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September 06, 2013

Mr. Tom Blackman
Lockheed Martin Corporation
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Subject: **Letter Report: Additional Indoor Air and Sub-Slab Vapor Monitoring**
Building A Sub-Slab Depressurization (SSD) Shutdown
Middle River Complex

Dear Mr. Blackman: On behalf of Lockheed Martin Corporation (Lockheed Martin), Tetra Tech, Inc. has prepared this letter report following completion of additional indoor air quality (IAQ) and sub-slab vapor (SV) monitoring at Lockheed Martin's Middle River Complex (MRC) in Middle River, Maryland. This report presents the results from the additional indoor air quality and sub-slab vapor sampling performed while the Building A sub-slab vapor depressurization (SSD) system was shut down for repair of a failed blower between March 16 and April 8, 2013. Sampling was performed at areas in and around the plating shop in Building A. The objective of this additional monitoring was to evaluate any potential concentration changes in chemicals of concern (COCs) in indoor air (IA) and sub-slab vapor at and around the Building A plating shop during the non-operational period (March 16-April 8, 2013) by comparing analytical results to those obtained during the February 2013 (Round 14) indoor air–sub-slab vapor monitoring event, while the sub-slab vapor depressurization system was still operational. Specifically, the data were evaluated to determine whether rebound (i.e., increases in concentration following cessation of sub-slab vapor depressurization system operation) was occurring in sub-slab vapor and possibly indoor air.

Sample Locations

Samples collected in March 2013 during the sub-slab vapor depressurization system shutdown were identified by an "A" suffix after the round number (i.e., -R14A) to differentiate these samples from the scheduled February sampling round (Round 14). Nine indoor air samples plus one duplicate, and four sub-slab vapor samples plus one duplicate were collected from locations at and around the Building A plating shop (Figure 1). The sampling rationale included locations within the Building A sub-slab vapor depressurization radius of influence (ROI) for both sub-slab vapor and indoor air, as well as test locations beyond the radius of influence for indoor air only, since vapors might have migrated beyond the areas near locations with elevated sub-slab vapor concentrations. Locations beyond the radius of influence that have previously shown elevated indoor air trichloroethene (TCE) concentrations (although not above the screening level) were also included.

Indoor air and co-located sub-slab vapor samples were collected at four locations within the Building A sub-slab vapor depressurization system radius of influence. These locations were:

- 015-A in the plating shop,
- 108-A in the room east of the plating shop,
- 118-A in the bond layup room, and
- 018-A in the Building A basement.

Five indoor air samples, with no co-located sub-slab vapor samples, were collected outside the Building A sub-slab vapor depressurization system radius of influence. The sample locations and their rationale are as follows:

Sample ID	Location	Rationale
093-A	southern part of basement	location with the highest indoor air trichloroethene (TCE) concentration (6.3 µg/m^3) in Round 14.

138-A	basement, south of the sub-slab vapor depressurization (SSD) radius of influence (ROI)	location with the second highest indoor air TCE concentration (4.5 µg/m^3) in Round 14.
116-A	basement 27-feet north of the SSD ROI	delineate volatile organic compound (VOC) concentrations immediately outside the radius of influence during the shutdown period.
079-A	west of the plating shop	elevated sub-slab vapor TCE concentrations detected at this location since installation in June 2009.
076-A	north of the plating shop	possible northern extent of TCE; low concentrations of TCE (1.3 J µg/m^3) were found in indoor air during Round 14.

Sampling and Analysis

Sampling was performed in accordance with the methods described in the *IAQ Assessment Work Plan* (Tetra Tech, 2006) and the *Work Plan Addendum, Indoor Air and Sub-Slab Sampling Round 14* (Tetra Tech, 2013). Indoor air quality and sub-slab sampling and analysis were performed in accordance with USEPA Method Toxic Organic 15 (TO-15) for collection and analysis of volatile organic compounds (VOCs) (USEPA, 1999). Sub-slab soil vapor samples were likewise collected in accordance with standard operating procedures developed by the USEPA Environmental Response Team for soil vapor sampling (USEPA, 1996), as well as in accordance with methodologies developed by the USEPA Office of Research and Development (USEPA, 2004). Indoor air quality samples were collected over a seven- to eight-hour period, while sub-slab vapor samples were collected over a one-hour period.

All samples were analyzed for the current list of chemicals of concern for vapor intrusion monitoring at the Middle River Complex:

- benzene
- carbon tetrachloride
- chlorodifluoromethane (Freon 22)
- chloroform
- dichlorodifluoromethane
- 1,1-dichloroethane (1,1-DCA)
- 1,2-dichloroethane (1,2-DCA)
- naphthalene
- tetrachloroethene (PCE)
- toluene
- 1,2,4-trichlorobenzene
- 1,1,1-trichloroethane (1,1,1-TCA)
- 1,2,3-trimethylbenzene (1,2,3-TMB)
- 1,2,4-trimethylbenzene (1,2,4-TMB)

- 1,1-dichloroethene (1,1-DCE)
- *cis*-1,2-dichloroethene (*cis*-1,2-DCE)
- *trans*-1,2-dichloroethene (*trans*-1,2-DCE)
- Ethylbenzene
- methyl-tertiary-butyl ether (MTBE)
- methylene chloride
- 1,3,5-trimethylbenzene (1,3,5-TMB)
- trichloroethene (TCE)
- 1,1,2-trichloroethane (1,1,2-TCA)
- vinyl chloride (VC)
- xylenes (total)

All samples were submitted to Centek Laboratories, Limited Liability Company (Centek) in Syracuse, New York for analysis by gas chromatography/mass spectroscopy with cryogenic concentration (as described in Sections 9 and 10 of USEPA Method TO-15 [USEPA, 1999]). Centek is certified in USEPA Method TO-15 analysis and meets all quality assurance/quality control requirements specified in the TO-15 methodology. All samples were stored at ambient temperatures and shipped via overnight carrier to the laboratory. All samples were submitted and analyzed within the method's specified holding time of 30 days. All appropriate chain of custody documentation was completed for each sample (see Appendix A).

