Technical Memorandum

Date: February 29, 2016

To: Craig Zeller, P.E., USEPA Remedial Project Manager

From: Matthew Wallace, P.E., Project Coordinator
Amec Foster Wheeler Environment & Infrastructure, Inc.

Matthew E. Wallace

NORTH CAROLINA PROFESSIONAL SEAL 24933 ENGINEER MATTHEW E. WALLACE 2/29/16

Re: Mills Gap Road Groundwater Contamination Site
Springs Vapor Removal and Capture System
Amec Foster Wheeler Project 6690-03-9450
CERCLA Docket No. CERCLA-04-2004-3755
EPA ID: NCD003149556

Executive Summary

The Springs Vapor Removal and Capture System (System) was installed in late 2014 and has been operating to reduce indoor air trichloroethene (TCE) concentrations to within allowable limits. Sampling on multiple occasions has confirmed that the System is effective in controlling TCE vapor in and around the residences in the springs area east of the former plant site. Information on the System and its operation from late 2014 to early 2016 is included in this Technical Memorandum. Data are presented in this Technical Memorandum which provides information on considering site-specific ambient air 'action levels'.

System Operation, Maintenance, and Analytical Results

The System, which includes a cap/cover, air sparge and vapor extraction equipment, and vapor-phase carbon vessels, was installed in the springs area east of the former plant site in September and October 2014, and has been operational since October 21, 2014. The objective of the removal action is to reduce adjacent residences' indoor air TCE concentrations to below the United States Environmental Protection Agency's (USEPA's) residential indoor air Removal Management Level (RML) of 2 micrograms per cubic meter ($\mu g/m^3$).

As documented in the Springs Removal Action Report, dated March 23, 2015, and the Addendum, dated May 7, 2015, TCE concentrations in indoor air samples collected in November 2014, January 2015, and February 2015 were below the RML. Similarly, TCE concentrations in indoor air samples collected in April 2015 were below the RML (as reported in the Report of April 2015 Vapor Intrusion Monitoring, dated June 7, 2015). The Springs Removal Action Report indicated that two 85-gallon carbon vessels would be exchanged on an approximate quarterly basis and effluent samples would be collected approximately quarterly.

System influent and effluent air samples have been collected since October 2014. Influent samples collected on October 23, 2014, and January 7, 2015, indicated TCE concentrations of 3,300 $\mu g/m^3$ and 4,700 $\mu g/m^3$, respectively. Effluent samples collected at the discharge stack

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between October 2014 and May 2015 did not indicate TCE concentrations above the method detection limit (MDL). The concentration of TCE in an effluent sample collected on August 19, 2015, was 170 µg/m^3. The analytical report for this sample was received on August 31, 2015. The carbon vessels were already scheduled for replacement when the analytical report was received, and the vendor was notified to replace the vessels in a prompt manner. The carbon vessels were exchanged on September 11, 2015.

Ambient air samples were collected at AAS-05 and AAS-06 on October 21, 2015. The preliminary laboratory report for the October 2015 samples was received on November 6, 2015, and indicated TCE concentrations in the ambient air samples of 7.5 µg/m^3 (AAS-05) and 2.4 µg/m^3 (AAS-06). See previously submitted vapor intrusion assessment/monitoring reports for sampling locations.

Based on the elevated ambient air TCE concentrations with respect to TCE concentrations that had been reported since installation of the System, effluent samples were collected on November 18, 2015. The effluent sample collected at the discharge stack did not indicate a TCE concentration above the MDL of 14 µg/m^3. However, the TCE concentration in the air sample collected between carbon vessels, 6,300 µg/m^3, was higher than had previously been detected. On November 18, 2015, modifications to the System were made. These modifications included extending the effluent stack approximately 200 feet east of the equipment trailer and 28 feet above ground surface (i.e., further away from the springs area residences) and adding two 55-gallon vapor-phase carbon vessels to the carbon treatment system, which was already equipped with two 85-gallon vapor-phase carbon vessels.

Based on the elevated TCE readings in the October 2015 ambient air samples, USEPA required that additional ambient air samples be collected in November 2015 and submitted for an expedited laboratory analysis. Ambient air samples were collected on November 21, 2015, and the preliminary laboratory analytical report, received on November 24, 2015, indicated TCE concentrations of 5.6 µg/m^3 (AAS-05), 7.7 µg/m^3 (AAS-06) and 9.2 µg/m^3 (duplicate of AAS-06). Although the analytical results of the effluent samples collected on November 18, 2015, had not yet been received, influent and effluent samples were also collected on November 21, 2015, and submitted for an expedited laboratory analysis. The influent TCE concentration, 37,000 µg/m^3, was an order of magnitude greater than TCE concentrations detected in influent air samples in October 2014 and January 2015. TCE was detected at a concentration of 52 µg/m^3 in the effluent sample collected from the discharge stack.

Based on the elevated TCE concentrations in the November 21, 2015, ambient air samples, USEPA required collection and expedited laboratory analysis of indoor and crawlspace air samples, in addition to ambient air samples, in December 2015. Enhancements were made to the System on November 30 and December 1, 2015, which included installing two additional vapor extraction points in the vicinity of former Spring-03, adding liner in the area of former Spring-03, and improving the edge seal of the liner. Also, used vapor-phase carbon was removed from the 85-gallon carbon vessels and replaced with new vapor-phase carbon to compliment the additional new 55-gallon carbon vessels.

