127-18-4	Tetrachloroethene	0.20 J	0.036	0.27	0.030 J	0.0053	0.04	1	1
156-60-5	trans-1,2-Dichloroethene	0.24	0.019	0.16	0.060	0.0049	0.04	1	1
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10	u	ND	0.0088	1	u

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-43-IA [REDACTED] (2)

Date Sampled: 12/8/2016

Lab Number: 002A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/8/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.0 psig

Final Pressure: -3.0 psig

Canister ID: 14028

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.2	0.019	0.16	0.31	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	/
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 12-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120525

Sample Identification GRPCE-46-OA [REDACTED]

Date Sampled: 12/8/2016

Lab Number: 008A

Date Received: 12/8/2016

Sample Type: Air, Can

Analysis Date: 12/9/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.52 psig

Final Pressure: -2.52 psig

Canister ID: 14576

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.068 J	0.036	0.27	0.010 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	ND	0.021	0.21	ND	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1376E	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 19 December 2016
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> December 16, 2016	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	16120814	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Nine air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-43-IA- [REDACTED] BASEMENT)/GRPCE-43-IA- [REDACTED] BASEMENT)-DP and GRPCE-43-IA- [REDACTED] GRPCE-43-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (September 2016).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA [REDACTED] (BASEMENT)

Date Sampled: 12/13/2016

Lab Number: 007A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.17 psig

Final Pressure: -2.17 psig

Canister ID: 14541

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.7	0.019	0.16	2.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

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12/16/16

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA [REDACTED] BASEMENT)-DP

Date Sampled: 12/13/2016

Lab Number: 008A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.09 psig

Final Pressure: -2.09 psig

Canister ID: 14073

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	NB	0.024	0.16 _U	NB	0.0061	0.04 _U	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.6	0.019	0.16	2.2	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 _J	0.021	0.21	0.020 _J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	NB	0.022	0.10 _U	NB	0.0088	0.04 _U	1	

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12/16/16

General Notes and Qualifiers:

- : Information not available or not applicable.
- ND: Less than the indicated limit of detection (LOD)
- RL: Report Limit
- J: Value is between the MDL and Reporting Limit, estimated r
- MDL: Method Detection Limit
- B: Analyte detected in the associated Method Blank
- S: Spike Recovery outside accepted recovery limits
- R: RPD outside accepted recovery limits
- T: Tentatively Identified Compound (TIC)
- E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA- [REDACTED] (MAIN)

Date Sampled: 12/13/2016

Lab Number: 006A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: 2.62 psig

Final Pressure: 2.62 psig

Canister ID: 14121

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.3	0.019	0.16	0.33	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

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12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA- [REDACTED]

Date Sampled: 12/13/2016

Lab Number: 004A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.79 psig

Final Pressure: -2.79 psig

Canister ID: 14126

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16U	ND	0.0061	0.04U	1	
127-18-4	Tetrachloroethene	0.68	0.036	0.27	0.10	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	6.0	0.019	0.16	1.5	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10U	ND	0.0088	0.04U	1	

John
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA-1168(BASEMENT)-DP

Date Sampled: 12/13/2016

Lab Number: 005A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -3.38 psig

Final Pressure: -3.38 psig

Canister ID: 14124

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.2	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
12/16/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-43-IA [REDACTED]

Date Sampled: 12/13/2016

Lab Number: 003A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.54 psig

Final Pressure: -2.54 psig

Canister ID: 14079

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.4	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.21	0.021	0.21	0.040	0.0039	0.04	1	
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

DRS
12/16/16

General Notes and Qualifiers:

-; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-44-IA [REDACTED] 1)

Date Sampled: 12/13/2016

Lab Number: 001A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.44 psig

Final Pressure: -2.44 psig

Canister ID: 14582

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.079 J	0.024	0.16	0.020 J	0.061	0.04	1	✓
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.0	0.019	0.16	0.26	0.049	0.04	1	
79-01-6	Trichloroethene	0.16 J	0.021	0.21	0.030 J	0.039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.088	0.04 U	1	

gaw
12/16/16

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-44-IA-[REDACTED] 2)

Date Sampled: 12/13/2016

Lab Number: 002A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.88 psig

Final Pressure: -2.88 psig

Canister ID: 14294

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 <u>U</u>	ND	0.0061	0.04 <u>U</u>	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.1	0.019	0.16	0.54	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 <u>J</u>	0.021	0.21	0.020 <u>J</u>	0.0039	0.04	1	1
75-01-4	Vinyl Chloride	ND	0.022	0.10 <u>U</u>	ND	0.0088	0.04 <u>U</u>	1	

Jan
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 15-Dec-16

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 16120814

Sample Identification GRPCE-47-OA-XXXXXXXXXX

Date Sampled: 12/13/2016

Lab Number: 009A

Date Received: 12/14/2016

Sample Type: Air, Can

Analysis Date: 12/14/2016

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -1.74 psig

Final Pressure: -1.74 psig

Canister ID: 14134

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	0.16 U	ND	0.0061	0.04	1
127-18-4	Tetrachloroethene	0.27	0.036	0.27	0.040	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	0.16 U	ND	0.0049	0.04	1
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	0.10 U	ND	0.0088	0.04	1

Open
12/16/16

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



January 5, 2017

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1415**

Dear Ms. Nightingale:

Tetra Tech, Inc. (Tetra Tech) is submitting this Data Validation Report for six air samples (including a field duplicate) collected at the Grand Rapids VI ER site. The samples were collected on December 13, 2016 and were analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the data on December 27, 2016.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
ALS SDG P1605832**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1415	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 5 January 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> January 5, 2017	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1605832		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	Six air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-07-IA- [REDACTED] W)/GRPCE-07-IA- [REDACTED] W)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
N	The percent relative standard deviation exceeded the acceptance limit for trichloroethene; therefore, the associated non-detect results were qualified as estimated (UJ).

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent difference exceeded the acceptance limit for trichloroethene; therefore, the associated non-detect results were qualified as estimated (UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.49x: VOCs for GRPCE-07-IA-[REDACTED] W)-DP 1.50x: VOCs for GRPCE-07-IA-[REDACTED] N) 1.53x: VOCs for GRPCE-07-IA-[REDACTED] Common) 1.55x: VOCs for GRPCE-07-IA-[REDACTED] W) 1.57x: VOCs for GRPCE-07-IA-[REDACTED] W) 1.58x: VOCs for GRPCE-07-IA-[REDACTED] S)

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1605832

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-06-IA-	W)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	W)	Tetrachloroethene	0.025		ppbV	0.016	0.023	0.025	
GRPCE-06-IA-	W)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-06-IA-	W)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	UJ
GRPCE-06-IA-	W)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-06-IA-	W)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	W)	Tetrachloroethene	0.17		ug/m3	0.11	0.16	0.17	
GRPCE-06-IA-	W)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-06-IA-	W)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	UJ
GRPCE-06-IA-	W)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-07-IA-	N)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-07-IA-	N)	Tetrachloroethene	0.029		ppbV	0.016	0.022	0.029	
GRPCE-07-IA-	N)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-07-IA-	N)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	UJ
GRPCE-07-IA-	N)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-07-IA-	N)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-	N)	Tetrachloroethene	0.2		ug/m3	0.11	0.15	0.2	
GRPCE-07-IA-	N)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-	N)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	UJ
GRPCE-07-IA-	N)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-	S)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-07-IA-	S)	Tetrachloroethene	0.093		ppbV	0.017	0.023	0.093	
GRPCE-07-IA-	S)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-07-IA-	S)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	UJ
GRPCE-07-IA-	S)	Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-07-IA-	S)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-07-IA-	S)	Tetrachloroethene	0.63		ug/m3	0.11	0.16	0.63	
GRPCE-07-IA-	S)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	S)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	UJ
GRPCE-07-IA-	S)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-07-IA-	W)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-07-IA-	W)	Tetrachloroethene	0.074		ppbV	0.017	0.023	0.074	
GRPCE-07-IA-	W)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-07-IA-	W)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	UJ

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1605832

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-07-IA-		W)	Vinyl Chloride	0.061 U	ppbV	0.058	0.061	0.061 U	
GRPCE-07-IA-		W)	cis-1,2-Dichloroethene	0.16 U	ug/m3	0.14	0.16	0.16 U	
GRPCE-07-IA-		W)	Tetrachloroethene	0.5	ug/m3	0.11	0.16	0.5	
GRPCE-07-IA-		W)	trans-1,2-Dichloroethene	0.16 U	ug/m3	0.14	0.16	0.16 U	
GRPCE-07-IA-		W)	Trichloroethene (TCE)	0.16 U	ug/m3	0.14	0.16	0.16 UJ	
GRPCE-07-IA-		W)	Vinyl Chloride	0.16 U	ug/m3	0.15	0.16	0.16 U	
GRPCE-07-IA-		W)-DP	cis-1,2-Dichloroethene	0.038 U	ppbV	0.035	0.038	0.038 U	
GRPCE-07-IA-		W)-DP	Tetrachloroethene	0.072	ppbV	0.016	0.022	0.072	
GRPCE-07-IA-		W)-DP	trans-1,2-Dichloroethene	0.038 U	ppbV	0.034	0.038	0.038 U	
GRPCE-07-IA-		W)-DP	Trichloroethene (TCE)	0.028 U	ppbV	0.025	0.028	0.028 UJ	
GRPCE-07-IA-		W)-DP	Vinyl Chloride	0.058 U	ppbV	0.055	0.058	0.058 U	
GRPCE-07-IA-		W)-DP	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-07-IA-		W)-DP	Tetrachloroethene	0.49	ug/m3	0.11	0.15	0.49	
GRPCE-07-IA-		W)-DP	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-07-IA-		W)-DP	Trichloroethene (TCE)	0.15 U	ug/m3	0.13	0.15	0.15 UJ	
GRPCE-07-IA-		W)-DP	Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-07-IA-		Common)	cis-1,2-Dichloroethene	0.039 U	ppbV	0.036	0.039	0.039 U	
GRPCE-07-IA-		Common)	Tetrachloroethene	0.027	ppbV	0.016	0.023	0.027	
GRPCE-07-IA-		Common)	trans-1,2-Dichloroethene	0.039 U	ppbV	0.035	0.039	0.039 U	
GRPCE-07-IA-		Common)	Trichloroethene (TCE)	0.028 U	ppbV	0.025	0.028	0.028 UJ	
GRPCE-07-IA-		Common)	Vinyl Chloride	0.06 U	ppbV	0.057	0.06	0.06 U	
GRPCE-07-IA-		Common)	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-07-IA-		Common)	Tetrachloroethene	0.18	ug/m3	0.11	0.15	0.18	
GRPCE-07-IA-		Common)	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-07-IA-		Common)	Trichloroethene (TCE)	0.15 U	ug/m3	0.14	0.15	0.15 UJ	
GRPCE-07-IA-		Common)	Vinyl Chloride	0.15 U	ug/m3	0.15	0.15	0.15 U	



January 31, 2017

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1466**

Dear Ms. Nightingale:

