STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
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Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

May 14, 2018

Tetra Tech EM Inc.
1 South Wacker Drive
Chicago, IL 60606

Telephone: (312) 201-7700
Fax: (312) 938-0118

Analytical Report for STAT Work Order: 18050351 Revision 0

RE: 103X90260004S051804208, 2018 Superior Refinery Fire, Superior, Wisconsin

Dear Justin Button-Hutchens:

STAT Analysis received 3 samples for the referenced project on 5/9/2018 10:23:00 AM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAP standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Craig Chawla
Project Manager

The information contained in this report and any attachments is confidential information intended only for the use of the individual or entities named above. The results of this report relate only to the samples tested. If you have received this report in error, please notify us immediately by phone. Tl report shall not be reproduced, except in its entirety, unless written approval has been obtained from the laboratory. This analytical report shall beco property of the Customer upon payment in full. Otherwise, STAT will be under no obligation to support, defend or discuss the analytical report.

Analysis Corporation

Date: May 14, 2018

Client: Tetra Tech EM Inc.
Project: 103X90260004S051804208, 2018 Superior Refinery Fi
Work Order: 18050351 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
18050351-001A	Upwind		5/7/2018 1:50:00 PM	5/9/2018
18050351-002A	Downwind Fenceline		5/7/2018 1:50:00 PM	5/9/2018
18050351-003A	Downwind Community		5/7/2018 1:50:00 PM	5/9/2018

Analysis Corporation

Date: *May 14, 2018*

CLIENT: Tetra Tech EM Inc.
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Su
Work Order: 18050351 Revision 0

CASE NARRATIVE

TO-15 results that are reported in µg/m³ are calculated based on a temperature of 25°C, atmospheric pressure of 760 mm Hg, and the molecular weight of the analyte.

The TO-15 Continuing Calibration Verification (CCV) had recovery outside of control limits for the following elements:
1,2,4-Trichlorobenzene: 69.5% recovery (QC Limits 70-130%)
Hexachlorobutadiene: 66.7% recovery (QC Limits 70-130%)
Naphthalene: 65.0% recovery (QC Limits 70-130%)

The TO-15 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) had recoveries of the following compounds outside of control limits:
1,4-Dioxane: 68.2%/64.6% (LCS/LCSD) recovery (QC limits 70-130%)
2-Hexanone: 67.6% (LCSD) recovery (QC limits 70-130%)
Dichlorodifluoromethane: 68.2% (LCSD) recovery (QC limits 70-130%)

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Upwind
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-001A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	0.30		ppbv	1	5/13/2018
1,1,2-Trichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1-Dichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
1,2,4-Trichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,2,4-Trimethylbenzene	ND	0.30		ppbv	1	5/13/2018
1,2-Dibromoethane	ND	0.30		ppbv	1	5/13/2018
1,2-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,2-Dichloroethane	ND	0.30		ppbv	1	5/13/2018
1,2-Dichloropropane	ND	0.30		ppbv	1	5/13/2018
1,3,5-Trimethylbenzene	ND	0.30		ppbv	1	5/13/2018
1,3-Butadiene	ND	0.30		ppbv	1	5/13/2018
1,3-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,4-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,4-Dioxane	ND	0.75		ppbv	1	5/13/2018
2-Butanone	ND	0.75		ppbv	1	5/13/2018
2-Hexanone	ND	1.5		ppbv	1	5/13/2018
4-Ethyltoluene	ND	0.30		ppbv	1	5/13/2018
4-Methyl-2-pentanone	ND	1.5		ppbv	1	5/13/2018
Acetone	ND	3.0	*	ppbv	1	5/13/2018
Benzene	0.38	0.30		ppbv	1	5/13/2018
Benzyl chloride	ND	0.75		ppbv	1	5/13/2018
Bromodichloromethane	ND	0.30		ppbv	1	5/13/2018
Bromoform	ND	0.75		ppbv	1	5/13/2018
Bromomethane	ND	0.75		ppbv	1	5/13/2018
Carbon disulfide	ND	0.30		ppbv	1	5/13/2018
Carbon tetrachloride	ND	0.30		ppbv	1	5/13/2018
Chlorobenzene	ND	0.30		ppbv	1	5/13/2018
Chloroethane	ND	0.30		ppbv	1	5/13/2018
Chloroform	ND	0.30		ppbv	1	5/13/2018
Chloromethane	ND	0.75		ppbv	1	5/13/2018
cis-1,2-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
cis-1,3-Dichloropropene	ND	0.30		ppbv	1	5/13/2018
Cyclohexane	ND	0.30		ppbv	1	5/13/2018
Dibromochloromethane	ND	0.30		ppbv	1	5/13/2018
Dichlorodifluoromethane	0.38	0.30		ppbv	1	5/13/2018
Ethyl acetate	ND	0.75		ppbv	1	5/13/2018

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Upwind
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-001A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Ethylbenzene	ND	0.30		ppbv	1	5/13/2018
Freon-113	ND	0.30		ppbv	1	5/13/2018
Freon-114	ND	1.5		ppbv	1	5/13/2018
Heptane	ND	0.30		ppbv	1	5/13/2018
Hexachlorobutadiene	ND	0.30		ppbv	1	5/13/2018
Hexane	ND	0.75		ppbv	1	5/13/2018
Isopropyl Alcohol	ND	1.5		ppbv	1	5/13/2018
m,p-Xylene	ND	0.60		ppbv	1	5/13/2018
Methyl tert-butyl ether	ND	0.30		ppbv	1	5/13/2018
Methylene chloride	ND	3.0		ppbv	1	5/13/2018
Naphthalene	ND	0.30		ppbv	1	5/13/2018
o-Xylene	ND	0.30		ppbv	1	5/13/2018
Propene	ND	3.0		ppbv	1	5/13/2018
Styrene	ND	0.30		ppbv	1	5/13/2018
Tetrachloroethene	ND	0.30		ppbv	1	5/13/2018
Tetrahydrofuran	ND	0.75		ppbv	1	5/13/2018
Toluene	0.68	0.30		ppbv	1	5/13/2018
trans-1,2-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
trans-1,3-Dichloropropene	ND	0.30		ppbv	1	5/13/2018
Trichloroethene	ND	0.30		ppbv	1	5/13/2018
Trichlorofluoromethane	ND	0.30		ppbv	1	5/13/2018
Vinyl acetate	ND	3.0		ppbv	1	5/13/2018
Vinyl chloride	ND	0.30		ppbv	1	5/13/2018
Xylenes, Total	ND	0.90		ppbv	1	5/13/2018
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	1.6		µg/m³	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	2.1		µg/m³	1	5/13/2018
1,1,2-Trichloroethane	ND	1.6		µg/m³	1	5/13/2018
1,1-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,1-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
1,2,4-Trichlorobenzene	ND	2.2		µg/m³	1	5/13/2018
1,2,4-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,2-Dibromoethane	ND	2.3		µg/m³	1	5/13/2018
1,2-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,2-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,2-Dichloropropane	ND	1.4		µg/m³	1	5/13/2018
1,3,5-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,3-Butadiene	ND	0.66		µg/m³	1	5/13/2018