Crawlspace and indoor air samples were collected from the 261 Mills Gap Road residence and the 275 Mills Gap Road residence on December 2, 2015, as well as at ambient air sample locations AAS-05 and AAS-06 (Note: the residence at 271 Mills Gap Road was vacant at the time of sampling, so indoor/crawlspace air samples were not collected at the residence). TCE was detected in the crawlspace and indoor air samples collected from the 261 Mills Gap Road residence at concentrations below the RML. TCE was detected at concentrations above the 2

µg/m³ RML in the crawlspace and indoor air samples collected from 275 Mills Gap Road; however a woman of child-bearing age (sensitive subpopulation) does not reside at this residence and the air pathway was determined not to pose an unacceptable hazard or risk to current or future non-sensitive residential receptors living at the residence. TCE was detected at concentrations of 6.51 µg/m³ (AAS-05), 2.65 µg/m³ (AAS-06), and 2.59 µg/m³ (duplicate of AAS-06) in the ambient air samples.

In addition to the ambient, crawlspace, and indoor air samples, System influent and effluent air samples were also collected on December 2, 2015. TCE was detected at a concentration of 22,700 µg/m³ in the influent sample and 8.73 µg/m³ in the effluent sample collected at the discharge stack. Based on the increased TCE influent concentrations, it was decided that the carbon vessels would be exchanged on an approximate bi-monthly basis and effluent air samples would continue to be collected/analyzed quarterly. On January 7, 2016, additional enhancements were made to the System, which included installing one additional vapor extraction point in the vicinity of sparge points SP-3A and SP-3B (south of the System equipment trailer), and improving the edge seal of the liner in the area.

Ambient air and System influent/effluent samples were again collected on January 12, 2016. TCE was detected at concentrations of 0.46 µg/m³ (AAS-05) and 0.73 µg/m³ (AAS-06) in the ambient air samples. TCE was detected at a concentration of 19,000 µg/m³ in the System influent air sample and 51 µg/m³ in the effluent sample collected at the discharge stack.

A summary of air samples collected and carbon exchange dates since initiation of the System is presented in the following table. The May 2015 System effluent laboratory report that was inadvertently not submitted to USEPA in a monthly progress report is attached to this Technical Memorandum.

Concentrations of TCE in Ambient and Influent/Effluent Air Samples

Event	Date	AAS-05	AAS-06	Influent	Effluent
new carbon	10/21/14	N/A			
influent sample	10/23/14			3,300	
effluent sample	10/30/14				<1.4
ambient air samples	11/4/14	1.9	1.8 / 1.9*		
effluent sample	12/2/14				<9.3
new carbon	12/23/14	N/A			
influent/effluent sample	1/7/15			4,700	<1.4
ambient air samples	1/14/15	0.78	0.67 / 0.86*		
effluent sample	2/12/15				<5.6
ambient sample	2/19/15	0.15	0.96 / 1.1*		
new carbon	3/27/15	N/A			
ambient air samples	4/16/15	1.6	0.93 J		
effluent sample	5/6/15				<1.4
new carbon	6/17/15	N/A			
ambient air samples	7/16/15	0.80	0.20 / 0.21*		
effluent sample	8/19/15				170
new carbon	9/11/15	N/A			
ambient air samples	10/21/15	7.5	2.4		
effluent sample, prior to adding carbon	11/18/15				<14

Event	Date	AAS-05	AAS-06	Influent	Effluent
ambient/influent/effluent samples	11/21/15	5.6	7.7 / 9.2*	37,000	52
new carbon	11/30/15	N/A			
ambient/influent/effluent samples	12/2/15	6.51	2.65 / 2.59*	22,700	8.73
ambient/influent/effluent samples	1/13/16	0.46	0.73	19,000	51
new carbon	2/2/16	N/A			

Notes:
TCE concentrations reported in µg/m^3
Blank cells indicate a sample was not collected
N/A – not applicable
"<" – not detected above the indicated reporting limit
* analytical result of duplicate sample
J – estimated concentration

Regulatory Requirements

In USEPA's springs System approval with modifications letter, dated September 9, 2014, preliminary applicable or relevant and appropriate (ARAR) standards were identified, including 15A NCAC 02D .1104, which is the North Carolina air regulation for toxic emissions. The purpose of this regulation is to establish concentrations of specified compounds in ambient air at the property boundary from permitted discharges/emissions, such as from an industrial facility. As stated in 15A NCAC 02D .1102, these ambient 'fenceline' concentrations are applicable to facilities that are required to be permitted under 15A NCAC 02Q .0711. The System is not a facility that discharges more than the mass of specific compounds listed in 15A NCAC 02Q .0711, so the requirements of 15A NCAC 02D .1104 do not apply. This average annual ambient fenceline concentration is established to correlate to potential risk exposure to residences beyond the permitted facility's property boundary. This extrapolated and annually-averaged property boundary ambient concentration is not intended to be applied to concentrations from a discharge stack.

Nevertheless, this regulation, even though it should not be applicable to this scenario, states that the ambient concentration at the property boundary should not exceed the identified concentration on an annually-averaged basis. The regulatory annual average concentration limits, as well as the maximum concentration detected at AAS-05 or AAS-06, are indicated in the following table:

Compound	Regulatory Annually-Averaged Concentration Limit	Maximum Detected Concentration in Ambient Air
TCE	59	7.5
Vinyl Chloride	0.38	0.16

Notes:
Concentrations are in µg/m^3.
Ambient air concentrations are from samples collected since October 2014.
Cis-1,2-dichloroethene and trans-1,2-dichloroethene do not have regulatory standards.