Tetra Tech, Inc. (Tetra Tech) is submitting these Data Validation Reports for 31 air samples (including three field duplicates) collected at the Grand Rapids VI ER site. The samples were collected from January 17 through 20, 2017 and were analyzed for volatile organic compounds by ALS Environmental Laboratories and Bureau Veritas Laboratories. Tetra Tech received the last of the final data on January 30, 2017.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for these data sets. The data is usable as reported by the laboratory.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
ALS ENVIRONMENTAL SDG P1700274
BUREAU VERITAS SDG 17010564**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1466A	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 31 January 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> January 31, 2017	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1700274	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	23 air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-01-IA- [REDACTED] (HVAC Basement)/GRPCE-01-IA- [REDACTED] (HVAC Basement)-DP and GRPCE-02-SS- [REDACTED] GRPCE-02-SS- [REDACTED] -DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.34x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.37x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.38x: VOCs except tetrachloroethene for GRPCE-01-SS- [REDACTED]
	1.43x: VOCs for GRPCE-02-IA- [REDACTED] (HBI)
	1.45x: VOCs for GRPCE-02-IA- [REDACTED] (West Dining Hall) and GRPCE-02-OA- [REDACTED]
	1.46x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.47x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED] DP and GRPCE-02-SS- [REDACTED]
	1.47x: VOCs for GRPCE-02-SS- [REDACTED] ([REDACTED]) and GRPCE-02-SS- [REDACTED] (HBI)
	1.49x: VOCs for GRPCE-01-IA- [REDACTED] (HVAC Basement)-DP and GRPCE-01-IA- [REDACTED] (Basement)
	1.50x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.51x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.52x: VOCs for GRPCE-01-IA- [REDACTED] (HVAC Basement)
	1.53x: VOCs for GRPCE-02-IA- [REDACTED]
	1.55x: VOCs for GRPCE-01-IA- [REDACTED] (Main), GRPCE-01-SS- [REDACTED] (HVAC Basement), and GRPCE-07-IA- [REDACTED]
	1.85x: VOCs for GRPCE-02-IA- [REDACTED] ([REDACTED])
	2.09x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	2.60x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	2.68x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	2.76x: tetrachloroethene for GRPCE-01-SS- [REDACTED]
	2.94x: tetrachloroethene for GRPCE-02-SS- [REDACTED] DP
	2.98x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	5.21x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	6.39x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	20.0x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	33.6x: tetrachloroethene for GRPCE-02-SS- [REDACTED]



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700274

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(HVAC Basement)	cis-1,2-Dichloroethene	0.038 U	ppbV	0.035	0.038	0.038 U	
GRPCE-01-IA-	(HVAC Basement)	Tetrachloroethene	0.25	ppbV	0.016	0.022	0.25	
GRPCE-01-IA-	(HVAC Basement)	trans-1,2-Dichloroethene	0.038 U	ppbV	0.035	0.038	0.038 U	
GRPCE-01-IA-	(HVAC Basement)	Trichloroethene (TCE)	0.028 U	ppbV	0.025	0.028	0.028 U	
GRPCE-01-IA-	(HVAC Basement)	Vinyl Chloride	0.059 U	ppbV	0.057	0.059	0.059 U	
GRPCE-01-IA-	(HVAC Basement)	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement)	Tetrachloroethene	1.7	ug/m3	0.11	0.15	1.7	
GRPCE-01-IA-	(HVAC Basement)	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement)	Trichloroethene (TCE)	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement)	Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement) -DP	cis-1,2-Dichloroethene	0.038 U	ppbV	0.035	0.038	0.038 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Tetrachloroethene	0.24	ppbV	0.016	0.022	0.24	
GRPCE-01-IA-	(HVAC Basement) -DP	trans-1,2-Dichloroethene	0.038 U	ppbV	0.034	0.038	0.038 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Trichloroethene (TCE)	0.028 U	ppbV	0.025	0.028	0.028 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Vinyl Chloride	0.058 U	ppbV	0.055	0.058	0.058 U	
GRPCE-01-IA-	(HVAC Basement) -DP	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Tetrachloroethene	1.6	ug/m3	0.11	0.15	1.6	
GRPCE-01-IA-	(HVAC Basement) -DP	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Trichloroethene (TCE)	0.15 U	ug/m3	0.13	0.15	0.15 U	
GRPCE-01-IA-	(HVAC Basement) -DP	Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038 U	ppbV	0.035	0.038	0.038 U	
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.062	ppbV	0.016	0.022	0.062	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038 U	ppbV	0.034	0.038	0.038 U	
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028 U	ppbV	0.025	0.028	0.028 U	
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.058 U	ppbV	0.055	0.058	0.058 U	
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.42	ug/m3	0.11	0.15	0.42	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15 U	ug/m3	0.13	0.15	0.15 U	
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15 U	
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.039 U	ppbV	0.036	0.039	0.039 U	
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.047	ppbV	0.016	0.023	0.047	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.039 U	ppbV	0.036	0.039	0.039 U	

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Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.32		ug/m3	0.11	0.16	0.32	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.098		ppbV	0.015	0.02	0.098	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.035	U	ppbV	0.031	0.035	0.035	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.026	U	ppbV	0.023	0.026	0.026	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.054	U	ppbV	0.051	0.054	0.054	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.66		ug/m3	0.099	0.14	0.66	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.093		ppbV	0.016	0.022	0.093	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.63		ug/m3	0.11	0.15	0.63	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-SS-	(HVAC Basement)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-SS-	(HVAC Basement)	Tetrachloroethene	4.5		ppbV	0.016	0.023	4.5	
GRPCE-01-SS-	(HVAC Basement)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-SS-	(HVAC Basement)	Trichloroethene (TCE)	0.07		ppbV	0.026	0.029	0.07	
GRPCE-01-SS-	(HVAC Basement)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-01-SS-	(HVAC Basement)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U

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Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-SS-██████████ (HVAC Basement)	Tetrachloroethene	31		ug/m3	0.11	0.16	31	
GRPCE-01-SS-██████████ (HVAC Basement)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-SS-██████████ (HVAC Basement)	Trichloroethene (TCE)	0.37		ug/m3	0.14	0.16	0.37	
GRPCE-01-SS-██████████ (HVAC Basement)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-SS-██████████	cis-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-SS-██████████	Tetrachloroethene	30	D	ppbV	0.029	0.041	30	
GRPCE-01-SS-██████████	trans-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-SS-██████████	Trichloroethene (TCE)	0.3		ppbV	0.023	0.026	0.3	
GRPCE-01-SS-██████████	Vinyl Chloride	0.054	U	ppbV	0.051	0.054	0.054	U
GRPCE-01-SS-██████████	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-SS-██████████	Tetrachloroethene	210	D	ug/m3	0.2	0.28	210	
GRPCE-01-SS-██████████	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-SS-██████████	Trichloroethene (TCE)	1.6		ug/m3	0.12	0.14	1.6	
GRPCE-01-SS-██████████	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-IA-██████████ (██████████)	cis-1,2-Dichloroethene	0.047	U	ppbV	0.043	0.047	0.047	U
GRPCE-02-IA-██████████ (██████████)	Tetrachloroethene	0.51		ppbV	0.02	0.027	0.51	
GRPCE-02-IA-██████████ (██████████)	trans-1,2-Dichloroethene	0.047	U	ppbV	0.042	0.047	0.047	U
GRPCE-02-IA-██████████ (██████████)	Trichloroethene (TCE)	0.034	U	ppbV	0.031	0.034	0.034	U
GRPCE-02-IA-██████████ (██████████)	Vinyl Chloride	0.072	U	ppbV	0.069	0.072	0.072	U
GRPCE-02-IA-██████████ (██████████)	cis-1,2-Dichloroethene	0.19	U	ug/m3	0.17	0.19	0.19	U
GRPCE-02-IA-██████████ (██████████)	Tetrachloroethene	3.4		ug/m3	0.13	0.19	3.4	
GRPCE-02-IA-██████████ (██████████)	trans-1,2-Dichloroethene	0.19	U	ug/m3	0.17	0.19	0.19	U
GRPCE-02-IA-██████████ (██████████)	Trichloroethene (TCE)	0.19	U	ug/m3	0.16	0.19	0.19	U
GRPCE-02-IA-██████████ (██████████)	Vinyl Chloride	0.19	U	ug/m3	0.18	0.19	0.19	U
GRPCE-02-IA-██████████ (HBI)	cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-IA-██████████ (HBI)	Tetrachloroethene	0.023		ppbV	0.015	0.021	0.023	
GRPCE-02-IA-██████████ (HBI)	trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-IA-██████████ (HBI)	Trichloroethene (TCE)	0.057		ppbV	0.024	0.027	0.057	
GRPCE-02-IA-██████████ (HBI)	Vinyl Chloride	0.056	U	ppbV	0.053	0.056	0.056	U
GRPCE-02-IA-██████████ (HBI)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-IA-██████████ (HBI)	Tetrachloroethene	0.16		ug/m3	0.1	0.14	0.16	
GRPCE-02-IA-██████████ (HBI)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-IA-██████████ (HBI)	Trichloroethene (TCE)	0.31		ug/m3	0.13	0.14	0.31	

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GRPCE-02-IA-	(HBI)	Vinyl Chloride	0.14 U	ug/m3	0.14	0.14	0.14	U
GRPCE-02-IA-	(West Dining Hall)	cis-1,2-Dichloroethene	0.037 U	ppbV	0.034	0.037	0.037	U
GRPCE-02-IA-	(West Dining Hall)	Tetrachloroethene	0.045	ppbV	0.015	0.021	0.045	
GRPCE-02-IA-	(West Dining Hall)	trans-1,2-Dichloroethene	0.037 U	ppbV	0.033	0.037	0.037	U
GRPCE-02-IA-	(West Dining Hall)	Trichloroethene (TCE)	0.027 U	ppbV	0.024	0.027	0.027	U
GRPCE-02-IA-	(West Dining Hall)	Vinyl Chloride	0.057 U	ppbV	0.054	0.057	0.057	U
GRPCE-02-IA-	(West Dining Hall)	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(West Dining Hall)	Tetrachloroethene	0.3	ug/m3	0.1	0.15	0.3	
GRPCE-02-IA-	(West Dining Hall)	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(West Dining Hall)	Trichloroethene (TCE)	0.15 U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(West Dining Hall)	Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-		cis-1,2-Dichloroethene	0.039 U	ppbV	0.036	0.039	0.039	U
GRPCE-02-IA-		Tetrachloroethene	0.28	ppbV	0.016	0.023	0.28	
GRPCE-02-IA-		trans-1,2-Dichloroethene	0.039 U	ppbV	0.035	0.039	0.039	U
GRPCE-02-IA-		Trichloroethene (TCE)	0.075	ppbV	0.025	0.028	0.075	
GRPCE-02-IA-		Vinyl Chloride	0.06 U	ppbV	0.057	0.06	0.06	U
GRPCE-02-IA-		cis-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-		Tetrachloroethene	1.9	ug/m3	0.11	0.15	1.9	
GRPCE-02-IA-		trans-1,2-Dichloroethene	0.15 U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-		Trichloroethene (TCE)	0.4	ug/m3	0.14	0.15	0.4	
GRPCE-02-IA-		Vinyl Chloride	0.15 U	ug/m3	0.15	0.15	0.15	U
GRPCE-02-OA-		cis-1,2-Dichloroethene	0.037 U	ppbV	0.034	0.037	0.037	U
GRPCE-02-OA-		Tetrachloroethene	0.021 U	ppbV	0.015	0.021	0.021	U
GRPCE-02-OA-		trans-1,2-Dichloroethene	0.037 U	ppbV	0.033	0.037	0.037	U
GRPCE-02-OA-		Trichloroethene (TCE)	0.033	ppbV	0.024	0.027	0.033	
GRPCE-02-OA-		Vinyl Chloride	0.057 U	ppbV	0.054	0.057	0.057	U
GRPCE-02-OA-		cis-1,2-Dichloroethene	0.15 U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-OA-		Tetrachloroethene	0.15 U	ug/m3	0.1	0.15	0.15	U
GRPCE-02-OA-		trans-1,2-Dichloroethene	0.15 U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-OA-		Trichloroethene (TCE)	0.18	ug/m3	0.13	0.15	0.18	
GRPCE-02-OA-		Vinyl Chloride	0.15 U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.037 U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-		Tetrachloroethene	16	ppbV	0.016	0.022	16	