Qualifiers:
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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Upwind
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-001A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,3-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dioxane	ND	2.7		µg/m³	1	5/13/2018
2-Butanone	ND	2.2		µg/m³	1	5/13/2018
2-Hexanone	ND	6.2		µg/m³	1	5/13/2018
4-Ethyltoluene	ND	1.5		µg/m³	1	5/13/2018
4-Methyl-2-pentanone	ND	6.2		µg/m³	1	5/13/2018
Acetone	ND	7.1	*	µg/m³	1	5/13/2018
Benzene	1.2	0.96		µg/m³	1	5/13/2018
Benzyl chloride	ND	3.9		µg/m³	1	5/13/2018
Bromodichloromethane	ND	2.0		µg/m³	1	5/13/2018
Bromoform	ND	7.8		µg/m³	1	5/13/2018
Bromomethane	ND	2.9		µg/m³	1	5/13/2018
Carbon disulfide	ND	0.94		µg/m³	1	5/13/2018
Carbon tetrachloride	ND	1.9		µg/m³	1	5/13/2018
Chlorobenzene	ND	1.4		µg/m³	1	5/13/2018
Chloroethane	ND	0.79		µg/m³	1	5/13/2018
Chloroform	ND	1.5		µg/m³	1	5/13/2018
Chloromethane	ND	1.6		µg/m³	1	5/13/2018
cis-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
cis-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Cyclohexane	ND	1.0		µg/m³	1	5/13/2018
Dibromochloromethane	ND	2.6		µg/m³	1	5/13/2018
Dichlorodifluoromethane	1.9	1.5		µg/m³	1	5/13/2018
Ethyl acetate	ND	2.7		µg/m³	1	5/13/2018
Ethylbenzene	ND	1.3		µg/m³	1	5/13/2018
Freon-113	ND	2.3		µg/m³	1	5/13/2018
Freon-114	ND	11		µg/m³	1	5/13/2018
Heptane	ND	1.2		µg/m³	1	5/13/2018
Hexachlorobutadiene	ND	3.2		µg/m³	1	5/13/2018
Hexane	ND	2.6		µg/m³	1	5/13/2018
Isopropyl Alcohol	ND	3.7		µg/m³	1	5/13/2018
m,p-Xylene	ND	2.6		µg/m³	1	5/13/2018
Methyl tert-butyl ether	ND	1.1		µg/m³	1	5/13/2018
Methylene chloride	ND	10		µg/m³	1	5/13/2018
Naphthalene	ND	1.6		µg/m³	1	5/13/2018
o-Xylene	ND	1.3		µg/m³	1	5/13/2018
Propene	ND	5.2		µg/m³	1	5/13/2018

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Upwind
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-001A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Styrene	ND	1.3		µg/m³	1	5/13/2018
Tetrachloroethene	ND	2.0		µg/m³	1	5/13/2018
Tetrahydrofuran	ND	2.2		µg/m³	1	5/13/2018
Toluene	2.5	1.1		µg/m³	1	5/13/2018
trans-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
trans-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Trichloroethene	ND	1.6		µg/m³	1	5/13/2018
Trichlorofluoromethane	ND	1.7		µg/m³	1	5/13/2018
Vinyl acetate	ND	11		µg/m³	1	5/13/2018
Vinyl chloride	ND	0.77		µg/m³	1	5/13/2018
Xylenes, Total	ND	3.9		µg/m³	1	5/13/2018

Qualifiers:
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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Fenceline
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-002A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	0.30		ppbv	1	5/13/2018
1,1,2-Trichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1-Dichloroethane	ND	0.30		ppbv	1	5/13/2018
1,1-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
1,2,4-Trichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,2,4-Trimethylbenzene	ND	0.30		ppbv	1	5/13/2018
1,2-Dibromoethane	ND	0.30		ppbv	1	5/13/2018
1,2-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,2-Dichloroethane	ND	0.30		ppbv	1	5/13/2018
1,2-Dichloropropane	ND	0.30		ppbv	1	5/13/2018
1,3,5-Trimethylbenzene	ND	0.30		ppbv	1	5/13/2018
1,3-Butadiene	ND	0.30		ppbv	1	5/13/2018
1,3-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,4-Dichlorobenzene	ND	0.30		ppbv	1	5/13/2018
1,4-Dioxane	ND	0.76		ppbv	1	5/13/2018
2-Butanone	ND	0.76		ppbv	1	5/13/2018
2-Hexanone	ND	1.5		ppbv	1	5/13/2018
4-Ethyltoluene	ND	0.30		ppbv	1	5/13/2018
4-Methyl-2-pentanone	ND	1.5		ppbv	1	5/13/2018
Acetone	3.8	3.0	*	ppbv	1	5/13/2018
Benzene	ND	0.30		ppbv	1	5/13/2018
Benzyl chloride	ND	0.76		ppbv	1	5/13/2018
Bromodichloromethane	ND	0.30		ppbv	1	5/13/2018
Bromoform	ND	0.76		ppbv	1	5/13/2018
Bromomethane	ND	0.76		ppbv	1	5/13/2018
Carbon disulfide	ND	0.30		ppbv	1	5/13/2018
Carbon tetrachloride	ND	0.30		ppbv	1	5/13/2018
Chlorobenzene	ND	0.30		ppbv	1	5/13/2018
Chloroethane	ND	0.30		ppbv	1	5/13/2018
Chloroform	ND	0.30		ppbv	1	5/13/2018
Chloromethane	ND	0.76		ppbv	1	5/13/2018
cis-1,2-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
cis-1,3-Dichloropropene	ND	0.30		ppbv	1	5/13/2018
Cyclohexane	ND	0.30		ppbv	1	5/13/2018
Dibromochloromethane	ND	0.30		ppbv	1	5/13/2018
Dichlorodifluoromethane	0.38	0.30		ppbv	1	5/13/2018
Ethyl acetate	ND	0.76		ppbv	1	5/13/2018

Qualifiers:
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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Fenceline
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-002A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Ethylbenzene	ND	0.30		ppbv	1	5/13/2018
Freon-113	ND	0.30		ppbv	1	5/13/2018
Freon-114	ND	1.5		ppbv	1	5/13/2018
Heptane	ND	0.30		ppbv	1	5/13/2018
Hexachlorobutadiene	ND	0.30		ppbv	1	5/13/2018
Hexane	ND	0.76		ppbv	1	5/13/2018
Isopropyl Alcohol	ND	1.5		ppbv	1	5/13/2018
m,p-Xylene	ND	0.60		ppbv	1	5/13/2018
Methyl tert-butyl ether	ND	0.30		ppbv	1	5/13/2018
Methylene chloride	ND	3.0		ppbv	1	5/13/2018
Naphthalene	ND	0.30		ppbv	1	5/13/2018
o-Xylene	ND	0.30		ppbv	1	5/13/2018
Propene	ND	3.0		ppbv	1	5/13/2018
Styrene	ND	0.30		ppbv	1	5/13/2018
Tetrachloroethene	ND	0.30		ppbv	1	5/13/2018
Tetrahydrofuran	ND	0.76		ppbv	1	5/13/2018
Toluene	0.30	0.30		ppbv	1	5/13/2018
trans-1,2-Dichloroethene	ND	0.30		ppbv	1	5/13/2018
trans-1,3-Dichloropropene	ND	0.30		ppbv	1	5/13/2018
Trichloroethene	ND	0.30		ppbv	1	5/13/2018
Trichlorofluoromethane	ND	0.30		ppbv	1	5/13/2018
Vinyl acetate	ND	3.0		ppbv	1	5/13/2018
Vinyl chloride	ND	0.30		ppbv	1	5/13/2018
Xylenes, Total	ND	0.91		ppbv	1	5/13/2018
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	1.6		µg/m³	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	2.1		µg/m³	1	5/13/2018
1,1,2-Trichloroethane	ND	1.6		µg/m³	1	5/13/2018
1,1-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,1-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
1,2,4-Trichlorobenzene	ND	2.2		µg/m³	1	5/13/2018
1,2,4-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,2-Dibromoethane	ND	2.3		µg/m³	1	5/13/2018
1,2-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,2-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,2-Dichloropropane	ND	1.4		µg/m³	1	5/13/2018
1,3,5-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,3-Butadiene	ND	0.67		µg/m³	1	5/13/2018