We note that TCE and vinyl chloride do not have established 24-hour chronic or 1-hour acute fenceline ambient concentration levels.

The 24-hour ambient air concentrations in the area of the springs do not exceed the annually-averaged concentration limits established in 15A NCAC 02D .1104, even if this regulation were applicable.

Regulatory requirements for annual emissions are codified under the Western North Carolina Regional Air Quality Agency (WNCRAQA) Section 17.0711 (following NCAC 2H 0.0610, which has been repealed). The WNCRAQA regulations indicate that a permit is only required when total toxic pollutants exceed specified annual mass discharges. The regulatory not-to-exceed annual mass loading and associated estimated annual mass loading from the System (based on the maximum detected concentrations in effluent samples) are presented in the following table:

Compound	Regulatory Not-to-Exceed Loading	Estimated Loading from Discharge Stack
TCE	4,000	0.7
Vinyl Chloride	26	2.2
Total VOCs	10,000	87.2

Notes:
Loading amounts are in pounds/year.
Loading rate based on concentrations from samples collected since October 2014.
Total VOCs emission standard is codified at WNCRAQA Section 17.0102.
Cis-1,2-dichloroethene and trans-1,2-dichloroethene do not have regulatory standards.

The emissions from the System are well within the limits established in the WNCRAQA regulations.

Ambient Air Concentrations Requiring a Response

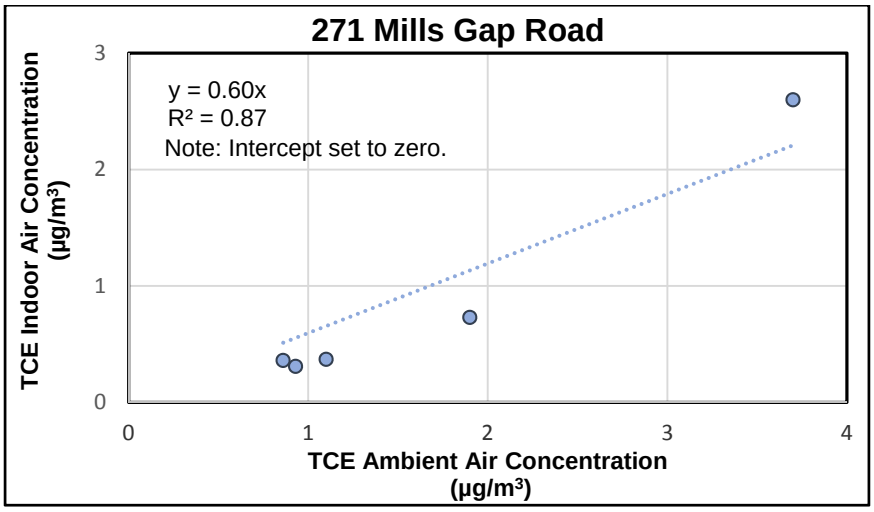
Ambient air samples AAS-05 and AAS-06 are located in a “worst-case” location between the springs area and the closest residences at 261/271 Mills Gap Road and 275 Mills Gap Road. Ambient air samples have also been collected in other directions between the springs area and additional residences, and the TCE concentrations, if detected, were below the 2 µg/m^3 RML during each sampling event.

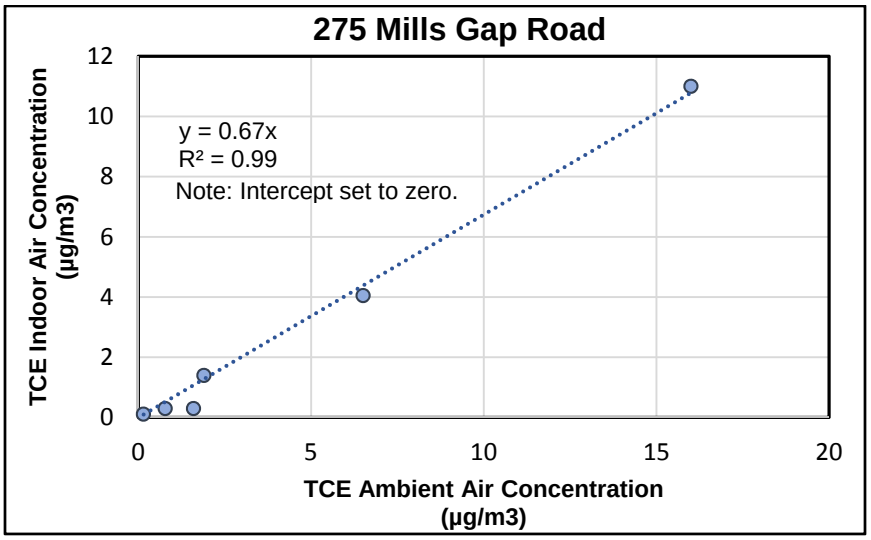
From November 2014 through July 2015, TCE concentrations in ambient air samples were below the RML, so a response, such as indoor air sampling, was not warranted. Similarly, from October 2014 through May 2015, TCE concentrations in effluent samples collected at the discharge stack were below the MDL, so a response was not required. The relatively elevated August 2015 effluent air TCE concentration, which was reported on August 30, 2015, indicated breakthrough of the carbon, and thus the carbon was promptly exchanged on September 11, 2015. Ambient air samples collected in October 2015 and preliminary results received on November 11, 2015, indicated TCE concentrations above previous ambient air sample results and the results were above the RML.