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GRPCE-02-SS-		trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-SS-		Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		Tetrachloroethene	110		ug/m3	0.11	0.15	110	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-		Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	(HBI)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	(HBI)	Tetrachloroethene	12		ppbV	0.016	0.022	12	
GRPCE-02-SS-	(HBI)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	(HBI)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-SS-	(HBI)	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-02-SS-	(HBI)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	(HBI)	Tetrachloroethene	83		ug/m3	0.11	0.15	83	
GRPCE-02-SS-	(HBI)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-	(HBI)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-	(HBI)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-		Tetrachloroethene	84	D	ppbV	0.068	0.094	84	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.037		ppbV	0.024	0.027	0.037	
GRPCE-02-SS-		Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		Tetrachloroethene	570	D	ug/m3	0.46	0.64	570	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.2		ug/m3	0.13	0.15	0.2	
GRPCE-02-SS-		Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.034	U	ppbV	0.031	0.034	0.034	U
GRPCE-02-SS-		Tetrachloroethene	34	D	ppbV	0.028	0.04	34	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.034	U	ppbV	0.031	0.034	0.034	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.14		ppbV	0.022	0.025	0.14	
GRPCE-02-SS-		Vinyl Chloride	0.052	U	ppbV	0.05	0.052	0.052	U

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GRPCE-02-SS-		0.13	U	ug/m3	0.12	0.13	0.13	U
GRPCE-02-SS-		230	D	ug/m3	0.19	0.27	230	
GRPCE-02-SS-		0.13	U	ug/m3	0.12	0.13	0.13	U
GRPCE-02-SS-		0.77		ug/m3	0.12	0.13	0.77	
GRPCE-02-SS-		0.13	U	ug/m3	0.13	0.13	0.13	U
GRPCE-02-SS-	DP	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	DP	34	D	ppbV	0.031	0.043	34	
GRPCE-02-SS-	DP	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	DP	0.15		ppbV	0.024	0.027	0.15	
GRPCE-02-SS-	DP	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-02-SS-	DP	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	DP	230	D	ug/m3	0.21	0.29	230	
GRPCE-02-SS-	DP	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-	DP	0.83		ug/m3	0.13	0.15	0.83	
GRPCE-02-SS-	DP	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-02-SS-		370	D	ppbV	0.36	0.5	370	
GRPCE-02-SS-		0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-02-SS-		0.87		ppbV	0.025	0.028	0.87	
GRPCE-02-SS-		0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-02-SS-		0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		2500	D	ug/m3	2.4	3.4	2500	
GRPCE-02-SS-		0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		4.7		ug/m3	0.13	0.15	4.7	
GRPCE-02-SS-		0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		0.066	U	ppbV	0.06	0.066	0.066	U
GRPCE-02-SS-		77	D	ppbV	0.21	0.3	77	
GRPCE-02-SS-		0.066	U	ppbV	0.06	0.066	0.066	U
GRPCE-02-SS-		0.048	U	ppbV	0.043	0.048	0.048	U
GRPCE-02-SS-		0.1	U	ppbV	0.097	0.1	0.1	U
GRPCE-02-SS-		0.26	U	ug/m3	0.24	0.26	0.26	U
GRPCE-02-SS-		520	D	ug/m3	1.4	2	520	
GRPCE-02-SS-		0.26	U	ug/m3	0.24	0.26	0.26	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700274

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-	Trichloroethene (TCE)	0.26	U	ug/m3	0.23	0.26	0.26	U
GRPCE-02-SS-	Vinyl Chloride	0.26	U	ug/m3	0.25	0.26	0.26	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.053	U	ppbV	0.048	0.053	0.053	U
GRPCE-02-SS-	Tetrachloroethene	41	D	ppbV	0.032	0.044	41	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.053	U	ppbV	0.048	0.053	0.053	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.048		ppbV	0.035	0.039	0.048	
GRPCE-02-SS-	Vinyl Chloride	0.082	U	ppbV	0.078	0.082	0.082	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.21	U	ug/m3	0.19	0.21	0.21	U
GRPCE-02-SS-	Tetrachloroethene	280	D	ug/m3	0.21	0.3	280	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.21	U	ug/m3	0.19	0.21	0.21	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.26		ug/m3	0.19	0.21	0.26	
GRPCE-02-SS-	Vinyl Chloride	0.21	U	ug/m3	0.2	0.21	0.21	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	Tetrachloroethene	60	D	ppbV	0.055	0.077	60	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.18		ppbV	0.024	0.027	0.18	
GRPCE-02-SS-	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-	Tetrachloroethene	410	D	ug/m3	0.38	0.52	410	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.96		ug/m3	0.13	0.15	0.96	
GRPCE-02-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-07-IA-	Tetrachloroethene	0.043		ppbV	0.016	0.023	0.043	
GRPCE-07-IA-	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-07-IA-	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-07-IA-	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-07-IA-	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	Tetrachloroethene	0.29		ug/m3	0.11	0.16	0.29	
GRPCE-07-IA-	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1466B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 31 January 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> January 31, 2017	Laboratory	Bureau Veritas/Novi, MI
Laboratory Report No.	17010564	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	Eight air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-44-IA- [REDACTED] GRPCE-44-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
NA	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	The laboratory qualified results between the RL and method detection limit as estimated (J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.





ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-44-IA [REDACTED] (BASEMENT)

Date Sampled: 1/17/2017

Lab Number: 007A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -0.99 psig

Final Pressure: -0.99 psig

Canister ID: 14629

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.95	0.036	0.27	0.14	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	8.4	0.019	0.16	2.1	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
01/21/17

General Notes and Qualifiers:

--: Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J: Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B: Analyte detected in the associated Method Blank
 S: Spike Recovery outside accepted recovery limits
 R: RPD outside accepted recovery limits
 T: Tentatively Identified Compound (TIC)
 E: Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-44-IA-██████████(MAIN)

Date Sampled: 1/17/2017

Lab Number: 006A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.35 psig

Final Pressure: -2.35 psig

Canister ID: 14008

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.164	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.47	0.036	0.27	0.070	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.8	0.019	0.16	0.46	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
01/31/17

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-44-IA- [REDACTED]

Date Sampled: 1/17/2017

Lab Number: 005A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.39 psig

Final Pressure: -2.39 psig

Canister ID: 14573

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.75	0.036	0.27	0.11	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.5	0.019	0.16	1.4	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
01/31/17

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-44-IA-1168(MAIN)

Date Sampled: 1/17/2017

Lab Number: 003A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.06 psig

Final Pressure: -2.06 psig

Canister ID: 14032

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16 U	ND	0.0061	0.04 U	1	
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.2	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
01/31/17

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-44-IA-██████████ DP

Date Sampled: 1/17/2017

Lab Number: 004A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.03 psig

Final Pressure: -2.03 psig

Canister ID: 14479

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.61	0.036	0.27	0.090	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	5.3	0.019	0.16	1.3	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0038	0.04	1	

gaw
01/31/17

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL: Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-45-IA [REDACTED] 1)

Date Sampled: 1/17/2017

Lab Number: 001A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.37 psig

Final Pressure: -2.37 psig

Canister ID: 14293

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	0.040 J	0.024	0.16	0.010 J	0.0061	0.04	1	✓
127-18-4	Tetrachloroethene	0.54	0.036	0.27	0.080	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	1.5	0.019	0.16	0.37	0.0049	0.04	1	
79-01-6	Trichloroethene	0.11 J	0.021	0.21	0.020 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10 U	ND	0.0088	0.04 U	1	

gaw
01/31/17

General Notes and Qualifiers:

—; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH

Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-45-IA [REDACTED] 2)

Date Sampled: 1/17/2017

Lab Number: 002A

Date Received: 1/18/2017

Sample Type: Air, Can

Analysis Date: 1/20/2017

Test Method: EPA Method TO-15A

Analyst: DRS

Initial Pressure: -2.2 psig

Final Pressure: -2.2 psig

Canister ID: 14461

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.41	0.036	0.27	0.060	0.0053	0.04	1	
156-60-5	trans-1,2-Dichloroethene	2.2	0.019	0.16	0.56	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054	0.021	0.21	0.010	0.0039	0.04	1	*
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
01/31/17

General Notes and Qualifiers:

--; Information not available or not applicable.
 ND; Less than the indicated limit of detection (LOD)
 RL; Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



ANALYTICAL RESULTS

Date: 24-Jan-17

Client: TETRA TECH
 Project: GRAND RAPIDS EMERGENCY RESPONSE

Work Order No: 17010564

Sample Identification GRPCE-48-OA-
 Lab Number: 008A
 Sample Type: Air, Can
 Test Method: EPA Method TO-15A
 Initial Pressure: -2.07 psig
 Final Pressure: -2.07 psig
 Canister ID: 14142

Date Sampled: 1/17/2017
 Date Received: 1/18/2017
 Analysis Date: 1/20/2017
 Analyst: DRS

CAS #	Analyte	Results (ug/m ³)	MDL (ug/m ³)	RL (ug/m ³)	Results (ppbV)	MDL (ppbV)	RL (ppbV)	DF	Qual
156-59-2	cis-1,2-Dichloroethene	ND	0.024	0.16	ND	0.0061	0.04	1	
127-18-4	Tetrachloroethene	0.14 J	0.036	0.27	0.020 J	0.0053	0.04	1	✓
156-60-5	trans-1,2-Dichloroethene	ND	0.019	0.16	ND	0.0049	0.04	1	
79-01-6	Trichloroethene	0.054 J	0.021	0.21	0.010 J	0.0039	0.04	1	✓
75-01-4	Vinyl Chloride	ND	0.022	0.10	ND	0.0088	0.04	1	

gaw
01/31/17

General Notes and Qualifiers:

–; Information not available or not applicable.
 ND: Less than the indicated limit of detection (LOD)
 RL: Report Limit
 J; Value is between the MDL and Reporting Limit, estimated r
 MDL; Method Detection Limit