Qualifiers:
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Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Fenceline
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-002A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,3-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dioxane	ND	2.7		µg/m³	1	5/13/2018
2-Butanone	ND	2.2		µg/m³	1	5/13/2018
2-Hexanone	ND	6.2		µg/m³	1	5/13/2018
4-Ethyltoluene	ND	1.5		µg/m³	1	5/13/2018
4-Methyl-2-pentanone	ND	6.2		µg/m³	1	5/13/2018
Acetone	8.9	7.2	*	µg/m³	1	5/13/2018
Benzene	ND	0.97		µg/m³	1	5/13/2018
Benzyl chloride	ND	3.9		µg/m³	1	5/13/2018
Bromodichloromethane	ND	2.0		µg/m³	1	5/13/2018
Bromoform	ND	7.8		µg/m³	1	5/13/2018
Bromomethane	ND	2.9		µg/m³	1	5/13/2018
Carbon disulfide	ND	0.94		µg/m³	1	5/13/2018
Carbon tetrachloride	ND	1.9		µg/m³	1	5/13/2018
Chlorobenzene	ND	1.4		µg/m³	1	5/13/2018
Chloroethane	ND	0.80		µg/m³	1	5/13/2018
Chloroform	ND	1.5		µg/m³	1	5/13/2018
Chloromethane	ND	1.6		µg/m³	1	5/13/2018
cis-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
cis-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Cyclohexane	ND	1.0		µg/m³	1	5/13/2018
Dibromochloromethane	ND	2.6		µg/m³	1	5/13/2018
Dichlorodifluoromethane	1.9	1.5		µg/m³	1	5/13/2018
Ethyl acetate	ND	2.7		µg/m³	1	5/13/2018
Ethylbenzene	ND	1.3		µg/m³	1	5/13/2018
Freon-113	ND	2.3		µg/m³	1	5/13/2018
Freon-114	ND	11		µg/m³	1	5/13/2018
Heptane	ND	1.2		µg/m³	1	5/13/2018
Hexachlorobutadiene	ND	3.2		µg/m³	1	5/13/2018
Hexane	ND	2.7		µg/m³	1	5/13/2018
Isopropyl Alcohol	ND	3.7		µg/m³	1	5/13/2018
m,p-Xylene	ND	2.6		µg/m³	1	5/13/2018
Methyl tert-butyl ether	ND	1.1		µg/m³	1	5/13/2018
Methylene chloride	ND	11		µg/m³	1	5/13/2018
Naphthalene	ND	1.6		µg/m³	1	5/13/2018
o-Xylene	ND	1.3		µg/m³	1	5/13/2018
Propene	ND	5.2		µg/m³	1	5/13/2018

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Fenceline
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-002A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Styrene	ND	1.3		µg/m³	1	5/13/2018
Tetrachloroethene	ND	2.0		µg/m³	1	5/13/2018
Tetrahydrofuran	ND	2.2		µg/m³	1	5/13/2018
Toluene	1.1	1.1		µg/m³	1	5/13/2018
trans-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
trans-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Trichloroethene	ND	1.6		µg/m³	1	5/13/2018
Trichlorofluoromethane	ND	1.7		µg/m³	1	5/13/2018
Vinyl acetate	ND	11		µg/m³	1	5/13/2018
Vinyl chloride	ND	0.77		µg/m³	1	5/13/2018
Xylenes, Total	ND	3.9		µg/m³	1	5/13/2018

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Community
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-003A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	0.31		ppbv	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	0.31		ppbv	1	5/13/2018
1,1,2-Trichloroethane	ND	0.31		ppbv	1	5/13/2018
1,1-Dichloroethane	ND	0.31		ppbv	1	5/13/2018
1,1-Dichloroethene	ND	0.31		ppbv	1	5/13/2018
1,2,4-Trichlorobenzene	ND	0.31		ppbv	1	5/13/2018
1,2,4-Trimethylbenzene	ND	0.31		ppbv	1	5/13/2018
1,2-Dibromoethane	ND	0.31		ppbv	1	5/13/2018
1,2-Dichlorobenzene	ND	0.31		ppbv	1	5/13/2018
1,2-Dichloroethane	ND	0.31		ppbv	1	5/13/2018
1,2-Dichloropropane	ND	0.31		ppbv	1	5/13/2018
1,3,5-Trimethylbenzene	ND	0.31		ppbv	1	5/13/2018
1,3-Butadiene	ND	0.31		ppbv	1	5/13/2018
1,3-Dichlorobenzene	ND	0.31		ppbv	1	5/13/2018
1,4-Dichlorobenzene	ND	0.31		ppbv	1	5/13/2018
1,4-Dioxane	ND	0.77		ppbv	1	5/13/2018
2-Butanone	ND	0.77		ppbv	1	5/13/2018
2-Hexanone	ND	1.5		ppbv	1	5/13/2018
4-Ethyltoluene	ND	0.31		ppbv	1	5/13/2018
4-Methyl-2-pentanone	ND	1.5		ppbv	1	5/13/2018
Acetone	ND	3.1	*	ppbv	1	5/13/2018
Benzene	ND	0.31		ppbv	1	5/13/2018
Benzyl chloride	ND	0.77		ppbv	1	5/13/2018
Bromodichloromethane	ND	0.31		ppbv	1	5/13/2018
Bromoform	ND	0.77		ppbv	1	5/13/2018
Bromomethane	ND	0.77		ppbv	1	5/13/2018
Carbon disulfide	ND	0.31		ppbv	1	5/13/2018
Carbon tetrachloride	ND	0.31		ppbv	1	5/13/2018
Chlorobenzene	ND	0.31		ppbv	1	5/13/2018
Chloroethane	ND	0.31		ppbv	1	5/13/2018
Chloroform	ND	0.31		ppbv	1	5/13/2018
Chloromethane	ND	0.77		ppbv	1	5/13/2018
cis-1,2-Dichloroethene	ND	0.31		ppbv	1	5/13/2018
cis-1,3-Dichloropropene	ND	0.31		ppbv	1	5/13/2018
Cyclohexane	ND	0.31		ppbv	1	5/13/2018
Dibromochloromethane	ND	0.31		ppbv	1	5/13/2018
Dichlorodifluoromethane	0.37	0.31		ppbv	1	5/13/2018
Ethyl acetate	ND	0.77		ppbv	1	5/13/2018

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Community
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-003A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Ethylbenzene	ND	0.31		ppbv	1	5/13/2018
Freon-113	ND	0.31		ppbv	1	5/13/2018
Freon-114	ND	1.5		ppbv	1	5/13/2018
Heptane	ND	0.31		ppbv	1	5/13/2018
Hexachlorobutadiene	ND	0.31		ppbv	1	5/13/2018
Hexane	ND	0.77		ppbv	1	5/13/2018
Isopropyl Alcohol	ND	1.5		ppbv	1	5/13/2018
m,p-Xylene	ND	0.61		ppbv	1	5/13/2018
Methyl tert-butyl ether	ND	0.31		ppbv	1	5/13/2018
Methylene chloride	ND	3.1		ppbv	1	5/13/2018
Naphthalene	ND	0.31		ppbv	1	5/13/2018
o-Xylene	ND	0.31		ppbv	1	5/13/2018
Propene	ND	3.1		ppbv	1	5/13/2018
Styrene	ND	0.31		ppbv	1	5/13/2018
Tetrachloroethene	ND	0.31		ppbv	1	5/13/2018
Tetrahydrofuran	ND	0.77		ppbv	1	5/13/2018
Toluene	ND	0.31		ppbv	1	5/13/2018
trans-1,2-Dichloroethene	ND	0.31		ppbv	1	5/13/2018
trans-1,3-Dichloropropene	ND	0.31		ppbv	1	5/13/2018
Trichloroethene	ND	0.31		ppbv	1	5/13/2018
Trichlorofluoromethane	ND	0.31		ppbv	1	5/13/2018
Vinyl acetate	ND	3.1		ppbv	1	5/13/2018
Vinyl chloride	ND	0.31		ppbv	1	5/13/2018
Xylenes, Total	ND	0.92		ppbv	1	5/13/2018
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,1,1-Trichloroethane	ND	1.7		µg/m³	1	5/13/2018
1,1,2,2-Tetrachloroethane	ND	2.1		µg/m³	1	5/13/2018
1,1,2-Trichloroethane	ND	1.7		µg/m³	1	5/13/2018
1,1-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,1-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
1,2,4-Trichlorobenzene	ND	2.3		µg/m³	1	5/13/2018
1,2,4-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,2-Dibromoethane	ND	2.4		µg/m³	1	5/13/2018
1,2-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,2-Dichloroethane	ND	1.2		µg/m³	1	5/13/2018
1,2-Dichloropropane	ND	1.4		µg/m³	1	5/13/2018
1,3,5-Trimethylbenzene	ND	1.5		µg/m³	1	5/13/2018
1,3-Butadiene	ND	0.68		µg/m³	1	5/13/2018