Since initiation of the System, establishing a specific ambient air “action level” was not necessary, as TCE concentrations in effluent samples were below the MDL and TCE concentrations in ambient air samples were below the RML.

Based on environmental conditions, there is a natural reduction in contaminant concentrations with increasing distance from a source area. Sufficient data has been collected to determine an attenuation factor between the ambient air sample locations and indoor air sample locations. By plotting the ambient air TCE concentrations against the indoor air TCE concentrations, a trendline can be developed and used to determine an attenuation factor (see plots below). A high correlation factor (R^2 value) results from the data, indicating a good correlation between the

data. Note that results for 271 Mills Gap Road were used, as the residence is closer to the springs/System than the residence at 261 Mills Gap Road.





The residence at 271 Mills Gap Road is closest to the source area and has the potential for a woman of child-bearing age to reside. Therefore, the TCE RML of 2 µg/m^3 is appropriate. Using the calculated attenuation factor of 0.60, in order for a TCE concentration in the residence to be 2 µg/m^3, the TCE concentration at the AAS-06 location would need to be at least 3.3 µg/m^3.

The residence of 275 Mills Gap Road does not contain a sensitive subpopulation/woman of child-bearing age. Therefore, a TCE RML of 6 µg/m^3 is considered appropriate. Using the calculated attenuation factor of 0.67, in order for a TCE concentration in the residence to be 6 µg/m^3, the TCE concentration at the AAS-06 location would need to be at least 9.0 µg/m^3.

Using an action level of 2 µg/m^3 at the ambient air locations is overly conservative, as the value is for indoor air and a sensitive subpopulation does not reside at the ambient air sampling

locations. We recommend using a TCE concentration of 3.3 µg/m^3 as an 'action level' concentration at the AAS-06 ambient air sampling location and a TCE concentration of 9.0 µg/m^3 at the AAS-05 ambient air sampling location. We will continue to evaluate the attenuation factor if additional ambient and indoor air data sets are collected at these locations.

Closing

If you have any questions regarding this Technical Memorandum, please contact Mr. Matthew Wallace at (828) 252-8130.

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LABORATORY REPORT

May 20, 2015

Susan Kelly
AMEC Foster Wheeler Environment & Infrastructure Inc.
1308 Patton Ave
Asheville, NC 28806-2604

RE: CTS of Asheville / 6690-03-9450

Dear Susan:

Enclosed are the results of the samples submitted to our laboratory on May 7, 2015. For your reference, these analyses have been assigned our service request number P1501859.

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

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

Respectfully submitted,

ALS | Environmental

By Kate Aguilera at 12:36 pm, May 20, 2015

Kate Aguilera
Project Manager

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Client: AMEC Foster Wheeler Environment & Infrastructure Inc. Service Request No: P1501859
Project: CTS of Asheville / 6690-03-9450

CASE NARRATIVE

The samples were received intact under chain of custody on May 7, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

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

The spike recoveries of Trichlorofluoromethane, Methylene Chloride and Carbon Disulfide in the Laboratory Control Sample (LCS) were outside the laboratory generated control criteria. The recovery errors equate to a potential high bias. However, the recoveries in question were within the method criteria; therefore, the data quality has not been significantly affected. No corrective action was taken.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272014-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

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

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

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: AMEC Foster Wheeler Environment & Infrastructure Inc. Service Request: P1501859

Project ID: CTS of Asheville / 6690-03-9450

Date Received: 5/7/2015

Time Received: 09:50

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	TO-15 Modified - VOC Bags
EFF-1	P1501859-001	Air	5/6/2015	15:00	X
EFF-2	P1501859-002	Air	5/6/2015	15:05	X

Air - Chain of Custody Record & Analytical Service Request

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

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

ALS Project No: P1501859

Company Name & Address (Reporting Information): Amec Foster Wheeler, 1308 Patton Avenue, Asheville, NC 28806

Project Name: CTS of Asheville

Project Number: 6690-03-9450

Project Manager: Susan Kelly

P.O. # / Billing Information: PO: C01250471 6; invoice to: susan.kelly@amecfw.com

Phone: 828 252 8130

Fax:

Email Address for Result Reporting: susan.kelly@amecfw.com

Sampler (Print & Sign): Susan Kelly

ALS Contact: F. Aguilera

Analysis Method: TO-15

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	TO-15		Comments e.g. Actual Preservative or specific instructions
EFF-1	1	5/6/15	1500	N/A					X		
EFF-2	2	5/6/15	1505	N/A					X		

Report Tier Levels - please select

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

EDD required YES / No
Type: Excel Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Susan Kelly FEDEX	5/6/15	1600	FEDEX		
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 5/7/15	Time: 0900

Cooler / Blank Temperature _____°C

ALS Environmental
Sample Acceptance Check Form

Client: AMEC Foster Wheeler Environment & Infrastructure Inc. Work order: P1501859

Project: CTS of Asheville / 6690-03-9450

Sample(s) received on: 5/7/15 Date opened: 5/7/15 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1501859-001.01	1.0 L Tedlar Bag					
P1501859-002.01	1.0 L Tedlar Bag					

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Sample ID: **EFF-1** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-001