B; Analyte detected in the associated Method Blank
 S; Spike Recovery outside accepted recovery limits
 R; RPD outside accepted recovery limits
 T; Tentatively Identified Compound (TIC)
 E; Value exceeds linear range of calibration curve



February 6, 2017

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Report
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1477**

Dear Ms. Nightingale:

Tetra Tech, Inc. (Tetra Tech) is submitting this Data Validation Report for 25 air samples (including a field duplicate) collected at the Grand Rapids VI ER site. The samples were collected from January 25 through 27, 2017 and were analyzed for volatile organic compounds by ALS Environmental. Tetra Tech received the data on February 3, 2017.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

If you have any questions regarding this Data Validation Report, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
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TDD File

ATTACHMENT 1

**DATA VALIDATION REPORT
ALS SDG P1700406**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1477	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 6 February 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> February 6, 2017	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1700406	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	25 air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-01-IA- [REDACTED] (Main)/GRPCE-01-IA- [REDACTED] (Main)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
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Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
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Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
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Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.37x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.39x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.43x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.43x: VOCs for GRPCE-02-SS- [REDACTED]
	1.44x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.45x: VOCs except tetrachloroethene for GRPCE-01-SS- [REDACTED]
	1.45x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.47x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.49x: VOCs except tetrachloroethene for GRPCE-03-SS- [REDACTED]
	1.49x: VOCs for GRPCE-01-SS- [REDACTED]
	1.50x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.51x: VOCs for GRPCE-01-IA- [REDACTED] (Basement), GRPCE-01-IA- [REDACTED] (Basement), and GRPCE-01-IA- [REDACTED] (Main)
	1.52x: VOCs for GRPCE-01-IA- [REDACTED] (Basement) and GRPCE-03-SS- [REDACTED]
	1.53x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.54x: VOCs for GRPCE-01-IA- [REDACTED] (Main), GRPCE-01-IA- [REDACTED] (Main) DP, and GRPCE-01-IA- [REDACTED] (Main)
	1.55x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.57x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.58x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.72x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	2.40x: VOCs for GRPCE-OA- [REDACTED]
	7.20x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	7.25x: tetrachloroethene for GRPCE-01-SS- [REDACTED]
	7.45x: tetrachloroethene for GRPCE-03-SS- [REDACTED]
	7.85x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	14.3x: tetrachloroethene for GRPCE-02-SS- [REDACTED]



**DATA VALIDATION CHECKLIST – STAGE 4
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Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700406

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.21		ppbV	0.016	0.022	0.21	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	1.4		ug/m3	0.11	0.15	1.4	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.1		ppbV	0.016	0.023	1.1	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.035	0.039	0.039	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	7.7		ug/m3	0.11	0.15	7.7	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.023	U	ppbV	0.017	0.023	0.023	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.16	U	ug/m3	0.11	0.16	0.16	U
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.022	U	ppbV	0.016	0.022	0.022	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U

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Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.15	U	ug/m3	0.11	0.15	0.15	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.023	U	ppbV	0.016	0.023	0.023	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.035	0.039	0.039	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.073		ppbV	0.026	0.029	0.073	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.15	U	ug/m3	0.11	0.15	0.15	U
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.39		ug/m3	0.14	0.15	0.39	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	2.3		ppbV	0.016	0.022	2.3	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.057	0.059	0.059	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	15		ug/m3	0.11	0.15	15	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.13		ppbV	0.015	0.021	0.13	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.033	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U

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Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.89		ug/m3	0.1	0.15	0.89	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.043	U	ppbV	0.04	0.043	0.043	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.063		ppbV	0.018	0.025	0.063	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.043	U	ppbV	0.039	0.043	0.043	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.032	U	ppbV	0.028	0.032	0.032	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.067	U	ppbV	0.064	0.067	0.067	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.43		ug/m3	0.12	0.17	0.43	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.037		ppbV	0.016	0.022	0.037	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.25		ug/m3	0.11	0.15	0.25	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main) DP	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main) DP	Tetrachloroethene	0.038		ppbV	0.016	0.023	0.038	
GRPCE-01-IA-	(Main) DP	trans-1,2-Dichloroethene	0.039	U	ppbV	0.035	0.039	0.039	U
GRPCE-01-IA-	(Main) DP	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-01-IA-	(Main) DP	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-01-IA-	(Main) DP	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main) DP	Tetrachloroethene	0.26		ug/m3	0.11	0.15	0.26	
GRPCE-01-IA-	(Main) DP	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main) DP	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
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Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main) DP	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.54		ppbV	0.016	0.022	0.54	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	1.8		ppbV	0.034	0.037	1.8	
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	3.7		ug/m3	0.11	0.15	3.7	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	7.2		ug/m3	0.13	0.15	7.2	
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.23		ppbV	0.016	0.023	0.23	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	1.4		ppbV	0.035	0.039	1.4	
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.5		ug/m3	0.11	0.15	1.5	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	5.6		ug/m3	0.14	0.15	5.6	
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.1		ppbV	0.015	0.021	0.1	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.026	U	ppbV	0.023	0.026	0.026	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.054	U	ppbV	0.052	0.054	0.054	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.69		ug/m3	0.1	0.14	0.69	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.035	U	ppbV	0.032	0.035	0.035	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.078		ppbV	0.015	0.02	0.078	

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700406

Samp_No		Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.035	U	ppbV	0.031	0.035	0.035	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.026	U	ppbV	0.023	0.026	0.026	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.054	U	ppbV	0.051	0.054	0.054	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.53		ug/m3	0.099	0.14	0.53	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.11		ppbV	0.016	0.022	0.11	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.74		ug/m3	0.11	0.15	0.74	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.066		ppbV	0.016	0.023	0.066	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.25		ppbV	0.026	0.029	0.25	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.45		ug/m3	0.11	0.16	0.45	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	1.3		ug/m3	0.14	0.16	1.3	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-SS-		cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-SS-		Tetrachloroethene	1.3		ppbV	0.016	0.022	1.3	
GRPCE-01-SS-		trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-01-SS-		Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-SS-		Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700406

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-SS-	Tetrachloroethene	9.1		ug/m3	0.11	0.15	9.1	
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-SS-	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-SS-	Tetrachloroethene	67	D	ppbV	0.077	0.11	67	
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.043		ppbV	0.033	0.037	0.043	
GRPCE-01-SS-	Trichloroethene (TCE)	0.53		ppbV	0.024	0.027	0.53	
GRPCE-01-SS-	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-SS-	Tetrachloroethene	460	D	ug/m3	0.52	0.73	460	
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.17		ug/m3	0.13	0.15	0.17	
GRPCE-01-SS-	Trichloroethene (TCE)	2.8		ug/m3	0.13	0.15	2.8	
GRPCE-01-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Tetrachloroethene	3.7		ppbV	0.015	0.021	3.7	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-SS-	Vinyl Chloride	0.056	U	ppbV	0.053	0.056	0.056	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Tetrachloroethene	25		ug/m3	0.1	0.14	25	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Vinyl Chloride	0.14	U	ug/m3	0.14	0.14	0.14	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-02-SS-	Tetrachloroethene	63	D	ppbV	0.083	0.12	63	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-02-SS-	Vinyl Chloride	0.061	U	ppbV	0.058	0.061	0.061	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-02-SS-	Tetrachloroethene	420	D	ug/m3	0.57	0.79	420	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700406

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-02-SS-	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Tetrachloroethene	43	D	ppbV	0.15	0.21	43	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-SS-	Vinyl Chloride	0.056	U	ppbV	0.054	0.056	0.056	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Tetrachloroethene	290	D	ug/m3	1	1.4	290	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Vinyl Chloride	0.14	U	ug/m3	0.14	0.14	0.14	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Tetrachloroethene	50	D	ppbV	0.15	0.21	50	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.42		ppbV	0.024	0.027	0.42	
GRPCE-02-SS-	Vinyl Chloride	0.056	U	ppbV	0.053	0.056	0.056	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Tetrachloroethene	340	D	ug/m3	1	1.4	340	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-	Trichloroethene (TCE)	2.3		ug/m3	0.13	0.14	2.3	
GRPCE-02-SS-	Vinyl Chloride	0.14	U	ug/m3	0.14	0.14	0.14	U
GRPCE-03-SS-	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-03-SS-	Tetrachloroethene	56	D	ppbV	0.079	0.11	56	
GRPCE-03-SS-	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-03-SS-	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-03-SS-	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-03-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	Tetrachloroethene	380	D	ug/m3	0.54	0.75	380	
GRPCE-03-SS-	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-03-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700406

Samp_No	Analyte	Result	Lab_Qualifier	Result_Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-03-SS-	Tetrachloroethene	0.022	U	ppbV	0.016	0.022	0.022	U
GRPCE-03-SS-	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-03-SS-	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-03-SS-	Vinyl Chloride	0.059	U	ppbV	0.057	0.059	0.059	U
GRPCE-03-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	Tetrachloroethene	0.15	U	ug/m3	0.11	0.15	0.15	U
GRPCE-03-SS-	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-03-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-OA-	cis-1,2-Dichloroethene	0.061	U	ppbV	0.056	0.061	0.061	U
GRPCE-OA-	Tetrachloroethene	0.035	U	ppbV	0.025	0.035	0.035	U
GRPCE-OA-	trans-1,2-Dichloroethene	0.061	U	ppbV	0.055	0.061	0.061	U
GRPCE-OA-	Trichloroethene (TCE)	0.045	U	ppbV	0.04	0.045	0.045	U
GRPCE-OA-	Vinyl Chloride	0.094	U	ppbV	0.089	0.094	0.094	U
GRPCE-OA-	cis-1,2-Dichloroethene	0.24	U	ug/m3	0.22	0.24	0.24	U
GRPCE-OA-	Tetrachloroethene	0.24	U	ug/m3	0.17	0.24	0.24	U
GRPCE-OA-	trans-1,2-Dichloroethene	0.24	U	ug/m3	0.22	0.24	0.24	U
GRPCE-OA-	Trichloroethene (TCE)	0.24	U	ug/m3	0.21	0.24	0.24	U
GRPCE-OA-	Vinyl Chloride	0.24	U	ug/m3	0.23	0.24	0.24	U



February 20, 2017

Betsy Nightingale
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
9311 Groh Road
Grosse Ile, MI 48138-1697

**Subject: Data Validation Reports
Grand Rapids VI ER
EPA Contract No. EP-S5-13-01
Technical Direction Document No. S05-0001-1605-010
Document Tracking No. 1498**

Dear Ms. Nightingale:

Tetra Tech, Inc. (Tetra Tech) is submitting these Data Validation Reports for 54 air samples (including four field duplicates) collected at the Grand Rapids VI ER site. The samples were collected from February 1 through 3, 2017 and were analyzed for volatile organic compounds by ALS Environmental Laboratories. Tetra Tech received the last of the data on February 15, 2017.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

No rejection of results was required for these data sets. The data is usable as qualified based on the findings of this validation effort.

If you have any questions regarding these Data Validation Reports, please call me at (662) 681-5727.

Sincerely,

A handwritten signature in black ink that reads 'Jessica A. Vickers'.