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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc. **Client Sample ID:** Downwind Community
Work Order: 18050351 Revision 0 **Tag Number:**
Project: 103X90260004S051804208, 2018 Superior Refinery **Collection Date:** 5/7/2018 1:50:00 PM
Lab ID: 18050351-003A **Matrix:** Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
1,3-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dichlorobenzene	ND	1.8		µg/m³	1	5/13/2018
1,4-Dioxane	ND	2.8		µg/m³	1	5/13/2018
2-Butanone	ND	2.3		µg/m³	1	5/13/2018
2-Hexanone	ND	6.3		µg/m³	1	5/13/2018
4-Ethyltoluene	ND	1.5		µg/m³	1	5/13/2018
4-Methyl-2-pentanone	ND	6.3		µg/m³	1	5/13/2018
Acetone	ND	7.3	*	µg/m³	1	5/13/2018
Benzene	ND	0.98		µg/m³	1	5/13/2018
Benzyl chloride	ND	4.0		µg/m³	1	5/13/2018
Bromodichloromethane	ND	2.1		µg/m³	1	5/13/2018
Bromoform	ND	7.9		µg/m³	1	5/13/2018
Bromomethane	ND	3.0		µg/m³	1	5/13/2018
Carbon disulfide	ND	0.96		µg/m³	1	5/13/2018
Carbon tetrachloride	ND	1.9		µg/m³	1	5/13/2018
Chlorobenzene	ND	1.4		µg/m³	1	5/13/2018
Chloroethane	ND	0.81		µg/m³	1	5/13/2018
Chloroform	ND	1.5		µg/m³	1	5/13/2018
Chloromethane	ND	1.6		µg/m³	1	5/13/2018
cis-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
cis-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Cyclohexane	ND	1.1		µg/m³	1	5/13/2018
Dibromochloromethane	ND	2.6		µg/m³	1	5/13/2018
Dichlorodifluoromethane	1.8	1.5		µg/m³	1	5/13/2018
Ethyl acetate	ND	2.8		µg/m³	1	5/13/2018
Ethylbenzene	ND	1.3		µg/m³	1	5/13/2018
Freon-113	ND	2.4		µg/m³	1	5/13/2018
Freon-114	ND	11		µg/m³	1	5/13/2018
Heptane	ND	1.3		µg/m³	1	5/13/2018
Hexachlorobutadiene	ND	3.3		µg/m³	1	5/13/2018
Hexane	ND	2.7		µg/m³	1	5/13/2018
Isopropyl Alcohol	ND	3.8		µg/m³	1	5/13/2018
m,p-Xylene	ND	2.7		µg/m³	1	5/13/2018
Methyl tert-butyl ether	ND	1.1		µg/m³	1	5/13/2018
Methylene chloride	ND	11		µg/m³	1	5/13/2018
Naphthalene	ND	1.6		µg/m³	1	5/13/2018
o-Xylene	ND	1.3		µg/m³	1	5/13/2018
Propene	ND	5.3		µg/m³	1	5/13/2018

Qualifiers:
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Report Date: May 14, 2018
Print Date: May 14, 2018

ANALYTICAL RESULTS

Client: Tetra Tech EM Inc.
Client Sample ID: Downwind Community
Work Order: 18050351 Revision 0
Tag Number:
Project: 103X90260004S051804208, 2018 Superior Refinery
Collection Date: 5/7/2018 1:50:00 PM
Lab ID: 18050351-003A
Matrix: Air

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds in Air by GC/MS TO-15				Prep Date: **5/10/2018**		Analyst: **AOA**
Styrene	ND	1.3		µg/m³	1	5/13/2018
Tetrachloroethene	ND	2.1		µg/m³	1	5/13/2018
Tetrahydrofuran	ND	2.3		µg/m³	1	5/13/2018
Toluene	ND	1.2		µg/m³	1	5/13/2018
trans-1,2-Dichloroethene	ND	1.2		µg/m³	1	5/13/2018
trans-1,3-Dichloropropene	ND	1.4		µg/m³	1	5/13/2018
Trichloroethene	ND	1.7		µg/m³	1	5/13/2018
Trichlorofluoromethane	ND	1.7		µg/m³	1	5/13/2018
Vinyl acetate	ND	11		µg/m³	1	5/13/2018
Vinyl chloride	ND	0.78		µg/m³	1	5/13/2018
Xylenes, Total	ND	4.0		µg/m³	1	5/13/2018

Qualifiers:
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CHAIN OF CUSTODY RECORD

№: 915933 Page: 1 of 1

Company: Tetra Tech
Project Number: 103X9026[illegible]S051804208 Client Tracking No.:
Project Name: 2018 Superior Refinery Fire
Project Location: Superior Wisconsin
Sampler(s): Apryl Dennerth [signature]
Report To: Justin.Button-Hutchens@tetratech.com Phone: 312-201-7771
Fax:
QC Level: 1 ___ 2 ___ 3 ___ 4 X e-mail:

Quote No.:
P.O. No.:
Turn Around Time (Days): 1 (2) 3 4 5-7 10
Results Needed: / / am/pm

Client Sample Number/Description:	Date Taken	Time Taken	Matrix	Comp.	Grab	Preserv.	No. of Containers	TO-15	Additional Information:	Lab No.:
Upwind	5/7/18	1350	Air		X	A	1	X	60246	001
Downwind Fenceline	↓	1350	Air		X	A	1	X	60304	002
Downwind Community	↓	1350	Air		X	A	1	X	30362	003

Relinquished by: (Signature) [signature] Date/Time: 5/8/18 1100
Received by: (Signature) 7808719 57509 - FedEx Date/Time:
Relinquished by: (Signature) FedEx Date/Time:
Received by: (Signature) [signature] Date/Time: 5/9/18 1023
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:

Comments:

Preservation Code: A= None B= HNO_3 C= NaOH D= H_2SO_4 E= HCl F= 5035/EnCore G= Other

Laboratory Work Order No.: 18050351

Received on Ice: Yes ☐ No ☑

Temperature: [illegible] °C

STAT Analysis Corporation

Sample Receipt Checklist

Client Name TETRA CHICAGO

Date and Time Received: 5/9/2018 10:23:00 AM

Work Order Number 18050351

Received by: JOK

Checklist completed by: Signature Date 5/9/18

Reviewed by: MK Initials 5/10/18 Date

Matrix: Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature Ambient °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☐	No ☐
Water - Samples pH checked?	Yes ☐	No ☐	Checked by:
Water - Samples properly preserved?	Yes ☐	No ☐	pH Adjusted?

Any No response must be detailed in the comments section below.

Comments:

Client / Person contacted: Date contacted: Contacted by:

Response:

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT
Air Toxics
BatchID: R143512