Data validation reports and supporting documentation are in Appendix A. Analytical data were qualified (e.g., *U, B, E, J,* or *K* qualifiers) in accordance with USEPA *Contract Laboratory Program National Functional Guidelines* (USEPA, 2008). Attaching data qualifiers to analytical results signifies a quality control non-compliance. After validation, the following qualifiers were assigned to non-conforming data (i.e., data affected by technical limitations during laboratory analysis):

- *J* indicating an estimated result where the result was less than the reporting limit
- *U* indicating the chemical was not detected at the numerical detection limit (sample-specific quantitation limit)

Data Analysis

The analytical results for the additional indoor air and sub-slab vapor samples collected in March 2013 at and around the Building A plating shop are included in Tables 1, 2, 3, and 4. Table 1 illustrates the March 2013 indoor air results, and Table 2 compares March 2013 results with February 2013 indoor air results from the same locations. Duplicate indoor air results (for sample locations 018-A and 108-A) and averaged concentrations of the original sample and the duplicate are also included in these tables. Table 3 illustrates the March 2013 sub-slab vapor results, while

Table 4 compares March 2013 sub-slab vapor results to February 2013 sub-slab vapor results from the same locations. The comparisons between March and February 2013 indoor air and sub-slab vapor results were performed to evaluate possible increases (rebound) in indoor air or sub-slab vapor while the sub-slab vapor depressurization system was not operating. Tables 2 and 4 contain calculations of the percent change in concentration measured during the February and March 2013 events. If both sample results were U-flagged, then the percent change was listed as 0%, but if only one of the results was U-flagged, then the percent change was listed as "N/A".

Specific chemicals known to be associated with sub-slab vapor at the Middle River Complex (i.e., trichloroethene [TCE], *cis*-1,2-dichloroethene [*cis*-1,2-DCE], and 1,1-dichloroethene [1,1-DCE]) were used as indicators of possible rebound and vapor intrusion.

Indoor air quality-monitoring analytical results for all compounds except 1,2,3- and 1,2,4,-trimethylbenzene were compared to screening levels for industrial air set forth in the USEPA's *Regional Screening Levels for Chemical Contaminants at Superfund Sites* (USEPA, 2012). The lowest of the carcinogenic (*ca*) or noncarcinogenic (*nc*) values for each chemical of concern were used for the screening. Carcinogenic risk was evaluated at the 1×10^{-5} (one in 100,000) risk level, in accordance with Maryland Department of the Environment requirements. 1,2,3- and 1,2,4-Trimethylbenzene were compared to their respective American Council of Governmental Industrial Hygienists "Threshold Limit Values."

Sub-slab vapor monitoring results were compared to sub-slab vapor screening values derived in accordance with methods discussed in Appendix D of USEPA's guidance for evaluating vapor intrusion (USEPA, 2002): sub-slab vapor screening values were calculated by dividing the indoor-air screening levels by USEPA's recommended attenuation factor (AF) of 0.03 (USEPA, 2013). Figure 1 illustrates locations where chemicals of concern concentrations exceeded screening levels. A review of the results indicated the following:

<u>Indoor Air</u>

- No chemical of concern exceeded its applicable screening level in indoor air
- The greatest increases in indoor air trichloroethene (TCE) concentration from February to March 2013 were seen at the following locations:
    - 015-A ($0.36U$–1.8 µg/m^3)

- 076-A (1.3 *J*-7.6 *J* µg/m^3)
- 079-A (0.36*U*-8.2 µg/m^3)
- 108-A (0.79 J [average with duplicate]-5.6 µg/m^3)

- Reductions in indoor air trichloroethene (TCE) concentration from February to March 2013 were seen at the following locations:
  - 093-A (6.3-1.2 µg/m^3)
  - 138-A (4.5-2.7 µg/m^3

- The remaining two locations sampled during both events (018-A and 118-A) showed only small changes in the concentration of trichloroethene (TCE) (location 116-A was not sampled in February 2013).

- Increases in the indoor air concentration of *cis*-1,2-dichloroethene (*cis*-1,2-DCE) [a indicator of potential vapor intrusion] from February to March 2013 were seen at the following locations:
  - 015-A (0.19*U*-0.48*J* µg/m^3)
  - 018-A (0.19 *U*-0.48*J* µg/m^3 [average with duplicate])
  - 076-A (0.19*U*-1.8 µg/m^3)
  - 079-A (0.19*U*-0.85 µg/m^3)
  - 108-A (0.19*U*-0.64 µg/m^3)

- Sample location 018-A had an indoor air *cis*-1,2-dichloroethene (*cis*-1,2-DCE) concentration of 0.48 *J* µg/m^3 during the March event; however, its duplicate was reported as not-detected (0.6*U* µg/m^3). The February result for *cis*-1,2-DCE at this location was reported as not-detected (0.19*U* µg/m^3).

- Increases in indoor air trichloroethene (TCE) concentrations (from February to March 2013) were observed where increases in *cis*-1,2-dichloroethene (*cis*-1,2-DCE) were found.

- *cis*-1,2-Dichloroethene (*cis*-1,2-DCE) concentrations in the remaining samples were reported as not detected in both sampling events.

- Increases in indoor air concentrations of 1,1-dichloroethene (1,1-DCE) from February to March 2013 were seen at the following locations:
  - 018-A (0.85-1.4 µg/m^3[average with duplicate])
  - 076-A (0.22*U*-8.1 µg/m^3)

- 079-A (0.22*U*-4.5 µg/m^3)
- 118-A (0.22*U*-4.2 µg/m^3)

- Reductions in indoor air 1,1-dichloroethene (1,1-DCE) concentrations from February to March 2013 were seen at the same locations where indoor air trichloroethene (TCE) reductions were found:
  - 093-A (0.89-0.22*U* µg/m^3)
  - 138-A (0.93-0.22*U* µg/m^3)
- Other chemicals of concern that predominantly increased in indoor air from February to March 2013 included:
  - Chlorodifluoromethane increased in eight of eight locations listed below:
    - 015-A (0.18*U*-1.2 µg/m^3)
    - 018-A (0.18*U*-0.985 µg/m^3[average with duplicate])
    - 076-A (0.18*U*-2.7 µg/m^3)
    - 079-A (0.18*U*-2.2 µg/m^3)
    - 093-A (0.18*U*-2.5 µg/m^3)
    - 108-A (0.18*U*-1.5 µg/m^3)
    - 118-A (0.18*U*-7.2 µg/m^3)
    - 138-A (0.18*U*-0.93 µg/m^3)
  - Methylene chloride increased at five of eight locations, decreased at one of eight and remained relatively unchanged at two of eight locations. Increases are listed below:
    - 015-A (1-24 µg/m^3)
    - 018-A (0.36-0.87 µg/m^3[average with duplicate])
    - 093-A (0.53-3. µg/m^3)
    - 118-A (0.74-1.4 µg/m^3)
    - 138-A (0.14-1.1 µg/m^3)
  - Naphthalene did not show notable changes in concentration between February and March.