Jessica A. Vickers
START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager
Michael Browning, Tetra Tech Project Manager
TDD File

ATTACHMENT 1

**DATA VALIDATION REPORTS
ALS ENVIRONMENTAL REPORT NOS. P1700530, P1700531, AND
P1700532**

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1498A		
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> February 16, 2017	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 20 February 2017
Laboratory Report No.	P1700530	Laboratory	ALS Laboratories/Simi Valley, CA
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	19 air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-02-SS- [REDACTED] GRPCE-02-SS- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
N	P170210: The recovery for vinyl chloride was above the acceptance limit; however, no qualifications were applied because the associated results were non-detect.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.43x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.44x: VOCs for GRPCE-02-SS- [REDACTED]
	1.45x: VOCs for GRPCE-02-IA- [REDACTED] (Basement) and GRPCE-07-IA- [REDACTED] (Basement)
	1.48x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.50x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	1.51x: VOCs for GRPCE-01-IA- [REDACTED] (Basement)
	1.52x: VOCs for GRPCE-02-IA- [REDACTED] (Main)
	1.53x: VOCs for GRPCE-02-IA- [REDACTED] (Basement Hall)
	1.58x: VOCs for GRPCE-07-IA- [REDACTED] (Main) and GRPCE-02-IA- [REDACTED] (Main)
	1.62x: VOCs for GRPCE-01-IA- [REDACTED] (Main)
	1.67x: VOCs for GRPCE-01-IA- [REDACTED] (Main) and GRPCE-01-IA- [REDACTED] (Main)
	3.525x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	3.60x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED] DP
	7.45x: VOCs except tetrachloroethene for GRPCE-01-SS- [REDACTED]
	15.0x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	19.5x: VOCs except tetrachloroethene for GRPCE-01-SS- [REDACTED]
	28.2x: tetrachloroethene for GRPCE-02-SS- [REDACTED]
	28.8x: tetrachloroethene for GRPCE-02-SS- [REDACTED] DP
	29.0x: VOCs except tetrachloroethene for GRPCE-02-SS- [REDACTED]
	29.8x: tetrachloroethene for GRPCE-01-SS- [REDACTED]
96.7x: tetrachloroethene for GRPCE-02-SS- [REDACTED]	
97.3x: tetrachloroethene for GRPCE-01-SS- [REDACTED]	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.99		ppbV	0.015	0.021	0.99	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.056	U	ppbV	0.053	0.056	0.056	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	6.7		ug/m3	0.1	0.14	6.7	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.14	0.14	0.14	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.041	U	ppbV	0.038	0.041	0.041	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.8		ppbV	0.017	0.024	0.8	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.041	U	ppbV	0.037	0.041	0.041	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.14		ppbV	0.027	0.03	0.14	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.063	U	ppbV	0.06	0.063	0.063	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	5.5		ug/m3	0.12	0.16	5.5	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.76		ug/m3	0.14	0.16	0.76	
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.53		ppbV	0.016	0.022	0.53	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	3.6		ug/m3	0.11	0.15	3.6	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.042	U	ppbV	0.039	0.042	0.042	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.45		ppbV	0.018	0.025	0.45	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.042	U	ppbV	0.038	0.042	0.042	U

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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.031	U	ppbV	0.028	0.031	0.031	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.065	U	ppbV	0.062	0.065	0.065	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	3		ug/m3	0.12	0.17	3	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.39		ppbV	0.016	0.022	0.39	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	2.7		ug/m3	0.11	0.15	2.7	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.042	U	ppbV	0.039	0.042	0.042	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.22		ppbV	0.018	0.025	0.22	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.042	U	ppbV	0.038	0.042	0.042	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.031	U	ppbV	0.028	0.031	0.031	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.065	U	ppbV	0.062	0.065	0.065	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.5		ug/m3	0.12	0.17	1.5	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-SS-		cis-1,2-Dichloroethene	1.8		ppbV	0.45	0.49	1.8	
GRPCE-01-SS-		Tetrachloroethene	1400	D	ppbV	1	1.4	1400	
GRPCE-01-SS-		trans-1,2-Dichloroethene	0.58		ppbV	0.45	0.49	0.58	
GRPCE-01-SS-		Trichloroethene (TCE)	32		ppbV	0.32	0.36	32	
GRPCE-01-SS-		Vinyl Chloride	0.76	U	ppbV	0.72	0.76	0.76	U
GRPCE-01-SS-		cis-1,2-Dichloroethene	7.3		ug/m3	1.8	1.9	7.3	

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Samp_No	Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-SS-	Tetrachloroethene	9700	D	ug/m3	7	9.7	9700	
GRPCE-01-SS-	trans-1,2-Dichloroethene	2.3		ug/m3	1.8	1.9	2.3	
GRPCE-01-SS-	Trichloroethene (TCE)	170		ug/m3	1.7	1.9	170	
GRPCE-01-SS-	Vinyl Chloride	1.9	U	ug/m3	1.8	1.9	1.9	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.19	U	ppbV	0.17	0.19	0.19	U
GRPCE-01-SS-	Tetrachloroethene	170	D	ppbV	0.32	0.44	170	
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.19	U	ppbV	0.17	0.19	0.19	U
GRPCE-01-SS-	Trichloroethene (TCE)	0.14	U	ppbV	0.12	0.14	0.14	U
GRPCE-01-SS-	Vinyl Chloride	0.29	U	ppbV	0.28	0.29	0.29	U
GRPCE-01-SS-	cis-1,2-Dichloroethene	0.75	U	ug/m3	0.69	0.75	0.75	U
GRPCE-01-SS-	Tetrachloroethene	1100	D	ug/m3	2.1	3	1100	
GRPCE-01-SS-	trans-1,2-Dichloroethene	0.75	U	ug/m3	0.68	0.75	0.75	U
GRPCE-01-SS-	Trichloroethene (TCE)	0.75	U	ug/m3	0.66	0.75	0.75	U
GRPCE-01-SS-	Vinyl Chloride	0.75	U	ug/m3	0.71	0.75	0.75	U
GRPCE-02-IA-	(Basement Hall) cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-02-IA-	(Basement Hall) Tetrachloroethene	0.79		ppbV	0.016	0.023	0.79	
GRPCE-02-IA-	(Basement Hall) trans-1,2-Dichloroethene	0.039	U	ppbV	0.035	0.039	0.039	U
GRPCE-02-IA-	(Basement Hall) Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-02-IA-	(Basement Hall) Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-02-IA-	(Basement Hall) cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Basement Hall) Tetrachloroethene	5.4		ug/m3	0.11	0.15	5.4	
GRPCE-02-IA-	(Basement Hall) trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Basement Hall) Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Basement Hall) Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-02-IA-	(Main) cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-02-IA-	(Main) Tetrachloroethene	0.59		ppbV	0.017	0.023	0.59	
GRPCE-02-IA-	(Main) trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-02-IA-	(Main) Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-02-IA-	(Main) Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-02-IA-	(Main) cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-02-IA-	(Main) Tetrachloroethene	4		ug/m3	0.11	0.16	4	
GRPCE-02-IA-	(Main) trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-02-IA-	(Main) Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U

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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	0.021	U	ppbV	0.015	0.021	0.021	U
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.033	0.037	0.037	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	0.15	U	ug/m3	0.1	0.15	0.15	U
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	0.59		ppbV	0.016	0.022	0.59	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.057	0.059	0.059	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	4		ug/m3	0.11	0.15	4	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-		Tetrachloroethene	0.87		ppbV	0.015	0.021	0.87	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.036	U	ppbV	0.033	0.036	0.036	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-02-SS-		Vinyl Chloride	0.056	U	ppbV	0.054	0.056	0.056	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-		Tetrachloroethene	5.9		ug/m3	0.1	0.14	5.9	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-02-SS-		Vinyl Chloride	0.14	U	ug/m3	0.14	0.14	0.14	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.73	U	ppbV	0.67	0.73	0.73	U
GRPCE-02-SS-		Tetrachloroethene	770	D	ppbV	1	1.4	770	

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Samp_No	Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.73	U	ppbV	0.67	0.73	0.73	U
GRPCE-02-SS-	Trichloroethene (TCE)	3.5		ppbV	0.48	0.54	3.5	
GRPCE-02-SS-	Vinyl Chloride	1.1	U	ppbV	1.1	1.1	1.1	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	2.9	U	ug/m3	2.7	2.9	2.9	U
GRPCE-02-SS-	Tetrachloroethene	5200	D	ug/m3	7	9.7	5200	
GRPCE-02-SS-	trans-1,2-Dichloroethene	2.9	U	ug/m3	2.6	2.9	2.9	U
GRPCE-02-SS-	Trichloroethene (TCE)	19		ug/m3	2.6	2.9	19	
GRPCE-02-SS-	Vinyl Chloride	2.9	U	ug/m3	2.8	2.9	2.9	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-02-SS-	Tetrachloroethene	130	D	ppbV	0.16	0.22	130	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.95		ppbV	0.025	0.028	0.95	
GRPCE-02-SS-	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	Tetrachloroethene	880	D	ug/m3	1.1	1.5	880	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	Trichloroethene (TCE)	5.1		ug/m3	0.13	0.15	5.1	
GRPCE-02-SS-	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.089	U	ppbV	0.082	0.089	0.089	U
GRPCE-02-SS-	Tetrachloroethene	190	D	ppbV	0.3	0.42	190	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.089	U	ppbV	0.081	0.089	0.089	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.077		ppbV	0.058	0.066	0.077	
GRPCE-02-SS-	Vinyl Chloride	0.14	U	ppbV	0.13	0.14	0.14	U
GRPCE-02-SS-	cis-1,2-Dichloroethene	0.35	U	ug/m3	0.32	0.35	0.35	U
GRPCE-02-SS-	Tetrachloroethene	1300	D	ug/m3	2	2.8	1300	
GRPCE-02-SS-	trans-1,2-Dichloroethene	0.35	U	ug/m3	0.32	0.35	0.35	U
GRPCE-02-SS-	Trichloroethene (TCE)	0.42		ug/m3	0.31	0.35	0.42	
GRPCE-02-SS-	Vinyl Chloride	0.35	U	ug/m3	0.33	0.35	0.35	U
GRPCE-02-SS-	DP cis-1,2-Dichloroethene	0.091	U	ppbV	0.084	0.091	0.091	U
GRPCE-02-SS-	DP Tetrachloroethene	190	D	ppbV	0.31	0.42	190	
GRPCE-02-SS-	DP trans-1,2-Dichloroethene	0.091	U	ppbV	0.083	0.091	0.091	U
GRPCE-02-SS-	DP Trichloroethene (TCE)	0.068		ppbV	0.06	0.067	0.068	
GRPCE-02-SS-	DP Vinyl Chloride	0.14	U	ppbV	0.13	0.14	0.14	U