Test Code: EPA TO-15 Modified Date Collected: 5/6/15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.0050 Liter(s)
Test Notes: 0.0010 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	100	28	ND	58	16	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	100	34	ND	20	6.9	
74-87-3	Chloromethane	ND	100	30	ND	48	15	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	100	38	ND	14	5.4	
75-01-4	Vinyl Chloride	**910**	100	34	**350**	39	13	
106-99-0	1,3-Butadiene	ND	100	44	ND	45	20	
74-83-9	Bromomethane	ND	100	38	ND	26	9.8	
75-00-3	Chloroethane	ND	100	34	ND	38	13	
64-17-5	Ethanol	ND	1,000	160	ND	530	85	
75-05-8	Acetonitrile	ND	100	36	ND	60	21	
107-02-8	Acrolein	ND	400	34	ND	170	15	
67-64-1	Acetone	ND	1,000	150	ND	420	65	
75-69-4	Trichlorofluoromethane	ND	100	34	ND	18	6.1	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	1,000	84	ND	410	34	
107-13-1	Acrylonitrile	ND	100	34	ND	46	16	
75-35-4	1,1-Dichloroethene	**410**	100	34	**100**	25	8.6	
75-09-2	Methylene Chloride	ND	100	34	ND	29	9.8	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	100	32	ND	32	10	
76-13-1	Trichlorotrifluoroethane	ND	100	34	ND	13	4.4	
75-15-0	Carbon Disulfide	ND	1,000	30	ND	320	9.6	
156-60-5	trans-1,2-Dichloroethene	**520**	100	38	**130**	25	9.6	
75-34-3	1,1-Dichloroethane	**180**	100	32	**45**	25	7.9	
1634-04-4	Methyl tert-Butyl Ether	ND	100	34	ND	28	9.4	
108-05-4	Vinyl Acetate	ND	1,000	130	ND	280	37	
78-93-3	2-Butanone (MEK)	ND	1,000	42	ND	340	14	

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **EFF-1** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-001

Test Code: EPA TO-15 Modified Date Collected: 5/6/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes: 0.0010 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**51,000**	500	160	**13,000**	130	40	**D**
141-78-6	Ethyl Acetate	ND	200	70	ND	56	19	
110-54-3	n-Hexane	ND	100	30	ND	28	8.5	
67-66-3	Chloroform	ND	100	34	ND	20	7.0	
109-99-9	Tetrahydrofuran (THF)	ND	100	40	ND	34	14	
107-06-2	1,2-Dichloroethane	ND	100	32	ND	25	7.9	
71-55-6	1,1,1-Trichloroethane	ND	100	34	ND	18	6.2	
71-43-2	Benzene	ND	100	32	ND	31	10	
56-23-5	Carbon Tetrachloride	ND	100	30	ND	16	4.8	
110-82-7	Cyclohexane	ND	200	58	ND	58	17	
78-87-5	1,2-Dichloropropane	ND	100	32	ND	22	6.9	
75-27-4	Bromodichloromethane	ND	100	30	ND	15	4.5	
79-01-6	Trichloroethene	ND	100	28	ND	19	5.2	
123-91-1	1,4-Dioxane	ND	100	32	ND	28	8.9	
80-62-6	Methyl Methacrylate	ND	200	62	ND	49	15	
142-82-5	n-Heptane	ND	100	34	ND	24	8.3	
10061-01-5	cis-1,3-Dichloropropene	ND	100	28	ND	22	6.2	
108-10-1	4-Methyl-2-pentanone	ND	100	32	ND	24	7.8	
10061-02-6	trans-1,3-Dichloropropene	ND	100	32	ND	22	7.1	
79-00-5	1,1,2-Trichloroethane	ND	100	32	ND	18	5.9	
108-88-3	Toluene	ND	100	34	ND	27	9.0	
591-78-6	2-Hexanone	ND	100	32	ND	24	7.8	
124-48-1	Dibromochloromethane	ND	100	32	ND	12	3.8	
106-93-4	1,2-Dibromoethane	ND	100	32	ND	13	4.2	
123-86-4	n-Butyl Acetate	ND	100	32	ND	21	6.7	

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **EFF-1** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-001

Test Code: EPA TO-15 Modified Date Collected: 5/6/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes: 0.0010 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	100	36	ND	21	7.7	
127-18-4	Tetrachloroethene	ND	100	28	ND	15	4.1	
108-90-7	Chlorobenzene	ND	100	32	ND	22	7.0	
100-41-4	Ethylbenzene	ND	100	32	ND	23	7.4	
179601-23-1	m,p-Xylenes	ND	200	60	ND	46	14	
75-25-2	Bromoform	ND	100	30	ND	9.7	2.9	
100-42-5	Styrene	ND	100	30	ND	23	7.0	
95-47-6	o-Xylene	ND	100	30	ND	23	6.9	
111-84-2	n-Nonane	ND	100	30	ND	19	5.7	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	30	ND	15	4.4	
98-82-8	Cumene	ND	100	30	ND	20	6.1	
80-56-8	alpha-Pinene	**110**	100	28	**19**	18	5.0	
103-65-1	n-Propylbenzene	ND	100	32	ND	20	6.5	
622-96-8	4-Ethyltoluene	ND	100	32	ND	20	6.5	
108-67-8	1,3,5-Trimethylbenzene	ND	100	32	ND	20	6.5	
95-63-6	1,2,4-Trimethylbenzene	ND	100	30	ND	20	6.1	
100-44-7	Benzyl Chloride	ND	100	22	ND	19	4.3	
541-73-1	1,3-Dichlorobenzene	ND	100	30	ND	17	5.0	
106-46-7	1,4-Dichlorobenzene	ND	100	28	ND	17	4.7	
95-50-1	1,2-Dichlorobenzene	ND	100	30	ND	17	5.0	
5989-27-5	d-Limonene	ND	100	28	ND	18	5.0	
96-12-8	1,2-Dibromo-3-chloropropane	ND	100	20	ND	10	2.0	
120-82-1	1,2,4-Trichlorobenzene	ND	100	32	ND	13	4.3	
91-20-3	Naphthalene	ND	100	36	ND	19	6.9	
87-68-3	Hexachlorobutadiene	ND	100	28	ND	9.4	2.6	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Sample ID: **EFF-2** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-002