ANALYTICAL RUN SUMMARY

SeqNo	Sample ID	Type	Test Code	Batch	DF	Date Analyzed
3999862	BFB051318-5	TUNE	BFB	R143512	1	05/13/2018 13:21
3999863	CCV051318-5 10	CCV	TO_15A+	R143512	1	05/13/2018 13:21
3999864	MB051318-5	MBLK	TO_15A+	R143512	1	05/13/2018 14:37
3999867	MB051318-5	MBLK	TO_15UG+	R143512	1	05/13/2018 14:37
3999870	MB051318-5	MBLK	TO_15MG+	R143512	1	05/13/2018 14:37
3999865	LCS051318-5	LCS	TO_15A+	R143512	1	05/13/2018 15:14
3999868	LCS051318-5	LCS	TO_15UG+	R143512	1	05/13/2018 15:14
3999871	LCS051318-5	LCS	TO_15MG+	R143512	1	05/13/2018 15:14
3999866	LCSD051318-5	LCSD	TO_15A+	R143512	1	05/13/2018 15:51
3999869	LCSD051318-5	LCSD	TO_15UG+	R143512	1	05/13/2018 15:51
3999872	LCSD051318-5	LCSD	TO_15MG+	R143512	1	05/13/2018 15:51
3999873	18050351-001A	SAMP	TO_15A+	108960	1	05/13/2018 17:11
3999876	18050351-001A	SAMP	TO_15UG+	108960	1	05/13/2018 17:11
3999874	18050351-002A	SAMP	TO_15A+	108960	1	05/13/2018 17:48
3999877	18050351-002A	SAMP	TO_15UG+	108960	1	05/13/2018 17:48
3999875	18050351-003A	SAMP	TO_15A+	108960	1	05/13/2018 18:25
3999878	18050351-003A	SAMP	TO_15UG+	108960	1	05/13/2018 18:25
4000283	18050406-001A	SAMP	TO_15MG+	109021	25	05/13/2018 20:21
4000343	18050406-002A	SAMP	TO_15MG+	109021	25	05/13/2018 22:03
4000359	18050406-003A	SAMP	TO_15MG+	109021	25	05/13/2018 22:40
4000515	18050406-004A	SAMP	TO_15MG+	109021	2	05/14/2018 10:21
4000516	18050406-005A	SAMP	TO_15MG+	109021	2	05/14/2018 10:58
4000518	18050406-006A	SAMP	TO_15MG+	109021	2	05/14/2018 11:35
4000520	18050406-007A	SAMP	TO_15MG+	109021	2	05/14/2018 12:12
4000522	18050406-008A	SAMP	TO_15MG+	109021	2	05/14/2018 12:49

QC SUMMARY

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
MB051318-5	**ZZZZZ**	**MBLK**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999864**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	0.20									
1,1,2,2-Tetrachloroethane	ND	0.20									
1,1,2-Trichloroethane	ND	0.20									
1,1-Dichloroethane	ND	0.20									
1,1-Dichloroethene	ND	0.20									
1,2,4-Trichlorobenzene	ND	0.20									
1,2,4-Trimethylbenzene	ND	0.20									
1,2-Dibromoethane	ND	0.20									
1,2-Dichlorobenzene	ND	0.20									
1,2-Dichloroethane	ND	0.20									
1,2-Dichloropropane	ND	0.20									
1,3,5-Trimethylbenzene	ND	0.20									
1,3-Butadiene	ND	0.20									
1,3-Dichlorobenzene	ND	0.20									
1,4-Dichlorobenzene	ND	0.20									
1,4-Dioxane	ND	0.50									
2-Butanone	ND	0.50									
2-Hexanone	ND	1.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT
Air Toxics
BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
MB051318-5	**ZZZZZ**	**MBLK**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999864**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4-Ethyltoluene	ND	0.20									
4-Methyl-2-pentanone	ND	1.0									
Acetone	0.26	2.0									J*
Benzene	ND	0.20									
Benzyl chloride	ND	0.50									
Bromodichloromethane	ND	0.20									
Bromoform	ND	0.50									
Bromomethane	0.07	0.50									J
Carbon disulfide	ND	0.20									
Carbon tetrachloride	ND	0.20									
Chlorobenzene	ND	0.20									
Chloroethane	ND	0.20									
Chloroform	ND	0.20									
Chloromethane	ND	0.50									
cis-1,2-Dichloroethene	ND	0.20									
cis-1,3-Dichloropropene	ND	0.20									
Cyclohexane	ND	0.20									
Dibromochloromethane	ND	0.20									
Dichlorodifluoromethane	ND	0.20									
Ethyl acetate	ND	0.50									
Ethylbenzene	ND	0.20									
Freon-113	ND	0.20									
Freon-114	ND	1.0									
Heptane	ND	0.20									
Hexachlorobutadiene	ND	0.20									
Hexane	ND	0.50									
Isopropyl Alcohol	ND	1.0									
m,p-Xylene	ND	0.40									
Methyl tert-butyl ether	ND	0.20									
Methylene chloride	ND	2.0									
Naphthalene	ND	0.20									
o-Xylene	ND	0.20									
Propene	ND	2.0									
Styrene	ND	0.20									
Tetrachloroethene	ND	0.20									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.20									
trans-1,2-Dichloroethene	ND	0.20									
trans-1,3-Dichloropropene	ND	0.20									
Trichloroethene	ND	0.20									
Trichlorofluoromethane	ND	0.20									
Vinyl acetate	ND	2.0									
Vinyl chloride	ND	0.20									
Xylenes, Total	ND	0.60									

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCS051318-5	**ZZZZZ**	**LCS**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999865**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	4.39	0.20	5	0	87.8	70	130	0	0		

Qualifiers:
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R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT

Air Toxics

BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCS051318-5	**ZZZZZ**	**LCS**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999865**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,2,2-Tetrachloroethane	4.37	0.20	5	0	87.4	70	130	0	0		
1,1,2-Trichloroethane	4.61	0.20	5	0	92.2	70	130	0	0		
1,1-Dichloroethane	4.38	0.20	5	0	87.6	70	130	0	0		
1,1-Dichloroethene	4.36	0.20	5	0	87.2	70	130	0	0		
1,2,4-Trichlorobenzene	4.1	0.20	5	0	82	70	130	0	0		
1,2,4-Trimethylbenzene	4.07	0.20	5	0	81.4	70	130	0	0		
1,2-Dibromoethane	4.73	0.20	5	0	94.6	70	130	0	0		
1,2-Dichlorobenzene	4.19	0.20	5	0	83.8	70	130	0	0		
1,2-Dichloroethane	4.2	0.20	5	0	84	70	130	0	0		
1,2-Dichloropropane	4.3	0.20	5	0	86	70	130	0	0		
1,3,5-Trimethylbenzene	4.1	0.20	5	0	82	70	130	0	0		
1,3-Butadiene	5.37	0.20	5	0	107	70	130	0	0		
1,3-Dichlorobenzene	4.41	0.20	5	0	88.2	70	130	0	0		
1,4-Dichlorobenzene	4.06	0.20	5	0	81.2	70	130	0	0		
1,4-Dioxane	3.41	0.50	5	0	68.2	70	130	0	0		S
2-Butanone	4.41	0.50	5	0	88.2	70	130	0	0		
2-Hexanone	3.5	1.0	5	0	70	70	130	0	0		
4-Ethyltoluene	4.33	0.20	5	0	86.6	70	130	0	0		
4-Methyl-2-pentanone	4.12	1.0	5	0	82.4	70	130	0	0		
Acetone	3.9	2.0	5	0.26	72.8	70	130	0	0		*
Benzene	4.15	0.20	5	0	83	70	130	0	0		
Benzyl chloride	3.99	0.50	5	0	79.8	70	130	0	0		
Bromodichloromethane	4.23	0.20	5	0	84.6	70	130	0	0		
Bromoform	4.5	0.50	5	0	90	70	130	0	0		
Bromomethane	5.17	0.50	5	0.07	102	70	130	0	0		
Carbon disulfide	4.47	0.20	5	0	89.4	70	130	0	0		
Carbon tetrachloride	4.81	0.20	5	0	96.2	70	130	0	0		
Chlorobenzene	4.25	0.20	5	0	85	70	130	0	0		
Chloroethane	5.23	0.20	5	0	105	70	130	0	0		
Chloroform	4.2	0.20	5	0	84	70	130	0	0		
Chloromethane	3.94	0.50	5	0	78.8	70	130	0	0		
cis-1,2-Dichloroethene	4.33	0.20	5	0	86.6	70	130	0	0		
cis-1,3-Dichloropropene	4.81	0.20	5	0	96.2	70	130	0	0		
Cyclohexane	4.24	0.20	5	0	84.8	70	130	0	0		
Dibromochloromethane	4.53	0.20	5	0	90.6	70	130	0	0		
Dichlorodifluoromethane	3.53	0.20	5	0	70.6	70	130	0	0		
Ethyl acetate	5.74	0.50	5	0	115	70	130	0	0		
Ethylbenzene	4.26	0.20	5	0	85.2	70	130	0	0		
Freon-113	4.42	0.20	5	0	88.4	70	130	0	0		
Freon-114	3.69	1.0	5	0	73.8	70	130	0	0		
Heptane	4.36	0.20	5	0	87.2	70	130	0	0		
Hexachlorobutadiene	3.92	0.20	5	0	78.4	70	130	0	0		
Hexane	4.33	0.50	5	0	86.6	70	130	0	0		
Isopropyl Alcohol	4.37	1.0	5	0	87.4	70	130	0	0		
m,p-Xylene	8.15	0.40	10	0	81.5	70	130	0	0		
Methyl tert-butyl ether	4.17	0.20	5	0	83.4	70	130	0	0		
Methylene chloride	3.92	2.0	5	0	78.4	70	130	0	0		
Naphthalene	4.46	0.20	5	0	89.2	70	130	0	0		
o-Xylene	4.12	0.20	5	0	82.4	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
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* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT
Air Toxics
BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCS051318-5	**ZZZZZ**	**LCS**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999865**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Propene	4.1	2.0	5	0	82	70	130	0	0		
Styrene	4.46	0.20	5	0	89.2	70	130	0	0		
Tetrachloroethene	3.69	0.20	5	0	73.8	70	130	0	0		
Tetrahydrofuran	4.29	0.50	5	0	85.8	70	130	0	0		
Toluene	4.33	0.20	5	0	86.6	70	130	0	0		
trans-1,2-Dichloroethene	4.54	0.20	5	0	90.8	70	130	0	0		
trans-1,3-Dichloropropene	4.38	0.20	5	0	87.6	70	130	0	0		
Trichloroethene	4.34	0.20	5	0	86.8	70	130	0	0		
Trichlorofluoromethane	3.95	0.20	5	0	79	70	130	0	0		
Vinyl acetate	3.85	2.0	5	0	77	70	130	0	0		
Vinyl chloride	5.32	0.20	5	0	106	70	130	0	0		
Xylenes, Total	12.27	0.60	15	0	81.8	70	130	0	0		