<u>Sub-Slab Vapor</u>

- Trichloroethene (TCE) exceeded its sub-slab vapor screening level (293 µg/m^3) in all four sub-slab vapor samples (and the duplicate sample) collected in March 2013.

- Sub-slab vapor trichloroethene (TCE) concentrations increased from February to March 2013 at the following locations:

  - 015-A (710- 8,800 µg/m^3)

  - 108-A (590 [average with duplicate]-1,800 µg/m^3)

  - 118-A (5,100-17,000 µg/m^3)

- Sample location 018-A had a sub-slab vapor trichloroethene (TCE) concentration of 52,000*J* µg/m^3, with a duplicate result of 96,000 µg/m^3 during the March monitoring round. The February TCE concentration was 95,000 µg/m^3, which lies between the March original and its duplicate.

- Increases in the sub-slab vapor concentration of *cis*-1,2-Dichloroethene (*cis*-1,2-DCE) from February to March 2013 were seen at all four locations:

  - 015-A (1,300-7,000 µg/m^3)

  - 018-A (3,800-4,800 µg/m^3 [average with duplicate])

  - 108-A (330-780 µg/m^3)

  - 118-A (410*J*-1,100 µg/m^3)

- Increases in sub-slab vapor trichloroethene (TCE) concentrations are where increases in *cis*-1,2-Dichloroethene (*cis*-1,2-DCE) were found.

- Increases in the sub-slab vapor concentration of 1,1-dichloroethene (1,1-DCE) from February 2013 to March 2013 were seen at the following locations:

  - 015-A (490-3,100 µg/m^3)

  - 108-A (3,850 [average with duplicate]-9,500 µg/m^3)

  - 118-A (1,100-5,200 µg/m^3)

- For 1,1-Dichloroethene (1,1-DCE): location 018-A's March sample (37,000*J* µg/m^3) and its duplicate (67,000 µg/m^3) both exceeded the screening level (29,333 µg/m^3). The February concentration of 1,1-DCE was 54,000 µg/m^3.

- Increases in 1,1-Dichloroethene (1,1-DCE) are in the same locations where increases in trichloroethene (TCE) and *cis*-1,2-Dichloroethene (*cis*-1,2-DCE) sub-slab vapor concentrations were found.

- Sub-slab vapor chloroform was detected above its screening level (177 µg/m^3) at March sample location 118-A (280 µg/m^3), a concentration over three times higher than its concentration in February (55 µg/m^3).

- 1,1-Dichloroethane (1,1-DCA) had a March exceedance (8,300 µg/m^3) of its screening level (2,567 µg/m^3) at location 108-A. The February concentration in the duplicate sample at this location was also an exceedance (4,100 µg/m^3), but the original February sample had a concentration (2,000*J* µg/m^3) which was below the screening level.

- Other chemicals of concern that predominantly increased in sub-slab vapor from February to March 2013 included:

  - Chlorodifluoromethane increased in two of four locations and remained relatively unchanged at two of four locations. Increases are listed below:

    - 015-A (0.18*U*-0.93 µg/m^3)

    - 118-A (0.18*U*-3.9 µg/m^3)

  - Toluene increased in four of four locations. Increases are listed below:

    - 015-A (14-160 µg/m^3)

    - 018-A (4.1-59 µg/m^3[average with duplicate])

    - 108-A (6.1[average with duplicate]-64 µg/m^3)

    - 118-A (8-37 µg/m^3)

  - 1,1,1-Trichloroethane increased in three of four locations and remained relatively unchanged at one location. Increases are listed below:

    - 015-A (140-460 µg/m^3)

    - 108-A (175[average with duplicate]-360 µg/m^3)

    - 118-A (29-340 µg/m^3)

  - 1,2,4-Trimethylbenzene increased in two of four locations, decreased at one location and remained relatively unchanged at one location. Increases are listed below:

    - 015-A (0.84-1.3 µg/m^3)

    - 018-A (0.48 [average with duplicate]-0.85 µg/m^3)

Summary and Conclusions

Tetra Tech has completed additional indoor air quality and sub-slab vapor monitoring at Lockheed Martin's Middle River Complex located in Middle River, Maryland. The ongoing

vapor intrusion (VI) investigation seeks to evaluate whether volatile organic compounds (VOCs) in sub-slab vapors (associated with soil and groundwater chemicals of concern [COC] at the site) might be migrating into indoor air at site facilities. Additional indoor air and sub-slab vapor sampling was performed while the Building A sub-slab depressurization system was shut down between March 16 and April 8, 2013 to repair a blower failure.

The objective of this additional monitoring was to evaluate any potential changes in chemicals of concern in indoor air and sub-slab vapor at and around the Building A plating shop during the non-operational period, by comparing March 2013 analytical results to those obtained during the normally scheduled February 2013 (Round 14) monitoring event, while the sub-slab depressurization system was still operational. Sampling was performed at areas in and around the plating shop in Building A. The data set used for comparison to March 2013 data is comprised of indoor air and sub-slab vapor samples collected from the same locations in February 2013. All data were validated to ensure compliance with analytical method requirements. Results of the additional indoor air quality/sub-slab vapor samples led to the following conclusions:

- No indoor air concentrations of any chemicals of concern exceeded screening levels therefore, it appears that personnel were not exposed to concentrations of chemicals of concern that might pose potential risks while the system was shut down.