Test Code: EPA TO-15 Modified Date Collected: 5/6/15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.10 Liter(s)
Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	5.0	1.4	ND	2.9	0.81	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	5.0	1.7	ND	1.0	0.34	
74-87-3	Chloromethane	ND	5.0	1.5	ND	2.4	0.73	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	5.0	1.9	ND	0.72	0.27	
75-01-4	Vinyl Chloride	**960**	5.0	1.7	**380**	2.0	0.67	
106-99-0	1,3-Butadiene	ND	5.0	2.2	ND	2.3	0.99	
74-83-9	Bromomethane	ND	5.0	1.9	ND	1.3	0.49	
75-00-3	Chloroethane	**17**	5.0	1.7	**6.3**	1.9	0.64	
64-17-5	Ethanol	ND	50	8.0	ND	27	4.2	
75-05-8	Acetonitrile	ND	5.0	1.8	ND	3.0	1.1	
107-02-8	Acrolein	ND	20	1.7	ND	8.7	0.74	
67-64-1	Acetone	**7.7**	50	7.7	**3.2**	21	3.2	**J, B**
75-69-4	Trichlorofluoromethane	ND	5.0	1.7	ND	0.89	0.30	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	50	4.2	ND	20	1.7	
107-13-1	Acrylonitrile	ND	5.0	1.7	ND	2.3	0.78	
75-35-4	1,1-Dichloroethene	**15**	5.0	1.7	**3.8**	1.3	0.43	
75-09-2	Methylene Chloride	**6.0**	5.0	1.7	**1.7**	1.4	0.49	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	5.0	1.6	ND	1.6	0.51	
76-13-1	Trichlorotrifluoroethane	ND	5.0	1.7	ND	0.65	0.22	
75-15-0	Carbon Disulfide	ND	50	1.5	ND	16	0.48	
156-60-5	trans-1,2-Dichloroethene	**5.4**	5.0	1.9	**1.4**	1.3	0.48	
75-34-3	1,1-Dichloroethane	ND	5.0	1.6	ND	1.2	0.40	
1634-04-4	Methyl tert-Butyl Ether	ND	5.0	1.7	ND	1.4	0.47	
108-05-4	Vinyl Acetate	ND	50	6.5	ND	14	1.8	
78-93-3	2-Butanone (MEK)	ND	50	2.1	ND	17	0.71	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **EFF-2** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-002

Test Code: EPA TO-15 Modified Date Collected: 5/6/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.10 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**560**	5.0	1.6	**140**	1.3	0.40	
141-78-6	Ethyl Acetate	ND	10	3.5	ND	2.8	0.97	
110-54-3	n-Hexane	ND	5.0	1.5	ND	1.4	0.43	
67-66-3	Chloroform	ND	5.0	1.7	ND	1.0	0.35	
109-99-9	Tetrahydrofuran (THF)	ND	5.0	2.0	ND	1.7	0.68	
107-06-2	1,2-Dichloroethane	ND	5.0	1.6	ND	1.2	0.40	
71-55-6	1,1,1-Trichloroethane	ND	5.0	1.7	ND	0.92	0.31	
71-43-2	Benzene	ND	5.0	1.6	ND	1.6	0.50	
56-23-5	Carbon Tetrachloride	ND	5.0	1.5	ND	0.80	0.24	
110-82-7	Cyclohexane	ND	10	2.9	ND	2.9	0.84	
78-87-5	1,2-Dichloropropane	ND	5.0	1.6	ND	1.1	0.35	
75-27-4	Bromodichloromethane	ND	5.0	1.5	ND	0.75	0.22	
79-01-6	Trichloroethene	ND	5.0	1.4	ND	0.93	0.26	
123-91-1	1,4-Dioxane	ND	5.0	1.6	ND	1.4	0.44	
80-62-6	Methyl Methacrylate	ND	10	3.1	ND	2.4	0.76	
142-82-5	n-Heptane	ND	5.0	1.7	ND	1.2	0.41	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	1.4	ND	1.1	0.31	
108-10-1	4-Methyl-2-pentanone	ND	5.0	1.6	ND	1.2	0.39	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	1.6	ND	1.1	0.35	
79-00-5	1,1,2-Trichloroethane	ND	5.0	1.6	ND	0.92	0.29	
108-88-3	Toluene	**13**	5.0	1.7	**3.4**	1.3	0.45	
591-78-6	2-Hexanone	ND	5.0	1.6	ND	1.2	0.39	
124-48-1	Dibromochloromethane	ND	5.0	1.6	ND	0.59	0.19	
106-93-4	1,2-Dibromoethane	ND	5.0	1.6	ND	0.65	0.21	
123-86-4	n-Butyl Acetate	ND	5.0	1.6	ND	1.1	0.34	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **EFF-2** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P1501859-002