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCSD051318-5	**ZZZZZ**	**LCSD**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999866**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	4.35	0.20	5	0	87	70	130	4.39	0.915	25	
1,1,2,2-Tetrachloroethane	4.35	0.20	5	0	87	70	130	4.37	0.459	25	
1,1,2-Trichloroethane	4.6	0.20	5	0	92	70	130	4.61	0.217	25	
1,1-Dichloroethane	4.36	0.20	5	0	87.2	70	130	4.38	0.458	25	
1,1-Dichloroethene	4.36	0.20	5	0	87.2	70	130	4.36	0	25	
1,2,4-Trichlorobenzene	4.09	0.20	5	0	81.8	70	130	4.1	0.244	25	
1,2,4-Trimethylbenzene	4.06	0.20	5	0	81.2	70	130	4.07	0.246	25	
1,2-Dibromoethane	4.63	0.20	5	0	92.6	70	130	4.73	2.14	25	
1,2-Dichlorobenzene	4.2	0.20	5	0	84	70	130	4.19	0.238	25	
1,2-Dichloroethane	4.15	0.20	5	0	83	70	130	4.2	1.20	25	
1,2-Dichloropropane	4.3	0.20	5	0	86	70	130	4.3	0	25	
1,3,5-Trimethylbenzene	4.08	0.20	5	0	81.6	70	130	4.1	0.489	25	
1,3-Butadiene	5.29	0.20	5	0	106	70	130	5.37	1.50	25	
1,3-Dichlorobenzene	4.4	0.20	5	0	88	70	130	4.41	0.227	25	
1,4-Dichlorobenzene	4.08	0.20	5	0	81.6	70	130	4.06	0.491	25	
1,4-Dioxane	3.23	0.50	5	0	64.6	70	130	3.41	5.42	25	S
2-Butanone	4.55	0.50	5	0	91	70	130	4.41	3.13	25	
2-Hexanone	3.38	1.0	5	0	67.6	70	130	3.5	3.49	25	S
4-Ethyltoluene	4.32	0.20	5	0	86.4	70	130	4.33	0.231	25	
4-Methyl-2-pentanone	4.06	1.0	5	0	81.2	70	130	4.12	1.47	25	
Acetone	3.89	2.0	5	0.26	72.6	70	130	3.9	0.257	25	*
Benzene	4.1	0.20	5	0	82	70	130	4.15	1.21	25	
Benzyl chloride	4	0.50	5	0	80	70	130	3.99	0.250	25	
Bromodichloromethane	4.23	0.20	5	0	84.6	70	130	4.23	0	25	
Bromoform	4.47	0.50	5	0	89.4	70	130	4.5	0.669	25	
Bromomethane	5.16	0.50	5	0.07	102	70	130	5.17	0.194	25	
Carbon disulfide	4.48	0.20	5	0	89.6	70	130	4.47	0.223	25	
Carbon tetrachloride	4.73	0.20	5	0	94.6	70	130	4.81	1.68	25	
Chlorobenzene	4.24	0.20	5	0	84.8	70	130	4.25	0.236	25	
Chloroethane	5.31	0.20	5	0	106	70	130	5.23	1.52	25	
Chloroform	4.14	0.20	5	0	82.8	70	130	4.2	1.44	25	
Chloromethane	3.83	0.50	5	0	76.6	70	130	3.94	2.83	25	
cis-1,2-Dichloroethene	4.36	0.20	5	0	87.2	70	130	4.33	0.690	25	

Qualifiers:
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H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT
Air Toxics
BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCSD051318-5	**ZZZZZ**	**LCSD**	**ppbv**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999866**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,3-Dichloropropene	4.78	0.20	5	0	95.6	70	130	4.81	0.626	25	
Cyclohexane	4.22	0.20	5	0	84.4	70	130	4.24	0.473	25	
Dibromochloromethane	4.51	0.20	5	0	90.2	70	130	4.53	0.442	25	
Dichlorodifluoromethane	3.41	0.20	5	0	68.2	70	130	3.53	3.46	25	S
Ethyl acetate	5.65	0.50	5	0	113	70	130	5.74	1.58	25	
Ethylbenzene	4.26	0.20	5	0	85.2	70	130	4.26	0	25	
Freon-113	4.35	0.20	5	0	87	70	130	4.42	1.60	25	
Freon-114	3.51	1.0	5	0	70.2	70	130	3.69	5.00	25	
Heptane	4.35	0.20	5	0	87	70	130	4.36	0.230	25	
Hexachlorobutadiene	3.92	0.20	5	0	78.4	70	130	3.92	0	25	
Hexane	4.24	0.50	5	0	84.8	70	130	4.33	2.10	25	
Isopropyl Alcohol	4.33	1.0	5	0	86.6	70	130	4.37	0.920	25	
m,p-Xylene	8.18	0.40	10	0	81.8	70	130	8.15	0.367	25	
Methyl tert-butyl ether	4.16	0.20	5	0	83.2	70	130	4.17	0.240	25	
Methylene chloride	3.89	2.0	5	0	77.8	70	130	3.92	0.768	25	
Naphthalene	4.4	0.20	5	0	88	70	130	4.46	1.35	25	
o-Xylene	4.14	0.20	5	0	82.8	70	130	4.12	0.484	25	
Propene	4.11	2.0	5	0	82.2	70	130	4.1	0.244	25	
Styrene	4.47	0.20	5	0	89.4	70	130	4.46	0.224	25	
Tetrachloroethene	3.63	0.20	5	0	72.6	70	130	3.69	1.64	25	
Tetrahydrofuran	4.21	0.50	5	0	84.2	70	130	4.29	1.88	25	
Toluene	4.28	0.20	5	0	85.6	70	130	4.33	1.16	25	
trans-1,2-Dichloroethene	4.53	0.20	5	0	90.6	70	130	4.54	0.221	25	
trans-1,3-Dichloropropene	4.33	0.20	5	0	86.6	70	130	4.38	1.15	25	
Trichloroethene	4.28	0.20	5	0	85.6	70	130	4.34	1.39	25	
Trichlorofluoromethane	3.94	0.20	5	0	78.8	70	130	3.95	0.253	25	
Vinyl acetate	3.81	2.0	5	0	76.2	70	130	3.85	1.04	25	
Vinyl chloride	5.39	0.20	5	0	108	70	130	5.32	1.31	25	
Xylenes, Total	12.31	0.60	15	0	82.1	70	130	12.27	0.325	25	