- Increased indoor air concentrations of trichloroethene (TCE), *cis*-1,2-Dichloroethene (*cis*-1,2-DCE), and 1,1-Dichloroethene (1,1-DCE) were detected (from February to March 2013) at locations both within and outside of the sub-slab depressurization (SSD) system radius of influence (ROI).

- Locations with increases in indoor air trichloroethene (TCE) also had increases in *cis*-1,2-Dichloroethene (*cis*-1,2-DCE). Similarly, locations with TCE concentration decreases in indoor air are the same locations where reductions in 1,1-Dichloroethene (1,1-DCE) were found.

- Trichloroethene (TCE) exceeded its sub-slab vapor screening level at all four sample locations (and in the duplicate sample). 1,1-Dichloroethene (1,1-DCE) exceeded its sub-slab vapor screening level at three of four sample locations, and 1,1-dichloroethane (1,1-DCA) and chloroform exceeded their respective sub-slab vapor screening levels at one location each.

- Rebound concentrations of trichloroethene (TCE), *cis*-1,2-Dichloroethene (*cis*-1,2-DCE) and 1,1-Dichloroethene (1,1-DCE) were observed in sub-slab vapor collected from the four locations within the sub-slab depressurization system radius of influence.

- Increased concentrations of chemicals of concern in indoor air (trichloroethene [TCE], *cis*-1,2-Dichloroethene [*cis*-1,2-DCE] and 1,1-Dichloroethene [1,1-DCE]) are believed to be associated with the rebound of these chemicals of concern in sub-slab vapor during sub-slab depressurization system shutdown, and is an indication of the potential for vapor intrusion. While none of the indoor air samples exceeded the trichloroethene (TCE) screening value of 8.8 $\mu g/m^3$, the detected concentrations were approaching this value, suggesting that active vapor mitigation within Building A remains appropriate.

- The sub-slab depressurization system is effectively controlling sub-slab vapor migration, and indoor air contaminant concentrations within its area of influence, and operation of the system should continue.

Sincerely,

Michael Martin
Program Manager
Tetra Tech, Inc.

Attachment: Tables 1-4, Figure 1, Appendix A

cc:

REFERENCES

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6. USEPA (United States Environmental Protection Agency), 2004. *Sub-Slab Sampling and Analysis to Support Assessment of Vapor Intrusion*. United States Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Groundwater and Ecosystem Restoration Division. Ada, Oklahoma. May.

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TABLES

TABLE 1
MARCH 2013 INDOOR AIR RESULTS
LOCKHEED MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND
PAGE 1 of 2

SAMPLE ID SAMPLE DATE	OSHA PEL (µg/m3)	Industrial Air Screening Level (µg/m3)	KEY	IA-015-A-14A 28-Mar-13	IA-018-A-14A 27-Mar-13	IA-018-A-14A-D 27-Mar-13	IA-076-A-14A 28-Mar-13
				015-A	018-A		076-A
Volatile Organic Compounds (µg/m^3)							
BENZENE	319	16	ca	1.1	0.58	0.55	0.62
CARBON TETRACHLORIDE	62,900	20	ca	0.36 U	0.36 U	0.36 U	0.36 U
CHLORODIFLUOROMETHANE	3,590,000	220,000	nc	1.2	0.97	1	2.7
CHLOROFORM	240,000	5.3	ca	0.2 U	0.2 U	0.2 U	0.5 J
DICHLORODIFLUOROMETHANE	4,950,000	440	nc	2.4	2.7	2.8	2.5
1,1-DICHLOROETHANE	400,000	77	ca	0.22 U	0.22 U	0.22 U	0.82
1,2-DICHLOROETHANE	400,000	4.7	ca	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	NA	880	nc	0.22 U	1.5	1.3	8.1
CIS-1,2-DICHLOROETHENE	790,000	---	----	0.48 J	0.48 J	0.19 U	1.8
TRANS-1,2-DICHLOROETHENE	790,000	260	nc	0.19 U	0.19 U	0.19 U	0.19 U
ETHYLBENZENE	435,000	49	ca	4.4	0.19 U	0.19 U	2.4
METHYL TERT-BUTYL ETHER	180,000 [A]	470	ca	0.24 U	0.24 U	0.24 U	0.24 U
METHYLENE CHLORIDE	87,000	2,600	nc	24	0.99	0.74	1.3
NAPHTHALENE	50,000	3.6	ca	0.25 U	1	1.3	1.2
TETRACHLOROETHENE	678,000	180	nc	0.39 U	0.39 U	0.39 U	0.39 U
TOLUENE	754,000	22,000	nc	99	57 J	22 J	70
1,2,4-TRICHLOROBENZENE	40,000 [N]	8.8	nc	0.45 U	0.45 U	0.45 U	0.45 U
1,1,1-TRICHLOROETHANE	1,900,000	22,000	nc	0.27 U	0.27 U	0.27 U	0.27 U
1,1,2-TRICHLOROETHANE	45,000	0.88	nc	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROETHENE	537,000	8.8	nc	1.8	3.3	2.7	7.6 J
1,2,3-TRIMETHYLBENZENE	123,000	22	nc	0.18 U	0.18 U	0.18 U	0.18 U
1,2,4-TRIMETHYLBENZENE	123,000	31	nc	0.85	0.23 U	0.23 U	0.5 J
1,3,5-TRIMETHYLBENZENE	123,000	---	---	0.18 U	0.18 U	0.18 U	0.18 U
VINYL CHLORIDE	21,560	28	ca	0.21 U	0.21 U	0.21 U	0.21 U
M+P-XYLENES	434000	440	nc	17	1.5	0.66 J	14
O-XYLENE	434000	440	nc	8.7	0.19 U	0.19 U	4.8
TOTAL XYLENES	434000	440	nc	25.7	1.5	0.66 J	18.8

-14A = sample collected during sub-slab depressurization system shutdown (March 2013)
Shaded cells indicate a concentration greater than the risk -based screening level

-- = not available
J = estimated value
U = not detected
USEPA = United States Environmental Protection Agency

TOTAL XYLENES values are calculated.