Test Code: EPA TO-15 Modified Date Collected: 5/6/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 5/7/15

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.10 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	5.0	1.8	ND	1.1	0.39	
127-18-4	Tetrachloroethene	ND	5.0	1.4	ND	0.74	0.21	
108-90-7	Chlorobenzene	ND	5.0	1.6	ND	1.1	0.35	
100-41-4	Ethylbenzene	ND	5.0	1.6	ND	1.2	0.37	
179601-23-1	m,p-Xylenes	ND	10	3.0	ND	2.3	0.69	
75-25-2	Bromoform	ND	5.0	1.5	ND	0.48	0.15	
100-42-5	Styrene	ND	5.0	1.5	ND	1.2	0.35	
95-47-6	o-Xylene	ND	5.0	1.5	ND	1.2	0.35	
111-84-2	n-Nonane	**6.1**	5.0	1.5	**1.2**	0.95	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	1.5	ND	0.73	0.22	
98-82-8	Cumene	**11**	5.0	1.5	**2.3**	1.0	0.31	
80-56-8	alpha-Pinene	ND	5.0	1.4	ND	0.90	0.25	
103-65-1	n-Propylbenzene	ND	5.0	1.6	ND	1.0	0.33	
622-96-8	4-Ethyltoluene	ND	5.0	1.6	ND	1.0	0.33	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.6	ND	1.0	0.33	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	1.5	ND	1.0	0.31	
100-44-7	Benzyl Chloride	ND	5.0	1.1	ND	0.97	0.21	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.5	ND	0.83	0.25	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.4	ND	0.83	0.23	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ND	0.83	0.25	
5989-27-5	d-Limonene	ND	5.0	1.4	ND	0.90	0.25	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	0.99	ND	0.52	0.10	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.6	ND	0.67	0.22	
91-20-3	Naphthalene	ND	5.0	1.8	ND	0.95	0.34	
87-68-3	Hexachlorobutadiene	ND	5.0	1.4	ND	0.47	0.13	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **Method Blank** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-MB

Test Code: EPA TO-15 Modified Date Collected: NA

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

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	**1.0**	5.0	0.77	**0.43**	2.1	0.32	**J**
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

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

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

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **Method Blank** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-MB

Test Code: EPA TO-15 Modified Date Collected: NA

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

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**

Client Sample ID: **Method Blank** ALS Project ID: P1501859

Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-MB

Test Code: EPA TO-15 Modified Date Collected: NA

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

Analyst: Simon Cao Date Analyzed: 5/7/15

Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

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

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

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Project ID: P1501859

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date(s) Collected: 5/6/15
Analyst: Simon Cao Date(s) Received: 5/7/15
Sample Type: 1.0 L Tedlar Bag(s) Date(s) Analyzed: 5/7/15
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P150507-MB	**98**	**100**	**97**	70-130	
Lab Control Sample	P150507-LCS	**100**	**99**	**100**	70-130	
EFF-1	P1501859-001	**99**	**96**	**99**	70-130	
EFF-2	P1501859-002	**100**	**96**	**102**	70-130	

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

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-LCS

Test Code: EPA TO-15 Modified Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	200	**199**	**100**	50-128	
75-71-8	Dichlorodifluoromethane (CFC 12)	204	**214**	**105**	66-117	
74-87-3	Chloromethane	198	**223**	**113**	51-133	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	**220**	**107**	65-117	
75-01-4	Vinyl Chloride	202	**224**	**111**	61-127	
106-99-0	1,3-Butadiene	214	**265**	**124**	65-132	
74-83-9	Bromomethane	202	**201**	**100**	62-114	
75-00-3	Chloroethane	202	**223**	**110**	64-122	
64-17-5	Ethanol	1,020	**1090**	**107**	57-131	
75-05-8	Acetonitrile	204	**218**	**107**	52-135	
107-02-8	Acrolein	214	**243**	**114**	64-124	
67-64-1	Acetone	1,080	**1050**	**97**	60-113	
75-69-4	Trichlorofluoromethane	198	**231**	**117**	64-112	**L**
67-63-0	2-Propanol (Isopropyl Alcohol)	420	**474**	**113**	62-129	
107-13-1	Acrylonitrile	208	**223**	**107**	69-133	
75-35-4	1,1-Dichloroethene	214	**239**	**112**	70-114	
75-09-2	Methylene Chloride	216	**233**	**108**	63-103	**L**
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	**238**	**109**	57-135	
76-13-1	Trichlorotrifluoroethane	216	**229**	**106**	69-116	
75-15-0	Carbon Disulfide	196	**238**	**121**	66-118	**L**
156-60-5	trans-1,2-Dichloroethene	212	**240**	**113**	69-123	
75-34-3	1,1-Dichloroethane	208	**231**	**111**	65-118	
1634-04-4	Methyl tert-Butyl Ether	212	**236**	**111**	57-125	
108-05-4	Vinyl Acetate	1,020	**777**	**76**	69-131	
78-93-3	2-Butanone (MEK)	216	**226**	**105**	63-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-LCS