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
MB051318-5	**ZZZZZ**	**MBLK**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999867**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.1									
1,1,2,2-Tetrachloroethane	ND	1.4									
1,1,2-Trichloroethane	ND	1.1									
1,1-Dichloroethane	ND	0.81									
1,1-Dichloroethene	ND	0.79									
1,2,4-Trichlorobenzene	ND	1.5									
1,2,4-Trimethylbenzene	ND	0.98									
1,2-Dibromoethane	ND	1.5									
1,2-Dichlorobenzene	ND	1.2									
1,2-Dichloroethane	ND	0.81									
1,2-Dichloropropane	ND	0.92									
1,3,5-Trimethylbenzene	ND	0.98									
1,3-Butadiene	ND	0.44									
1,3-Dichlorobenzene	ND	1.2									
1,4-Dichlorobenzene	ND	1.2									
1,4-Dioxane	ND	1.8									

Qualifiers:
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R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT

Air Toxics

BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
MB051318-5	**ZZZZZ**	**MBLK**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999867**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
2-Butanone	ND	1.5									
2-Hexanone	ND	4.1									
4-Ethyltoluene	ND	0.98									
4-Methyl-2-pentanone	ND	4.1									
Acetone	0.6176	4.8									J*
Benzene	ND	0.64									
Benzyl chloride	ND	2.6									
Bromodichloromethane	ND	1.3									
Bromoform	ND	5.2									
Bromomethane	0.2718	1.9									J
Carbon disulfide	ND	0.62									
Carbon tetrachloride	ND	1.3									
Chlorobenzene	ND	0.92									
Chloroethane	ND	0.53									
Chloroform	ND	0.98									
Chloromethane	ND	1.0									
cis-1,2-Dichloroethene	ND	0.79									
cis-1,3-Dichloropropene	ND	0.91									
Cyclohexane	ND	0.69									
Dibromochloromethane	ND	1.7									
Dichlorodifluoromethane	ND	0.99									
Ethyl acetate	ND	1.8									
Ethylbenzene	ND	0.87									
Freon-113	ND	1.5									
Freon-114	ND	7.0									
Heptane	ND	0.82									
Hexachlorobutadiene	ND	2.1									
Hexane	ND	1.8									
Isopropyl Alcohol	ND	2.5									
m,p-Xylene	ND	1.7									
Methyl tert-butyl ether	ND	0.72									
Methylene chloride	ND	6.9									
Naphthalene	ND	1.0									
o-Xylene	ND	0.87									
Propene	ND	3.4									
Styrene	ND	0.85									
Tetrachloroethene	ND	1.4									
Tetrahydrofuran	ND	1.5									
Toluene	ND	0.75									
trans-1,2-Dichloroethene	ND	0.79									
trans-1,3-Dichloropropene	ND	0.91									
Trichloroethene	ND	1.1									
Trichlorofluoromethane	ND	1.1									
Vinyl acetate	ND	7.0									
Vinyl chloride	ND	0.51									
Xylenes, Total	ND	2.6									

Qualifiers:
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E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT

Air Toxics

BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCS051318-5	**ZZZZZ**	**LCS**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999868**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	23.95	1.1	27.28	0	87.8	70	130	0	0		
1,1,2,2-Tetrachloroethane	30.01	1.4	34.34	0	87.4	70	130	0	0		
1,1,2-Trichloroethane	25.15	1.1	27.28	0	92.2	70	130	0	0		
1,1-Dichloroethane	17.73	0.81	20.24	0	87.6	70	130	0	0		
1,1-Dichloroethene	17.29	0.79	19.82	0	87.2	70	130	0	0		
1,2,4-Trichlorobenzene	30.43	1.5	37.11	0	82	70	130	0	0		
1,2,4-Trimethylbenzene	20.01	0.98	24.58	0	81.4	70	130	0	0		
1,2-Dibromoethane	36.34	1.5	38.42	0	94.6	70	130	0	0		
1,2-Dichlorobenzene	25.19	1.2	30.06	0	83.8	70	130	0	0		
1,2-Dichloroethane	17	0.81	20.24	0	84	70	130	0	0		
1,2-Dichloropropane	19.87	0.92	23.11	0	86	70	130	0	0		
1,3,5-Trimethylbenzene	20.15	0.98	24.58	0	82	70	130	0	0		
1,3-Butadiene	11.88	0.44	11.06	0	107	70	130	0	0		
1,3-Dichlorobenzene	26.51	1.2	30.06	0	88.2	70	130	0	0		
1,4-Dichlorobenzene	24.41	1.2	30.06	0	81.2	70	130	0	0		
1,4-Dioxane	12.29	1.8	18.02	0	68.2	70	130	0	0		S
2-Butanone	13.01	1.5	14.75	0	88.2	70	130	0	0		
2-Hexanone	14.34	4.1	20.48	0	70	70	130	0	0		S
4-Ethyltoluene	21.29	0.98	24.58	0	86.6	70	130	0	0		
4-Methyl-2-pentanone	16.88	4.1	20.48	0	82.4	70	130	0	0		
Acetone	9.264	4.8	11.88	0.6176	72.8	70	130	0	0		*
Benzene	13.26	0.64	15.97	0	83	70	130	0	0		
Benzyl chloride	20.66	2.6	25.89	0	79.8	70	130	0	0		
Bromodichloromethane	28.34	1.3	33.5	0	84.6	70	130	0	0		
Bromoform	46.51	5.2	51.68	0	90	70	130	0	0		
Bromomethane	20.08	1.9	19.42	0.2718	102	70	130	0	0		
Carbon disulfide	13.92	0.62	15.57	0	89.4	70	130	0	0		
Carbon tetrachloride	30.26	1.3	31.46	0	96.2	70	130	0	0		
Chlorobenzene	19.57	0.92	23.02	0	85	70	130	0	0		
Chloroethane	13.8	0.53	13.19	0	105	70	130	0	0		
Chloroform	20.51	0.98	24.41	0	84	70	130	0	0		
Chloromethane	8.136	1.0	10.33	0	78.8	70	130	0	0		
cis-1,2-Dichloroethene	17.17	0.79	19.82	0	86.6	70	130	0	0		
cis-1,3-Dichloropropene	21.83	0.91	22.69	0	96.2	70	130	0	0		
Cyclohexane	14.59	0.69	17.21	0	84.8	70	130	0	0		
Dibromochloromethane	38.59	1.7	42.59	0	90.6	70	130	0	0		
Dichlorodifluoromethane	17.46	0.99	24.73	0	70.6	70	130	0	0		
Ethyl acetate	20.69	1.8	18.02	0	115	70	130	0	0		
Ethylbenzene	18.5	0.87	21.71	0	85.2	70	130	0	0		
Freon-113	33.87	1.5	38.32	0	88.4	70	130	0	0		
Freon-114	25.8	7.0	34.95	0	73.8	70	130	0	0		
Heptane	17.87	0.82	20.49	0	87.2	70	130	0	0		
Hexachlorobutadiene	41.81	2.1	53.33	0	78.4	70	130	0	0		
Hexane	15.26	1.8	17.62	0	86.6	70	130	0	0		
Isopropyl Alcohol	10.74	2.5	12.29	0	87.4	70	130	0	0		
m,p-Xylene	35.39	1.7	43.42	0	81.5	70	130	0	0		
Methyl tert-butyl ether	15.03	0.72	18.03	0	83.4	70	130	0	0		
Methylene chloride	13.62	6.9	17.37	0	78.4	70	130	0	0		
Naphthalene	23.38	1.0	26.21	0	89.2	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
* - Non Accredited Parameter
H/HT - Holding Time Exceeded