ca = screening value based on 1x 10^{-5} carcinogenic risk
nc = screening value based on noncarcinogenic hazard index = 1
A = American Council of Governmental Industrial Hygienists Theshold Limit Value
N = National institute for Occupational Safety and Health Recommended Expoesure Limit
OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit Levels for Chemical Contaminants at Superfund Sites Nov-2012

TABLE 1
MARCH 2013 INDOOR AIR RESULTS
LOCKHEED MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND
PAGE 2 of 2

SAMPLE ID SAMPLE DATE	OSHA PEL (µg/m3)	Industrial Air Screening Level (µg/m3)	KEY	IA-079-A-14A 28-Mar-13 079-A	IA-093-A-14A 27-Mar-13 093-A	IA-108-A-14A 28-Mar-13 108-A	IA-116-A-14A 27-Mar-13 116-A	IA-118-A-14A 28-Mar-13 118-A	IA-138-A-14A 27-Mar-13 138-A
Volatile Organic Compounds (µg/m^3)									
BENZENE	319	16	ca	0.75	0.62	2.5	0.49	0.65	1.2
CARBON TETRACHLORIDE	62,900	20	ca	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
CHLORODIFLUOROMETHANE	3,590,000	220,000	nc	2.2	2.5	1.5	0.97	7.2	0.93
CHLOROFORM	240,000	5.3	ca	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DICHLORODIFLUOROMETHANE	4,950,000	440	nc	2.5	2.9	2.5	2.7	2.4	2.5
1,1-DICHLOROETHANE	400,000	77	ca	1.4	0.22 U	0.22 U	0.22 U	2.8	0.22 U
1,2-DICHLOROETHANE	400,000	4.7	ca	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	NA	880	nc	4.5	0.22 U	0.22 U	0.22 U	4.2	0.22 U
CIS-1,2-DICHLOROETHENE	790,000	---	----	0.85	0.19 U	0.64	0.19 U	0.19 U	0.19 U
TRANS-1,2-DICHLOROETHENE	790,000	260	nc	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ETHYLBENZENE	435,000	49	ca	1.3	0.19 U	4.6	0.19 U	1.5	0.19 U
METHYL TERT-BUTYL ETHER	180,000 [A]	470	ca	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
METHYLENE CHLORIDE	87,000	2,600	nc	0.99	3.1	2.2	0.85	1.4	1.1
NAPHTHALENE	50,000	3.6	ca	0.25 U	0.69 J	0.64 J	0.25 U	0.25 U	0.25 U
TETRACHLOROETHENE	678,000	180	nc	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
TOLUENE	754,000	22,000	nc	38	41	100	50	40	50
1,2,4-TRICHLOROBENZENE	40,000 [N]	8.8	nc	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
1,1,1-TRICHLOROETHANE	1,900,000	22,000	nc	0.27 U	0.27 U	0.27 U	0.27 U	1	0.27 U
1,1,2-TRICHLOROETHANE	45,000	0.88	nc	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROETHENE	537,000	8.8	nc	8.2	1.2	5.6	0.71 J	2.9	2.7
1,2,3-TRIMETHYLBENZENE	123,000	22	nc	0.18 U	0.18 U	0.8	0.18 U	0.18 U	0.18 U
1,2,4-TRIMETHYLBENZENE	123,000	31	nc	0.6 J	0.8	2.6	0.8	0.6 J	0.23 U
1,3,5-TRIMETHYLBENZENE	123,000	---	---	0.18 U	0.18 U	0.65 J	0.18 U	0.18 U	0.18 U
VINYL CHLORIDE	21,560	28	ca	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
M+P-XYLENES	434000	440	nc	9.4	1.3	19	1.1 J	8.7	1 J
O-XYLENE	434000	440	nc	2.4	0.19 U	9	0.19 U	2.1	0.19 U
TOTAL XYLENES	434000	440	nc	11.8	1.3	28	1.1 J	10.8	1 J

-14A = sample collected during sub-slab depressurization system shutdown (March 2013)
Shaded cells indicate a concentration greater than the risk -based screening level

-- = not available
J = estimated value
U = not detected
USEPA = United States Environmental Protection Agency

TOTAL XYLENES values are calculated.

ca = screening value based on 1x 10^{-5} carcinogenic risk
nc = screening value based on noncarcinogenic hazard index = 1
A = American Council of Governmental Industrial Hygienists Theshold Limit Value
N = National Institute for Occupational Safety and Health Recommended Exposure Limit
OSHA PEL = Occupational Safety and Health Administration Pemissible Exposure Limit
Industrial Air Screening Levels from USEPA Regional Screening Levels for Chemical Contaminants at Superfund Sites Nov-2012