Test Code: EPA TO-15 Modified Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	214	**231**	**108**	69-119	
141-78-6	Ethyl Acetate	428	**488**	**114**	65-129	
110-54-3	n-Hexane	210	**215**	**102**	55-116	
67-66-3	Chloroform	216	**234**	**108**	68-111	
109-99-9	Tetrahydrofuran (THF)	206	**204**	**99**	69-120	
107-06-2	1,2-Dichloroethane	210	**224**	**107**	67-117	
71-55-6	1,1,1-Trichloroethane	208	**228**	**110**	74-116	
71-43-2	Benzene	220	**205**	**93**	61-109	
56-23-5	Carbon Tetrachloride	214	**257**	**120**	76-120	
110-82-7	Cyclohexane	422	**461**	**109**	72-115	
78-87-5	1,2-Dichloropropane	212	**232**	**109**	67-119	
75-27-4	Bromodichloromethane	216	**242**	**112**	78-124	
79-01-6	Trichloroethene	208	**230**	**111**	69-115	
123-91-1	1,4-Dioxane	218	**195**	**89**	69-127	
80-62-6	Methyl Methacrylate	420	**495**	**118**	76-128	
142-82-5	n-Heptane	214	**242**	**113**	66-118	
10061-01-5	cis-1,3-Dichloropropene	226	**266**	**118**	77-124	
108-10-1	4-Methyl-2-pentanone	218	**255**	**117**	66-134	
10061-02-6	trans-1,3-Dichloropropene	216	**254**	**118**	80-130	
79-00-5	1,1,2-Trichloroethane	212	**229**	**108**	75-119	
108-88-3	Toluene	212	**220**	**104**	68-114	
591-78-6	2-Hexanone	222	**226**	**102**	60-136	
124-48-1	Dibromochloromethane	220	**249**	**113**	75-132	
106-93-4	1,2-Dibromoethane	216	**232**	**107**	72-122	
123-86-4	n-Butyl Acetate	224	**266**	**119**	60-137	

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

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450** ALS Sample ID: P150507-LCS

Test Code: EPA TO-15 Modified Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	208	**239**	**115**	66-120	
127-18-4	Tetrachloroethene	198	**214**	**108**	67-120	
108-90-7	Chlorobenzene	216	**227**	**105**	69-114	
100-41-4	Ethylbenzene	212	**234**	**110**	71-117	
179601-23-1	m,p-Xylenes	420	**458**	**109**	71-118	
75-25-2	Bromoform	216	**264**	**122**	76-149	
100-42-5	Styrene	218	**240**	**110**	71-128	
95-47-6	o-Xylene	206	**224**	**109**	72-118	
111-84-2	n-Nonane	204	**219**	**107**	63-123	
79-34-5	1,1,2,2-Tetrachloroethane	202	**228**	**113**	73-124	
98-82-8	Cumene	204	**223**	**109**	71-118	
80-56-8	alpha-Pinene	208	**240**	**115**	71-123	
103-65-1	n-Propylbenzene	202	**222**	**110**	71-120	
622-96-8	4-Ethyltoluene	212	**236**	**111**	71-121	
108-67-8	1,3,5-Trimethylbenzene	212	**224**	**106**	72-121	
95-63-6	1,2,4-Trimethylbenzene	210	**235**	**112**	71-122	
100-44-7	Benzyl Chloride	218	**283**	**130**	79-143	
541-73-1	1,3-Dichlorobenzene	218	**236**	**108**	67-121	
106-46-7	1,4-Dichlorobenzene	212	**215**	**101**	68-121	
95-50-1	1,2-Dichlorobenzene	214	**226**	**106**	68-121	
5989-27-5	d-Limonene	210	**255**	**121**	69-137	
96-12-8	1,2-Dibromo-3-chloropropane	206	**243**	**118**	73-145	
120-82-1	1,2,4-Trichlorobenzene	210	**227**	**108**	60-135	
91-20-3	Naphthalene	196	**223**	**114**	63-142	
87-68-3	Hexachlorobutadiene	214	**232**	**108**	65-127	

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450**

Method Blank Summary

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Lab File ID: 05071503.D
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag(s) Time Analyzed: 06:47
Test Notes:

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P150507-LCS	05071504.D	07:21
EFF-2	P1501859-002	05071514.D	13:13
EFF-1	P1501859-001	05071516.D	14:21
EFF-1 (Dilution)	P1501859-001	05071517.D	14:55

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **AMEC Foster Wheeler Environment & Infrastructure Inc.** ALS Project ID: P1501859
Client Project ID: **CTS of Asheville / 6690-03-9450**

Internal Standard Area and RT Summary

Test Code: EPA TO-15 Modified
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Lab File ID: 05071501.D
Analyst: Simon Cao Date Analyzed: 5/7/15
Sample Type: 1.0 L Tedlar Bag(s) Time Analyzed: 05:40
Test Notes:

		IS1 (BCM)			IS2 (DFB)			IS3 (CBZ)		
		AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	24 Hour Standard	184557		9.04		955139		11.01		362523		15.35	
	Upper Limit	258380		9.37		1337195		11.34		507532		15.68	
	Lower Limit	110734		8.71		573083		10.68		217514		15.02	
	Client Sample ID												
01	Method Blank	188402		9.02		960525		11.00		362064		15.35	
02	Lab Control Sample	209818		9.04		1078563		11.01		405949		15.36	
03	EFF-2	205482		9.02		1044909		11.00		417990		15.35	
04	EFF-1	209646		9.03		1052265		11.00		414727		15.35	
05	EFF-1 (Dilution)	205810		9.02		1036527		11.00		412965		15.35	
06													
07													
08													
09													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the specified limits.