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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-	DP	cis-1,2-Dichloroethene	0.36	U	ug/m3	0.33	0.36	0.36	U
GRPCE-02-SS-	DP	Tetrachloroethene	1300	D	ug/m3	2.1	2.9	1300	
GRPCE-02-SS-	DP	trans-1,2-Dichloroethene	0.36	U	ug/m3	0.33	0.36	0.36	U
GRPCE-02-SS-	DP	Trichloroethene (TCE)	0.37		ug/m3	0.32	0.36	0.37	
GRPCE-02-SS-	DP	Vinyl Chloride	0.36	U	ug/m3	0.34	0.36	0.36	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	0.54		ppbV	0.015	0.021	0.54	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.033	0.037	0.037	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	3.6		ug/m3	0.1	0.15	3.6	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.037	0.04	0.04	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	0.68		ppbV	0.017	0.023	0.68	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.036	0.04	0.04	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.026	0.029	0.029	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.062	U	ppbV	0.059	0.062	0.062	U
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.15	0.16	0.16	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	4.6		ug/m3	0.11	0.16	4.6	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.14	0.16	0.16	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.15	0.16	0.16	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1498B	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 20 February 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> February 16, 2017	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1700531		
Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15		
Samples and Matrix	19 air samples (including a field duplicate)		
Field Duplicate Pairs	GRPCE-01-IA- [REDACTED] (Main)/GRPCE-01-IA- [REDACTED] (Main)-DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection or qualification of results was required for this data set. The data is usable as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.37x: VOCs for GRPCE-07-IA-[REDACTED] (Basement) 1.40x: VOCs for GRPCE-01-IA-[REDACTED] (Basement) 1.43x: VOCs for GRPCE-01-IA-[REDACTED] (Basement) and GRPCE-01-IA-[REDACTED] (Main), 1.44x: VOCs for GRPCE-02-IA-[REDACTED] (Basement), GRPCE-02-IA-[REDACTED] (Basement), and GRPCE-07-IA-[REDACTED] (Basement) 1.48x: VOCs for GRPCE-01-IA-[REDACTED] (Main) 1.49x: VOCs for GRPCE-01-IA-[REDACTED] (Main) 1.51x: VOCs for GRPCE-02-IA-[REDACTED] (Main) 1.52x: VOCs for GRPCE-01-IA-[REDACTED] (Basement) 1.53x: VOCs for GRPCE-01-IA-[REDACTED] (Main)-DP 1.54x: VOCs for GRPCE-02-IA-[REDACTED] (Main) 1.56x: VOCs for GRPCE-07-IA-[REDACTED] (Main) 1.60x: VOCs for GRPCE-07-IA-[REDACTED] (Main) 3.70x: VOCs for GRPCE-02-SS-[REDACTED] 9.93x: VOCs for GRPCE-02-SS-[REDACTED] 26.4x: VOCs for GRPCE-02-SS-[REDACTED] 28.4x: VOCs except tetrachloroethene for GRPCE-02-SS-[REDACTED] 94.6x: tetrachloroethene for GRPCE-02-SS-[REDACTED]

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700531

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-		(Basement)	cis-1,2-Dichloroethene	0.036 U	ppbV	0.0033	0.036	0.036 U	
GRPCE-01-IA-		(Basement)	Tetrachloroethene	0.39	ppbV	0.0017	0.021	0.39	
GRPCE-01-IA-		(Basement)	trans-1,2-Dichloroethene	0.036 U	ppbV	0.0026	0.036	0.036 U	
GRPCE-01-IA-		(Basement)	Trichloroethene (TCE)	0.027 U	ppbV	0.0023	0.027	0.027 U	
GRPCE-01-IA-		(Basement)	Vinyl Chloride	0.056 U	ppbV	0.0043	0.056	0.056 U	
GRPCE-01-IA-		(Basement)	cis-1,2-Dichloroethene	0.14 U	ug/m3	0.013	0.14	0.14 U	
GRPCE-01-IA-		(Basement)	Tetrachloroethene	2.7	ug/m3	0.012	0.14	2.7	
GRPCE-01-IA-		(Basement)	trans-1,2-Dichloroethene	0.14 U	ug/m3	0.01	0.14	0.14 U	
GRPCE-01-IA-		(Basement)	Trichloroethene (TCE)	0.14 U	ug/m3	0.012	0.14	0.14 U	
GRPCE-01-IA-		(Basement)	Vinyl Chloride	0.14 U	ug/m3	0.011	0.14	0.14 U	
GRPCE-01-IA-		(Main)	cis-1,2-Dichloroethene	0.036 U	ppbV	0.0033	0.036	0.036 U	
GRPCE-01-IA-		(Main)	Tetrachloroethene	0.36	ppbV	0.0017	0.021	0.36	
GRPCE-01-IA-		(Main)	trans-1,2-Dichloroethene	0.036 U	ppbV	0.0026	0.036	0.036 U	
GRPCE-01-IA-		(Main)	Trichloroethene (TCE)	0.027 U	ppbV	0.0023	0.027	0.027 U	
GRPCE-01-IA-		(Main)	Vinyl Chloride	0.056 U	ppbV	0.0043	0.056	0.056 U	
GRPCE-01-IA-		(Main)	cis-1,2-Dichloroethene	0.14 U	ug/m3	0.013	0.14	0.14 U	
GRPCE-01-IA-		(Main)	Tetrachloroethene	2.5	ug/m3	0.012	0.14	2.5	
GRPCE-01-IA-		(Main)	trans-1,2-Dichloroethene	0.14 U	ug/m3	0.01	0.14	0.14 U	
GRPCE-01-IA-		(Main)	Trichloroethene (TCE)	0.14 U	ug/m3	0.012	0.14	0.14 U	
GRPCE-01-IA-		(Main)	Vinyl Chloride	0.14 U	ug/m3	0.011	0.14	0.14 U	
GRPCE-01-IA-		(Main)-Dp	cis-1,2-Dichloroethene	0.039 U	ppbV	0.0036	0.039	0.039 U	
GRPCE-01-IA-		(Main)-Dp	Tetrachloroethene	0.37	ppbV	0.0019	0.023	0.37	
GRPCE-01-IA-		(Main)-Dp	trans-1,2-Dichloroethene	0.039 U	ppbV	0.0028	0.039	0.039 U	
GRPCE-01-IA-		(Main)-Dp	Trichloroethene (TCE)	0.028 U	ppbV	0.0024	0.028	0.028 U	
GRPCE-01-IA-		(Main)-Dp	Vinyl Chloride	0.06 U	ppbV	0.0046	0.06	0.06 U	
GRPCE-01-IA-		(Main)-Dp	cis-1,2-Dichloroethene	0.15 U	ug/m3	0.014	0.15	0.15 U	
GRPCE-01-IA-		(Main)-Dp	Tetrachloroethene	2.5	ug/m3	0.013	0.15	2.5	
GRPCE-01-IA-		(Main)-Dp	trans-1,2-Dichloroethene	0.15 U	ug/m3	0.011	0.15	0.15 U	
GRPCE-01-IA-		(Main)-Dp	Trichloroethene (TCE)	0.15 U	ug/m3	0.013	0.15	0.15 U	
GRPCE-01-IA-		(Main)-Dp	Vinyl Chloride	0.15 U	ug/m3	0.012	0.15	0.15 U	
GRPCE-01-IA-		(Basement)	cis-1,2-Dichloroethene	0.035 U	ppbV	0.0032	0.035	0.035 U	
GRPCE-01-IA-		(Basement)	Tetrachloroethene	0.49	ppbV	0.0017	0.021	0.49	
GRPCE-01-IA-		(Basement)	trans-1,2-Dichloroethene	0.035 U	ppbV	0.0026	0.035	0.035 U	

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700531

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.026	U	ppbV	0.0022	0.026	0.026	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.055	U	ppbV	0.0042	0.055	0.055	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.013	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	3.3		ug/m3	0.011	0.14	3.3	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.01	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.012	0.14	0.14	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.0035	0.038	0.038	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.46		ppbV	0.0018	0.022	0.46	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.0027	0.038	0.038	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.0024	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.058	U	ppbV	0.0044	0.058	0.058	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.014	0.15	0.15	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	3.1		ug/m3	0.012	0.15	3.1	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.013	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.0035	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.31		ppbV	0.0018	0.022	0.31	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.0028	0.038	0.038	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.0024	0.028	0.028	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.059	U	ppbV	0.0045	0.059	0.059	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.014	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	2.1		ug/m3	0.012	0.15	2.1	
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.013	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.012	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.0034	0.037	0.037	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.28		ppbV	0.0018	0.022	0.28	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.0027	0.037	0.037	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.0023	0.028	0.028	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.058	U	ppbV	0.0044	0.058	0.058	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.014	0.15	0.15	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700531

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Main)	Tetrachloroethene	1.9		ug/m3	0.012	0.15	1.9	
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.013	0.15	0.15	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.036	U	ppbV	0.0033	0.036	0.036	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	0.92		ppbV	0.0017	0.021	0.92	
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.036	U	ppbV	0.0027	0.036	0.036	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.0023	0.027	0.027	U
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.056	U	ppbV	0.0043	0.056	0.056	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.013	0.14	0.14	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	6.3		ug/m3	0.012	0.14	6.3	
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.012	0.14	0.14	U
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.0035	0.038	0.038	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	0.52		ppbV	0.0018	0.022	0.52	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.0028	0.038	0.038	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.0024	0.028	0.028	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.059	U	ppbV	0.0045	0.059	0.059	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.014	0.15	0.15	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	3.6		ug/m3	0.012	0.15	3.6	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.013	0.15	0.15	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.036	U	ppbV	0.0033	0.036	0.036	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	1.1		ppbV	0.0017	0.021	1.1	
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.036	U	ppbV	0.0027	0.036	0.036	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.0023	0.027	0.027	U
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.056	U	ppbV	0.0043	0.056	0.056	U
GRPCE-02-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.013	0.14	0.14	U
GRPCE-02-IA-	(Basement)	Tetrachloroethene	7.4		ug/m3	0.012	0.14	7.4	
GRPCE-02-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-02-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.012	0.14	0.14	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700531

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.0036	0.039	0.039	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	0.79		ppbV	0.0019	0.023	0.79	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.0028	0.039	0.039	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.0024	0.029	0.029	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.06	U	ppbV	0.0046	0.06	0.06	U
GRPCE-02-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.014	0.15	0.15	U
GRPCE-02-IA-	(Main)	Tetrachloroethene	5.3		ug/m3	0.013	0.15	5.3	
GRPCE-02-IA-	(Main)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.011	0.15	0.15	U
GRPCE-02-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.013	0.15	0.15	U
GRPCE-02-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.012	0.15	0.15	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.72	U	ppbV	0.066	0.72	0.72	U
GRPCE-02-SS-		Tetrachloroethene	270	D	ppbV	0.11	1.4	270	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.72	U	ppbV	0.052	0.72	0.72	U
GRPCE-02-SS-		Trichloroethene (TCE)	7.4		ppbV	0.045	0.53	7.4	
GRPCE-02-SS-		Vinyl Chloride	1.1	U	ppbV	0.084	1.1	1.1	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	2.8	U	ug/m3	0.26	2.8	2.8	U
GRPCE-02-SS-		Tetrachloroethene	1900	D	ug/m3	0.78	9.5	1900	
GRPCE-02-SS-		trans-1,2-Dichloroethene	2.8	U	ug/m3	0.21	2.8	2.8	U
GRPCE-02-SS-		Trichloroethene (TCE)	40		ug/m3	0.24	2.8	40	
GRPCE-02-SS-		Vinyl Chloride	2.8	U	ug/m3	0.22	2.8	2.8	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.67	U	ppbV	0.061	0.67	0.67	U
GRPCE-02-SS-		Tetrachloroethene	130		ppbV	0.032	0.39	130	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.67	U	ppbV	0.049	0.67	0.67	U
GRPCE-02-SS-		Trichloroethene (TCE)	1.6		ppbV	0.042	0.49	1.6	
GRPCE-02-SS-		Vinyl Chloride	1	U	ppbV	0.079	1	1	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	2.6	U	ug/m3	0.24	2.6	2.6	U
GRPCE-02-SS-		Tetrachloroethene	860		ug/m3	0.22	2.6	860	
GRPCE-02-SS-		trans-1,2-Dichloroethene	2.6	U	ug/m3	0.19	2.6	2.6	U
GRPCE-02-SS-		Trichloroethene (TCE)	8.8		ug/m3	0.22	2.6	8.8	
GRPCE-02-SS-		Vinyl Chloride	2.6	U	ug/m3	0.2	2.6	2.6	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.25	U	ppbV	0.023	0.25	0.25	U
GRPCE-02-SS-		Tetrachloroethene	64		ppbV	0.012	0.15	64	