TABLE 2
FEBRUARY 2013 AND MARCH 2013 INDOOR AIR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	OSHA PEL (µg/m3)	Industrial Air Screening Level (µg/m3)	KEY	IAQ-015-A-14 5-Feb-13 015-A	IA-015-A-14A 20130328 015-A	% change	IAQ-018-A-14- 5-Feb-13 018-A Avg	IA-018-A-14A-AVG 27-Mar-13 018-A Avg	% change	IAQ-076-A-14 5-Feb-13 076-A	IA-076-A-14A 28-Mar-13 076-A	% change
Volatile Organic Compounds (µg/m^3)												
BENZENE	319	16	ca	0.78 J	1.1	41%	0.99	0.565	-43%	1.1 J	0.62	-44%
CARBON TETRACHLORIDE	62,900	20	ca	0.36 U	0.36 U	0%	0.44	0.36 U	N/A	0.36 U	0.36 U	0%
CHLORODIFLUOROMETHANE	3,590,000	220,000	nc	0.18 U	1.2	N/A	0.18 U	0.985	N/A	0.18 U	2.7	N/A
CHLOROFORM	240,000	5.3	ca	0.2 U	0.2 U	0%	0.6	0.2 U	N/A	0.2 U	0.5 J	N/A
DICHLORODIFLUOROMETHANE	4,950,000	440	nc	2.7	2.4	-11%	3.05	2.75	-10%	2.6	2.5	-4%
1,1-DICHLOROETHANE	400,000	77	ca	0.22 U	0.22 U	0%	0.22 U	0.22 U	0%	0.22 U	0.82	N/A
1,2-DICHLOROETHANE	400,000	4.7	ca	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
1,1-DICHLOROETHENE	NA	880	nc	0.22 U	0.22 U	0%	0.85	1.4	65%	0.22 U	8.1	N/A
CIS-1,2-DICHLOROETHENE	790,000	---	----	0.19 U	0.48 J	N/A	0.19 U	0.2875	N/A	0.19 U	1.8	N/A
TRANS-1,2-DICHLOROETHENE	790,000	260	nc	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%
ETHYLBENZENE	435,000	49	ca	3.6 J	4.4	22%	0.19 U	0.19 U	0%	3.7 J	2.4	-35%
METHYL TERT-BUTYL ETHER	180,000 [A]	470	ca	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%
METHYLENE CHLORIDE	87,000	2,600	ca	1	24	2300%	0.335	0.865	158%	1.1	1.3	18%
NAPHTHALENE	50,000	3.6	ca	0.53 J	0.25 U	N/A	0.9125	1.15	26%	2.9 J	1.2	-59%
TETRACHLOROETHENE	678,000	180	nc	0.39 U	0.39 U	0%	0.39 U	0.39 U	0%	0.39 U	0.39 U	0%
TOLUENE	754,000	22,000	nc	200	99	-51%	1.65	39.5	2294%	180	70	-61%
1,2,4-TRICHLOROBENZENE	40,000 [N]	8.8	nc	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%
1,1,1-TRICHLOROETHANE	1,900,000	22,000	nc	0.27 U	0.27 U	0%	0.27 U	0.27 U	0%	0.27 U	0.27 U	0%
1,1,2-TRICHLOROETHANE	45,000	0.88	nc	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
TRICHLOROETHENE	537,000	8.8	nc	0.36 U	1.8	N/A	2.9	3	3%	1.3 J	7.6 J	485%
1,2,3-TRIMETHYLBENZENE	123,000	22	nc	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%
1,2,4-TRIMETHYLBENZENE	123,000	31	nc	0.55 J	0.85	55%	0.3325	0.23 U	N/A	1.7 J	0.5 J	-71%
1,3,5-TRIMETHYLBENZENE	123,000	---	---	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%	0.55 J	0.18 U	N/A
VINYL CHLORIDE	21,560	28	ca	0.21 U	0.21 U	0%	0.21 U	0.21 U	0%	0.21 U	0.21 U	0%
M+P-XYLENES	434000	440	nc	16 J	17	6%	0.725	1.08	49%	15 J	14	-7%
O-XYLENE	434000	440	nc	5.5 J	8.7	58%	0.19 U	0.19 U	0%	3.6 J	4.8	33%
TOTAL XYLENES	434000	440	nc	21.5 J	25.7	20%	0.725	1.08	49%	18.6 J	18.8	1%

-14 = sample collected during Round 14 (February 2013)
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Shaded cells indicate a concentration greater than the risk -based screening level
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J = estimated value
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USEPA = United States Environmental Protection Agency
TOTAL XYELENES values are calculated.

ca = screening value based on 1x 10^{-5} carcinogenic risk
nc = screening value based on noncarcinogenic hazard index = 1
A = American Council of Governmental Industrial Hygienists Theshold Limit Value
N = National Institute for Occupational Safety and Health Recommended Exposure Limit
OSHA PEL = Occupational Safety and Health Administration Pemissible Exposure Limit
Industrial Air Screening Levels from USEPA Regional Screening Levels for Chemical Chemical Contaminants mat Superfund Sites Nov-2012
Avg - Average

TABLE 2
FEBRUARY 2013 AND MARCH 2013 INDOOR AIR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	OSHA PEL (µg/m3)	Industrial Air Screening Level (µg/m3)	KEY	IAQ-079-A-14 5-Feb-13 079-A	IA-079-A-14A 28-Mar-13 079-A	% change	IAQ-093-A-14 5-Feb-13 093-A	IA-093-A-14A 27-Mar-13 093-A	% change	IAQ-108-A-14- 5-Feb-13 108-A Avg	IA-108-A-14A 28-Mar-13 108-A	% change
Volatile Organic Compounds (µg/m^3)												
BENZENE	319	16	ca	1 J	0.75	-25%	0.81	0.62	-23%	1.005	2.5	149%
CARBON TETRACHLORIDE	62,900	20	ca	0.36 U	0.36 U	0%	0.36 U	0.36 U	0%	0.41	0.36 U	N/A
CHLORODIFLUOROMETHANE	3,590,000	220,000	nc	0.18 U	2.2	N/A	0.18 U	2.5	N/A	0.18 U	1.5	N/A
CHLOROFORM	240,000	5.3	ca	0.6 J	0.2 U	N/A	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
DICHLORODIFLUOROMETHANE	4,950,000	440	nc	2.9	2.5	-14%	2.8	2.9	4%	2.95	2.5	-15%
1,1-DICHLOROETHANE	400,000	77	ca	0.22 U	1.4	N/A	0.22 U	0.22 U	0%	0.22 U	0.22 U	0%
1,2-DICHLOROETHANE	400,000	4.7	ca	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
1,1-DICHLOROETHENE	NA	880	nc	0.22 U	4.5	N/A	0.89	0.22 U	N/A	0.22 U	0.22 U	0%
CIS-1,2-DICHLOROETHENE	790,000	---	----	0.19 U	0.85	N/A	0.19 U	0.19 U	0%	0.19 U	0.64	N/A
TRANS-1,2-DICHLOROETHENE	790,000	260	nc	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%
ETHYLBENZENE	435,000	49	ca	3.9 J	1.3	-67%	0.19 U	0.19 U	0%	2.45	4.6	88%
METHYL TERT-BUTYL ETHER	180,000 [A]	470	ca	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%
METHYLENE CHLORIDE	87,000	2,600	ca	1.4	0.99	-29%	0.53	3.1	485%	1.175	2.2	87%
NAPHTHALENE	50,000	3.6	ca	0.85 J	0.25 U	N/A	0.64 J	0.69 J	8%	0.25 U	0.64 J	N/A
TETRACHLOROETHENE	678,000	180	nc	0.39 U	0.39 U	0%	0.39 U	0.39 U	0%	0.39 U	0.39 U	0%
TOLUENE	754,000	22,000	nc	340	38	-89%	3.3	41	1142%	145	100	-31%
1,2,4-TRICHLOROBENZENE	40,000 [N]	8.8	nc	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%
1,1,1-TRICHLOROETHANE	1,900,000	22,000	nc	0.27 U	0.27 U	0%	0.27 U	0.27 U	0%	0.27 U	0.27 U	0%
1,1,2-TRICHLOROETHANE	45,000	0.88	nc	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
TRICHLOROETHENE	537,000	8.8	nc	0.36 U	8.2	N/A	6.3	1.2	-81%	0.79	5.6	609%
1,2,3-TRIMETHYLBENZENE	123,000	22	nc	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%	0.18 U	0.8	N/A
1,2,4-TRIMETHYLBENZENE	123,000	31	nc	1.1 J	0.6 J	-45%	0.23 U	0.8	N/A	0.675	2.6	285%
1,3,5-TRIMETHYLBENZENE	123,000	---	---	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%	0.18 U	0.65 J	N/A
VINYL CHLORIDE	21,560	28	ca	0.21 U	0.21 U	0%	0.21 U	0.21 U	0%	0.21 U	0.21 U	0%
M+P-XYLENES	434000	440	nc	19 J	9.4	-51%	0.84 J	1.3	55%	13	19	46%
O-XYLENE	434000	440	nc	4.2 J	2.4	-43%	0.19 U	0.19 U	0%	2.9	9	210%
TOTAL XYLENES	434000	440	nc	23.2 J	11.8	-49%	0.84 J	1.3	55%	15.9	28	76%