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT
Air Toxics
BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCS051318-5	**ZZZZZ**	**LCS**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999868**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
o-Xylene	17.89	0.87	21.71	0	82.4	70	130	0	0		
Propene	7.056	3.4	8.605	0	82	70	130	0	0		
Styrene	19	0.85	21.3	0	89.2	70	130	0	0		
Tetrachloroethene	25.03	1.4	33.91	0	73.8	70	130	0	0		
Tetrahydrofuran	12.65	1.5	14.75	0	85.8	70	130	0	0		
Toluene	16.32	0.75	18.84	0	86.6	70	130	0	0		
trans-1,2-Dichloroethene	18	0.79	19.82	0	90.8	70	130	0	0		
trans-1,3-Dichloropropene	19.88	0.91	22.69	0	87.6	70	130	0	0		
Trichloroethene	23.32	1.1	26.87	0	86.8	70	130	0	0		
Trichlorofluoromethane	22.19	1.1	28.09	0	79	70	130	0	0		
Vinyl acetate	13.56	7.0	17.61	0	77	70	130	0	0		
Vinyl chloride	13.6	0.51	12.78	0	106	70	130	0	0		
Xylenes, Total	53.28	2.6	65.13	0	81.8	70	130	0	0		

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCSD051318-5	**ZZZZZ**	**LCSD**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999869**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	23.73	1.1	27.28	0	87	70	130	23.95	0.915	25	
1,1,2,2-Tetrachloroethane	29.87	1.4	34.34	0	87	70	130	30.01	0.459	25	
1,1,2-Trichloroethane	25.1	1.1	27.28	0	92	70	130	25.15	0.217	25	
1,1-Dichloroethane	17.65	0.81	20.24	0	87.2	70	130	17.73	0.458	25	
1,1-Dichloroethene	17.29	0.79	19.82	0	87.2	70	130	17.29	0	25	
1,2,4-Trichlorobenzene	30.35	1.5	37.11	0	81.8	70	130	30.43	0.244	25	
1,2,4-Trimethylbenzene	19.96	0.98	24.58	0	81.2	70	130	20.01	0.246	25	
1,2-Dibromoethane	35.57	1.5	38.42	0	92.6	70	130	36.34	2.14	25	
1,2-Dichlorobenzene	25.25	1.2	30.06	0	84	70	130	25.19	0.238	25	
1,2-Dichloroethane	16.8	0.81	20.24	0	83	70	130	17	1.20	25	
1,2-Dichloropropane	19.87	0.92	23.11	0	86	70	130	19.87	0	25	
1,3,5-Trimethylbenzene	20.06	0.98	24.58	0	81.6	70	130	20.15	0.489	25	
1,3-Butadiene	11.7	0.44	11.06	0	106	70	130	11.88	1.50	25	
1,3-Dichlorobenzene	26.45	1.2	30.06	0	88	70	130	26.51	0.227	25	
1,4-Dichlorobenzene	24.53	1.2	30.06	0	81.6	70	130	24.41	0.491	25	
1,4-Dioxane	11.64	1.8	18.02	0	64.6	70	130	12.29	5.42	25	S
2-Butanone	13.42	1.5	14.75	0	91	70	130	13.01	3.13	25	
2-Hexanone	13.85	4.1	20.48	0	67.6	70	130	14.34	3.49	25	S
4-Ethyltoluene	21.24	0.98	24.58	0	86.4	70	130	21.29	0.231	25	
4-Methyl-2-pentanone	16.63	4.1	20.48	0	81.2	70	130	16.88	1.47	25	
Acetone	9.241	4.8	11.88	0.6176	72.6	70	130	9.264	0.257	25	*
Benzene	13.1	0.64	15.97	0	82	70	130	13.26	1.21	25	
Benzyl chloride	20.71	2.6	25.89	0	80	70	130	20.66	0.250	25	
Bromodichloromethane	28.34	1.3	33.5	0	84.6	70	130	28.34	0	25	
Bromoform	46.2	5.2	51.68	0	89.4	70	130	46.51	0.669	25	
Bromomethane	20.04	1.9	19.42	0.2718	102	70	130	20.08	0.194	25	
Carbon disulfide	13.95	0.62	15.57	0	89.6	70	130	13.92	0.223	25	
Carbon tetrachloride	29.76	1.3	31.46	0	94.6	70	130	30.26	1.68	25	
Chlorobenzene	19.52	0.92	23.02	0	84.8	70	130	19.57	0.236	25	
Chloroethane	14.01	0.53	13.19	0	106	70	130	13.8	1.52	25	
Chloroform	20.21	0.98	24.41	0	82.8	70	130	20.51	1.44	25	
Chloromethane	7.909	1.0	10.33	0	76.6	70	130	8.136	2.83	25	

Qualifiers:
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H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Tetra Tech EM Inc.
Work Order: 18050351
Project: 103X90260004S051804208, 2018 Superior Refinery Fire, Sup

ANALYTICAL QC SUMMARY REPORT

Air Toxics

BatchID: R143512

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
LCSD051318-5	**ZZZZZ**	**LCSD**	**µg/m³**	**TO-15**		**5/13/2018**	**VOA-5_180513A**	**3999869**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	17.29	0.79	19.82	0	87.2	70	130	17.17	0.690	25	
cis-1,3-Dichloropropene	21.69	0.91	22.69	0	95.6	70	130	21.83	0.626	25	
Cyclohexane	14.53	0.69	17.21	0	84.4	70	130	14.59	0.473	25	
Dibromochloromethane	38.42	1.7	42.59	0	90.2	70	130	38.59	0.442	25	
Dichlorodifluoromethane	16.86	0.99	24.73	0	68.2	70	130	17.46	3.46	25	S
Ethyl acetate	20.36	1.8	18.02	0	113	70	130	20.69	1.58	25	
Ethylbenzene	18.5	0.87	21.71	0	85.2	70	130	18.5	0	25	
Freon-113	33.34	1.5	38.32	0	87	70	130	33.87	1.60	25	
Freon-114	24.54	7.0	34.95	0	70.2	70	130	25.8	5.00	25	
Heptane	17.83	0.82	20.49	0	87	70	130	17.87	0.230	25	
Hexachlorobutadiene	41.81	2.1	53.33	0	78.4	70	130	41.81	0	25	
Hexane	14.94	1.8	17.62	0	84.8	70	130	15.26	2.10	25	
Isopropyl Alcohol	10.64	2.5	12.29	0	86.6	70	130	10.74	0.920	25	
m,p-Xylene	35.52	1.7	43.42	0	81.8	70	130	35.39	0.367	25	
Methyl tert-butyl ether	15	0.72	18.03	0	83.2	70	130	15.03	0.240	25	
Methylene chloride	13.51	6.9	17.37	0	77.8	70	130	13.62	0.768	25	
Naphthalene	23.07	1.0	26.21	0	88	70	130	23.38	1.35	25	
o-Xylene	17.98	0.87	21.71	0	82.8	70	130	17.89	0.484	25	
Propene	7.074	3.4	8.605	0	82.2	70	130	7.056	0.244	25	
Styrene	19.04	0.85	21.3	0	89.4	70	130	19	0.224	25	
Tetrachloroethene	24.62	1.4	33.91	0	72.6	70	130	25.03	1.64	25	
Tetrahydrofuran	12.42	1.5	14.75	0	84.2	70	130	12.65	1.88	25	
Toluene	16.13	0.75	18.84	0	85.6	70	130	16.32	1.16	25	
trans-1,2-Dichloroethene	17.96	0.79	19.82	0	90.6	70	130	18	0.221	25	
trans-1,3-Dichloropropene	19.65	0.91	22.69	0	86.6	70	130	19.88	1.15	25	
Trichloroethene	23	1.1	26.87	0	85.6	70	130	23.32	1.39	25	
Trichlorofluoromethane	22.14	1.1	28.09	0	78.8	70	130	22.19	0.253	25	
Vinyl acetate	13.42	7.0	17.61	0	76.2	70	130	13.56	1.04	25	
Vinyl chloride	13.78	0.51	12.78	0	108	70	130	13.6	1.31	25	
Xylenes, Total	53.45	2.6	65.13	0	82.1	70	130	53.28	0.325	25	

Qualifiers:
ND - Not Detected at the Reporting Limit
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