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700531

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.25	U	ppbV	0.018	0.25	0.25	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.18	U	ppbV	0.016	0.18	0.18	U
GRPCE-02-SS-		Vinyl Chloride	0.39	U	ppbV	0.03	0.39	0.39	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.99	U	ug/m3	0.091	0.99	0.99	U
GRPCE-02-SS-		Tetrachloroethene	430		ug/m3	0.081	0.99	430	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.99	U	ug/m3	0.073	0.99	0.99	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.99	U	ug/m3	0.084	0.99	0.99	U
GRPCE-02-SS-		Vinyl Chloride	0.99	U	ug/m3	0.075	0.99	0.99	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.093	U	ppbV	0.0086	0.093	0.093	U
GRPCE-02-SS-		Tetrachloroethene	23		ppbV	0.0045	0.055	23	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.093	U	ppbV	0.0068	0.093	0.093	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.069	U	ppbV	0.0059	0.069	0.069	U
GRPCE-02-SS-		Vinyl Chloride	0.14	U	ppbV	0.011	0.14	0.14	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.37	U	ug/m3	0.034	0.37	0.37	U
GRPCE-02-SS-		Tetrachloroethene	160		ug/m3	0.03	0.37	160	
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.37	U	ug/m3	0.027	0.37	0.37	U
GRPCE-02-SS-		Trichloroethene (TCE)	0.37	U	ug/m3	0.031	0.37	0.37	U
GRPCE-02-SS-		Vinyl Chloride	0.37	U	ug/m3	0.028	0.37	0.37	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.035	U	ppbV	0.0032	0.035	0.035	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	0.47		ppbV	0.0017	0.02	0.47	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.035	U	ppbV	0.0025	0.035	0.035	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.026	U	ppbV	0.0022	0.026	0.026	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.054	U	ppbV	0.0041	0.054	0.054	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.013	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	3.2		ug/m3	0.011	0.14	3.2	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.01	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.012	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.01	0.14	0.14	U
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.0036	0.039	0.039	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	0.42		ppbV	0.0019	0.023	0.42	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.039	U	ppbV	0.0029	0.039	0.039	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.029	U	ppbV	0.0025	0.029	0.029	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.061	U	ppbV	0.0046	0.061	0.061	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.014	0.16	0.16	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	2.9		ug/m3	0.013	0.16	2.9	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.011	0.16	0.16	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.013	0.16	0.16	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.012	0.16	0.16	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.036	U	ppbV	0.0033	0.036	0.036	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	0.39		ppbV	0.0017	0.021	0.39	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.036	U	ppbV	0.0027	0.036	0.036	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.0023	0.027	0.027	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.056	U	ppbV	0.0043	0.056	0.056	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.013	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	2.7		ug/m3	0.012	0.14	2.7	
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.14	U	ug/m3	0.012	0.14	0.14	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.14	U	ug/m3	0.011	0.14	0.14	U
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.04	U	ppbV	0.0037	0.04	0.04	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	0.38		ppbV	0.0019	0.024	0.38	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.04	U	ppbV	0.0029	0.04	0.04	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.03	U	ppbV	0.0025	0.03	0.03	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.063	U	ppbV	0.0048	0.063	0.063	U
GRPCE-07-IA-	(Main)	cis-1,2-Dichloroethene	0.16	U	ug/m3	0.015	0.16	0.16	U
GRPCE-07-IA-	(Main)	Tetrachloroethene	2.6		ug/m3	0.013	0.16	2.6	
GRPCE-07-IA-	(Main)	trans-1,2-Dichloroethene	0.16	U	ug/m3	0.012	0.16	0.16	U
GRPCE-07-IA-	(Main)	Trichloroethene (TCE)	0.16	U	ug/m3	0.014	0.16	0.16	U
GRPCE-07-IA-	(Main)	Vinyl Chloride	0.16	U	ug/m3	0.012	0.16	0.16	U

**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Site Name	Grand Rapids VI ER	TDD No.	S05-0001-1605-010
Document Tracking No.	1498C	Technical Reviewer (signature and date)	<i>Harry N. Ellis III</i> 20 February 2017
Data Reviewer (signature and date)	<i>Jessica A. Vickers</i> February 16, 2017	Laboratory	ALS Laboratories/Simi Valley, CA
Laboratory Report No.	P1700532	Analyses	Volatile organic compounds (VOCs) by EPA Method TO-15
Samples and Matrix	16 air samples (including two field duplicates)		
Field Duplicate Pairs	GRPCE-07-IA- [REDACTED] (Basement)/GRPCE-07-IA- [REDACTED] (Basement)-DP and GRPCE-45-IA- [REDACTED] GRPCE-45-IA- [REDACTED] DP		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (August 2014).

OVERALL EVALUATION

No rejection of results was required for this data set. The data is usable as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	Sample GRPCE-02-SS- [REDACTED] DP was erroneously identified on the chain-of-custody documentation as a field duplicate. This is the only sample submitted for this location; therefore, the “-DP” was removed from the sample identifier in the attachment to this checklist.



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	The percent difference for tetrachloroethene exceeded the acceptance limit; therefore, all tetrachloroethene results were qualified as estimated (J).

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	1.27x: VOCs for GRPCE-03-IA- [REDACTED] (Basement) 1.36x: VOCs for GRPCE-03-IA- [REDACTED] (Main) and GRPCE-49-OA- [REDACTED] 1.46x: VOCs for GRPCE-01-IA- [REDACTED] (Basement) and GRPCE-45-IA- [REDACTED] 1.48x: VOCs for GRPCE-07-IA- [REDACTED] (Basement)-DP 1.49x: VOCs for GRPCE-07-IA- [REDACTED] (Basement) and GRPCE-45-IA- [REDACTED] 1.51x: VOCs for GRPCE-45-IA- [REDACTED] DP and GRPCE-46-IA- [REDACTED] (1) 1.53x: VOCs for GRPCE-45-IA- [REDACTED] (Main) and GRPCE-46-IA- [REDACTED] (2) 1.69x: VOCs for GRPCE-01-IA- [REDACTED] (Main) 1.95x: VOCs for GRPCE-45-IA- [REDACTED] (Basement) 18.9x: VOCs for GRPCE-02-SS- [REDACTED] DP 25.7x: VOCs for GRPCE-01-SS- [REDACTED]



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All results were either non-detect or above RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	



**DATA VALIDATION CHECKLIST – STAGE 4
EPA REGION 5 START CONTRACT**

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700532

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	0.72		ppbV	0.016	0.022	0.72	J
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-01-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Tetrachloroethene	4.9		ug/m3	0.11	0.15	4.9	J
GRPCE-01-IA-	(Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-01-IA-	(Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.043	U	ppbV	0.039	0.043	0.043	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	0.46		ppbV	0.018	0.025	0.46	J
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.043	U	ppbV	0.039	0.043	0.043	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.031	U	ppbV	0.028	0.031	0.031	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.066	U	ppbV	0.063	0.066	0.066	U
GRPCE-01-IA-	(Main)	cis-1,2-Dichloroethene	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-IA-	(Main)	Tetrachloroethene	3.1		ug/m3	0.12	0.17	3.1	J
GRPCE-01-IA-	(Main)	trans-1,2-Dichloroethene	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Trichloroethene (TCE)	0.17	U	ug/m3	0.15	0.17	0.17	U
GRPCE-01-IA-	(Main)	Vinyl Chloride	0.17	U	ug/m3	0.16	0.17	0.17	U
GRPCE-01-SS-		cis-1,2-Dichloroethene	0.65	U	ppbV	0.6	0.65	0.65	U
GRPCE-01-SS-		Tetrachloroethene	340		ppbV	0.27	0.38	340	J
GRPCE-01-SS-		trans-1,2-Dichloroethene	0.65	U	ppbV	0.59	0.65	0.65	U
GRPCE-01-SS-		Trichloroethene (TCE)	1.7		ppbV	0.43	0.48	1.7	
GRPCE-01-SS-		Vinyl Chloride	1	U	ppbV	0.95	1	1	U
GRPCE-01-SS-		cis-1,2-Dichloroethene	2.6	U	ug/m3	2.4	2.6	2.6	U
GRPCE-01-SS-		Tetrachloroethene	2300		ug/m3	1.8	2.6	2300	J
GRPCE-01-SS-		trans-1,2-Dichloroethene	2.6	U	ug/m3	2.3	2.6	2.6	U
GRPCE-01-SS-		Trichloroethene (TCE)	9.2		ug/m3	2.3	2.6	9.2	
GRPCE-01-SS-		Vinyl Chloride	2.6	U	ug/m3	2.4	2.6	2.6	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	0.48	U	ppbV	0.44	0.48	0.48	U
GRPCE-02-SS-		Tetrachloroethene	230		ppbV	0.2	0.28	230	J
GRPCE-02-SS-		trans-1,2-Dichloroethene	0.48	U	ppbV	0.43	0.48	0.48	U