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USEPA = United States Environmental Protection Agency
TOTAL XYELENES values are calculated.

ca = screening value based on 1x 10^{-5} carcinogenic risk
nc = screening value based on noncarcinogenic hazard index = 1
A = American Council of Governmental Industrial Hygienists Theshold Limit Value
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OSHA PEL = Occupational Safety and Health Administration Pemissible Exposure Limit
Industrial Air Screening Levels from USEPA Regional Screening Levels for Chemical Chemical Contaminants mat Superfund Sites Nov-2012
Avg - Average

TABLE 2
FEBRUARY 2013 AND MARCH 2013 INDOOR AIR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	OSHA PEL (µg/m3)	Industrial Air Screening Level (µg/m3)	KEY	IA-116-A-14A 27-Mar-13 116-A	IAQ-118-A-14 5-Feb-13 118-A	IA-118-A-14A 28-Mar-13 118-A	% change	IAQ-138-A-14 5-Feb-13 138-A	IA-138-A-14A 27-Mar-13 138-A	% change
Volatile Organic Compounds (µg/m^3)										
BENZENE	319	16	ca	0.49	0.88 J	0.65	-26%	0.81	1.2	48%
CARBON TETRACHLORIDE	62,900	20	ca	0.36 U	0.36 U	0.36 U	0%	0.36 U	0.36 U	0%
CHLORODIFLUOROMETHANE	3,590,000	220,000	nc	0.97	0.18 U	7.2	N/A	0.18 U	0.93	N/A
CHLOROFORM	240,000	5.3	ca	0.2 U	0.5 J	0.2 U	N/A	0.2 U	0.2 U	0%
DICHLORODIFLUOROMETHANE	4,950,000	440	nc	2.7	2.8	2.4	-14%	2.9	2.5	-14%
1,1-DICHLOROETHANE	400,000	77	ca	0.22 U	0.22 U	2.8	N/A	0.22 U	0.22 U	0%
1,2-DICHLOROETHANE	400,000	4.7	ca	0.2 U	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
1,1-DICHLOROETHENE	NA	880	nc	0.22 U	0.22 U	4.2	N/A	0.93	0.22 U	N/A
CIS-1,2-DICHLOROETHENE	790,000	---	----	0.19 U	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%
TRANS-1,2-DICHLOROETHENE	790,000	260	nc	0.19 U	0.19 U	0.19 U	0%	0.19 U	0.19 U	0%
ETHYLBENZENE	435,000	49	ca	0.19 U	2.2 J	1.5	-32%	0.19 U	0.19 U	0%
METHYL TERT-BUTYL ETHER	180,000 [A]	470	ca	0.24 U	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%
METHYLENE CHLORIDE	87,000	2,600	ca	0.85	0.74	1.4	89%	0.14 U	1.1	N/A
NAPHTHALENE	50,000	3.6	ca	0.25 U	0.85 J	0.25 U	N/A	0.85	0.25 U	N/A
TETRACHLOROETHENE	678,000	180	nc	0.39 U	0.39 U	0.39 U	0%	0.39 U	0.39 U	0%
TOLUENE	754,000	22,000	nc	50	60	40	-33%	2.7	50	1752%
1,2,4-TRICHLOROBENZENE	40,000 [N]	8.8	nc	0.45 U	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%
1,1,1-TRICHLOROETHANE	1,900,000	22,000	nc	0.27 U	0.67 J	1	49%	0.27 U	0.27 U	0%
1,1,2-TRICHLOROETHANE	45,000	0.88	nc	0.2 U	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
TRICHLOROETHENE	537,000	8.8	nc	0.71 J	2.8 J	2.9	4%	4.5	2.7	-40%
1,2,3-TRIMETHYLBENZENE	123,000	22	nc	0.18 U	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%
1,2,4-TRIMETHYLBENZENE	123,000	31	nc	0.8	0.95 J	0.6 J	-37%	0.23 U	0.23 U	0%
1,3,5-TRIMETHYLBENZENE	123,000	---	---	0.18 U	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%
VINYL CHLORIDE	21,560	28	ca	0.21 U	0.21 U	0.21 U	0%	0.21 U	0.21 U	0%
M+P-XYLENES	434000	440	nc	1.1 J	14 J	8.7	-38%	0.84 J	1 J	19%
O-XYLENE	434000	440	nc	0.19 U	2.9 J	2.1	-28%	0.19 U	0.19 U	0%
TOTAL XYLENES	434000	440	nc	1.1 J	16.9 J	10.8	-36%	0.84 J	1 J	19%