GRAND RAPIDS VI ER ANALYTICAL RESULTS SUMMARY
ALS ENVIRONMENTAL REPORT NO. P1700532

Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-02-SS-		Trichloroethene (TCE)	5.5		ppbV	0.31	0.35	5.5	
GRPCE-02-SS-		Vinyl Chloride	0.74	U	ppbV	0.7	0.74	0.74	U
GRPCE-02-SS-		cis-1,2-Dichloroethene	1.9	U	ug/m3	1.7	1.9	1.9	U
GRPCE-02-SS-		Tetrachloroethene	1600		ug/m3	1.4	1.9	1600	J
GRPCE-02-SS-		trans-1,2-Dichloroethene	1.9	U	ug/m3	1.7	1.9	1.9	U
GRPCE-02-SS-		Trichloroethene (TCE)	30		ug/m3	1.7	1.9	30	
GRPCE-02-SS-		Vinyl Chloride	1.9	U	ug/m3	1.8	1.9	1.9	U
GRPCE-03-IA-	(Basement)	cis-1,2-Dichloroethene	0.032	U	ppbV	0.029	0.032	0.032	U
GRPCE-03-IA-	(Basement)	Tetrachloroethene	0.21		ppbV	0.013	0.019	0.21	J
GRPCE-03-IA-	(Basement)	trans-1,2-Dichloroethene	0.032	U	ppbV	0.029	0.032	0.032	U
GRPCE-03-IA-	(Basement)	Trichloroethene (TCE)	0.024	U	ppbV	0.021	0.024	0.024	U
GRPCE-03-IA-	(Basement)	Vinyl Chloride	0.05	U	ppbV	0.047	0.05	0.05	U
GRPCE-03-IA-	(Basement)	cis-1,2-Dichloroethene	0.13	U	ug/m3	0.12	0.13	0.13	U
GRPCE-03-IA-	(Basement)	Tetrachloroethene	1.4		ug/m3	0.091	0.13	1.4	J
GRPCE-03-IA-	(Basement)	trans-1,2-Dichloroethene	0.13	U	ug/m3	0.12	0.13	0.13	U
GRPCE-03-IA-	(Basement)	Trichloroethene (TCE)	0.13	U	ug/m3	0.11	0.13	0.13	U
GRPCE-03-IA-	(Basement)	Vinyl Chloride	0.13	U	ug/m3	0.12	0.13	0.13	U
GRPCE-03-IA-	(Main)	cis-1,2-Dichloroethene	0.034	U	ppbV	0.032	0.034	0.034	U
GRPCE-03-IA-	(Main)	Tetrachloroethene	0.13		ppbV	0.014	0.02	0.13	J
GRPCE-03-IA-	(Main)	trans-1,2-Dichloroethene	0.034	U	ppbV	0.031	0.034	0.034	U
GRPCE-03-IA-	(Main)	Trichloroethene (TCE)	0.025	U	ppbV	0.023	0.025	0.025	U
GRPCE-03-IA-	(Main)	Vinyl Chloride	0.053	U	ppbV	0.051	0.053	0.053	U
GRPCE-03-IA-	(Main)	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-03-IA-	(Main)	Tetrachloroethene	0.88		ug/m3	0.098	0.14	0.88	J
GRPCE-03-IA-	(Main)	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-03-IA-	(Main)	Trichloroethene (TCE)	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-03-IA-	(Main)	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-07-IA-	(Basement)	Tetrachloroethene	0.24		ppbV	0.016	0.022	0.24	J
GRPCE-07-IA-	(Basement)	trans-1,2-Dichloroethene	0.038	U	ppbV	0.034	0.038	0.038	U
GRPCE-07-IA-	(Basement)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-07-IA-	(Basement)	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-07-IA-	(Basement)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U

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Samp_No	Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-07-IA-[REDACTED] (Basement)	Tetrachloroethene	1.6		ug/m3	0.11	0.15	1.6	J
GRPCE-07-IA-[REDACTED] (Basement)	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Tetrachloroethene	0.24		ppbV	0.016	0.022	0.24	J
GRPCE-07-IA-[REDACTED] (Basement)-DP	trans-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Tetrachloroethene	1.6		ug/m3	0.11	0.15	1.6	J
GRPCE-07-IA-[REDACTED] (Basement)-DP	trans-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-07-IA-[REDACTED] (Basement)-DP	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-[REDACTED]	cis-1,2-Dichloroethene	0.037	U	ppbV	0.034	0.037	0.037	U
GRPCE-45-IA-[REDACTED]	Tetrachloroethene	0.14		ppbV	0.016	0.022	0.14	J
GRPCE-45-IA-[REDACTED]	trans-1,2-Dichloroethene	1.3		ppbV	0.034	0.037	1.3	
GRPCE-45-IA-[REDACTED]	Trichloroethene (TCE)	0.027	U	ppbV	0.024	0.027	0.027	U
GRPCE-45-IA-[REDACTED]	Vinyl Chloride	0.057	U	ppbV	0.054	0.057	0.057	U
GRPCE-45-IA-[REDACTED]	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-45-IA-[REDACTED]	Tetrachloroethene	0.96		ug/m3	0.11	0.15	0.96	J
GRPCE-45-IA-[REDACTED]	trans-1,2-Dichloroethene	5.1		ug/m3	0.13	0.15	5.1	
GRPCE-45-IA-[REDACTED]	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-45-IA-[REDACTED]	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-[REDACTED] DP	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-45-IA-[REDACTED] DP	Tetrachloroethene	0.14		ppbV	0.016	0.022	0.14	J
GRPCE-45-IA-[REDACTED] DP	trans-1,2-Dichloroethene	1.3		ppbV	0.035	0.038	1.3	
GRPCE-45-IA-[REDACTED] DP	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-45-IA-[REDACTED] DP	Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-45-IA-[REDACTED] DP	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-[REDACTED] DP	Tetrachloroethene	0.97		ug/m3	0.11	0.15	0.97	J
GRPCE-45-IA-[REDACTED] DP	trans-1,2-Dichloroethene	5.3		ug/m3	0.14	0.15	5.3	
GRPCE-45-IA-[REDACTED] DP	Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U

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Samp_No		Analyte	Result	Lab_Qualifier	Units	MDL	RL	Val_Result	Val_Qualifier
GRPCE-45-IA-	DP	Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-		cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-45-IA-		Tetrachloroethene	0.12		ppbV	0.016	0.022	0.12	J
GRPCE-45-IA-		trans-1,2-Dichloroethene	1.1		ppbV	0.034	0.038	1.1	
GRPCE-45-IA-		Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-45-IA-		Vinyl Chloride	0.058	U	ppbV	0.055	0.058	0.058	U
GRPCE-45-IA-		cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-		Tetrachloroethene	0.82		ug/m3	0.11	0.15	0.82	J
GRPCE-45-IA-		trans-1,2-Dichloroethene	4.2		ug/m3	0.14	0.15	4.2	
GRPCE-45-IA-		Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-45-IA-		Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-	(Basement)	cis-1,2-Dichloroethene	0.049	U	ppbV	0.045	0.049	0.049	U
GRPCE-45-IA-	(Basement)	Tetrachloroethene	0.16		ppbV	0.021	0.029	0.16	J
GRPCE-45-IA-	(Basement)	trans-1,2-Dichloroethene	2.2		ppbV	0.045	0.049	2.2	
GRPCE-45-IA-	(Basement)	Trichloroethene (TCE)	0.036	U	ppbV	0.032	0.036	0.036	U
GRPCE-45-IA-	(Basement)	Vinyl Chloride	0.076	U	ppbV	0.072	0.076	0.076	U
GRPCE-45-IA-	(Basement)	cis-1,2-Dichloroethene	0.2	U	ug/m3	0.18	0.2	0.2	U
GRPCE-45-IA-	(Basement)	Tetrachloroethene	1.1		ug/m3	0.14	0.2	1.1	J
GRPCE-45-IA-	(Basement)	trans-1,2-Dichloroethene	8.8		ug/m3	0.18	0.2	8.8	
GRPCE-45-IA-	(Basement)	Trichloroethene (TCE)	0.2	U	ug/m3	0.17	0.2	0.2	U
GRPCE-45-IA-	(Basement)	Vinyl Chloride	0.2	U	ug/m3	0.19	0.2	0.2	U
GRPCE-45-IA-	(Main)	cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-45-IA-	(Main)	Tetrachloroethene	0.12		ppbV	0.016	0.023	0.12	J
GRPCE-45-IA-	(Main)	trans-1,2-Dichloroethene	0.69		ppbV	0.035	0.039	0.69	
GRPCE-45-IA-	(Main)	Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-45-IA-	(Main)	Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-45-IA-	(Main)	cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-	(Main)	Tetrachloroethene	0.79		ug/m3	0.11	0.15	0.79	J
GRPCE-45-IA-	(Main)	trans-1,2-Dichloroethene	2.8		ug/m3	0.14	0.15	2.8	
GRPCE-45-IA-	(Main)	Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-45-IA-	(Main)	Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-46-IA-	(1)	cis-1,2-Dichloroethene	0.038	U	ppbV	0.035	0.038	0.038	U
GRPCE-46-IA-	(1)	Tetrachloroethene	0.067		ppbV	0.016	0.022	0.067	J

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GRPCE-46-IA	(1) trans-1,2-Dichloroethene	0.11		ppbV	0.035	0.038	0.11	
GRPCE-46-IA	(1) Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-46-IA	(1) Vinyl Chloride	0.059	U	ppbV	0.056	0.059	0.059	U
GRPCE-46-IA	(1) cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-46-IA	(1) Tetrachloroethene	0.45		ug/m3	0.11	0.15	0.45	J
GRPCE-46-IA	(1) trans-1,2-Dichloroethene	0.42		ug/m3	0.14	0.15	0.42	
GRPCE-46-IA	(1) Trichloroethene (TCE)	0.15	U	ug/m3	0.13	0.15	0.15	U
GRPCE-46-IA	(1) Vinyl Chloride	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-46-IA	(2) cis-1,2-Dichloroethene	0.039	U	ppbV	0.036	0.039	0.039	U
GRPCE-46-IA	(2) Tetrachloroethene	0.091		ppbV	0.016	0.023	0.091	J
GRPCE-46-IA	(2) trans-1,2-Dichloroethene	0.35		ppbV	0.035	0.039	0.35	
GRPCE-46-IA	(2) Trichloroethene (TCE)	0.028	U	ppbV	0.025	0.028	0.028	U
GRPCE-46-IA	(2) Vinyl Chloride	0.06	U	ppbV	0.057	0.06	0.06	U
GRPCE-46-IA	(2) cis-1,2-Dichloroethene	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-46-IA	(2) Tetrachloroethene	0.62		ug/m3	0.11	0.15	0.62	J
GRPCE-46-IA	(2) trans-1,2-Dichloroethene	1.4		ug/m3	0.14	0.15	1.4	
GRPCE-46-IA	(2) Trichloroethene (TCE)	0.15	U	ug/m3	0.14	0.15	0.15	U
GRPCE-46-IA	(2) Vinyl Chloride	0.15	U	ug/m3	0.15	0.15	0.15	U
GRPCE-49-OA	cis-1,2-Dichloroethene	0.034	U	ppbV	0.032	0.034	0.034	U
GRPCE-49-OA	Tetrachloroethene	0.062		ppbV	0.014	0.02	0.062	J
GRPCE-49-OA	trans-1,2-Dichloroethene	0.034	U	ppbV	0.031	0.034	0.034	U
GRPCE-49-OA	Trichloroethene (TCE)	0.025	U	ppbV	0.023	0.025	0.025	U
GRPCE-49-OA	Vinyl Chloride	0.053	U	ppbV	0.051	0.053	0.053	U
GRPCE-49-OA	cis-1,2-Dichloroethene	0.14	U	ug/m3	0.13	0.14	0.14	U
GRPCE-49-OA	Tetrachloroethene	0.42		ug/m3	0.098	0.14	0.42	J
GRPCE-49-OA	trans-1,2-Dichloroethene	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-49-OA	Trichloroethene (TCE)	0.14	U	ug/m3	0.12	0.14	0.14	U
GRPCE-49-OA	Vinyl Chloride	0.14	U	ug/m3	0.13	0.14	0.14	U