-14 = sample collected during Round 14 (February 2013)
-14A = sample collected during sub-slab depressurization system shutdown (March 2013)
Shaded cells indicate a concentration greater than the risk -based screening level
-- = not available
J = estimated value
U = not detected
USEPA = United States Environmental Protection Agency
TOTAL XYELENES values are calculated.

ca = screening value based on 1x 10^{-5} carcinogenic risk
nc = screening value based on noncarcinogenic hazard index = 1
A = American Council of Governmental Industrial Hygienists Theshold Limit Value
N = National Institute for Occupational Safety and Health Recommended Exposure Limit
OSHA PEL = Occupational Safety and Health Administration Pemissible Exposure Limit
Industrial Air Screening Levels from USEPA Regional Screening Levels for Chemical Contaminants contaminats at Superfiund Sites Nov-212
Avg - Average

TABLE 3
MARCH 2013 SUB-SLAB VAPOR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	Target Shallow Soil Gas Concentration (µg/m3)	KEY	SV-015-A-14A 27-Mar-13 015-A	SV-018-A-14A 27-Mar-13 018-A	SV-018-A-14A-D 27-Mar-13 018-A Dup	SV-108-A-14A 27-Mar-13 108-A	SV-118-A-14A 27-Mar-13 118-A
Volatile Organic Compounds (µg/m^3)							
BENZENE	533	ca	0.32 J	5.2 J	10 J	2	5.5
CARBON TETRACHLORIDE	667	ca	0.36 U	1.7	2.7	0.36 U	0.7 J
CHLORODIFLUOROMETHANE	7,333,333	nc	0.93	0.18 U	0.18 U	0.18 U	3.9
CHLOROFORM	177	ca	26	4.3 J	8.3 J	8.3	280
DICHLORODIFLUOROMETHANE	14,667	nc	2.4	2	2.4	2.5	2.4
1,1-DICHLOROETHANE	2,567	ca	170	800 J	1400 J	8300	830
1,2-DICHLOROETHANE	157	ca	0.66	14 J	29 J	2.4	0.2 U
1,1-DICHLOROETHENE	29,333	nc	3100	37000 J	67000 J	9500	5200
CIS-1,2-DICHLOROETHENE	----	----	7000	4400	5200	780	1100
TRANS-1,2-DICHLOROETHENE	8,667	nc	160	26 J	56 J	11	59
ETHYLBENZENE	1,633	ca	4.5	0.19 U	0.79	0.66	34
METHYL TERT-BUTYL ETHER	15,667	ca	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
METHYLENE CHLORIDE	86,667	nc	0.14 U	0.14 U	0.14 U	0.14 U	31
NAPHTHALENE	120	ca	0.25 U	0.25 UJ	2.7 J	0.59 J	22
TETRACHLOROETHENE	6,000	nc	1.2	28 J	64 J	2.3	4.3
TOLUENE	733,333	nc	160	36 J	82 J	64	37
1,2,4-TRICHLOROBENZENE	293	nc	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U
1,1,1-TRICHLOROETHANE	733,333	nc	460	73 J	240 J	360	340
1,1,2-TRICHLOROETHANE	29	ca	0.2 U	2.1	3.2	0.2 U	0.2 U
TRICHLOROETHENE	293	nc	8800	52000 J	96000 J	1800	17000
1,2,3-TRIMETHYLBENZENE	733	nc	0.18 U	0.18 U	0.18 U	0.18 U	22
1,2,4-TRIMETHYLBENZENE	1,033	nc	1.3	0.23 U	0.85	0.65 J	54
1,3,5-TRIMETHYLBENZENE	----	---	0.75	0.18 U	0.18 U	0.18 U	38
VINYL CHLORIDE	933	ca	12	160 J	310 J	12	4.9
M+P-XYLENES	14,667	nc	23	1.9 J	3.2 J	3.5	280
O-XYLENE	14,667	nc	8.8	0.44 J	0.97	1.5	100
TOTAL XYLENES	14,667	nc	31.8	2.34 J	4.17	5	380

-14A = sample collected during sub-slab depressurization system shutdown (March 2013)
Shaded cells indicate a concentration greater than risk-based screening level
µg/m^3 = micrograms per cubic meter
-- = not available
J = estimated value
U = nondetect
SV = sub-slab vapor
ca = screening value based on carcinogenic effects
nc = screening value based on noncarcinogenic effects

(1) Screening values derived in accordance with Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (November 2002). Screening values are equal to United States Environmental Protection Agency (USEPA) Industrial Air Screening Values divided by an attenuation factor of 0.03, and correspond to a target cancer risk level of 1.0E-05.

TABLE 4
FEBRUARY 2013 AND MARCH 2013 SUB-SLAB VAPOR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	Target Shallow Soil Gas Concentration (µg/m3)[1]	KEY	SV-015-A-14 5-Feb-13	SV-015-A-14A 27-Mar-13	% change	SV-018-A-14 5-Feb-13	SV-018-A-14A-AVG 27-Mar-13	% change
			015-A	015-A		018-A	018-A Avg	
Volatile Organic Compounds (µg/m^3)								
BENZENE	533	ca	0.13 U	0.32 J	N/A	23	7.6	-67%
CARBON TETRACHLORIDE	667	ca	0.77 J	0.36 U	N/A	7	2.2	-69%
CHLORODIFLUOROMETHANE	7,333,333	nc	0.18 U	0.93	N/A	0.18 U	0.18 U	0%
CHLOROFORM	177	ca	6.8	26	282%	15	6.3	-58%
DICHLORODIFLUOROMETHANE	14,667	nc	2.7	2.4	-11%	2.8	2.2	-21%
1,1-DICHLOROETHANE	2,567	ca	13	170	1208%	410	1100	168%
1,2-DICHLOROETHANE	157	ca	0.2 U	0.66	N/A	44	21.5	-51%
1,1-DICHLOROETHENE	29,333	nc	490	3100	533%	54000	52000	-4%
CIS-1,2-DICHLOROETHENE	----	----	1300	7000	438%	3800	4800	26%
TRANS-1,2-DICHLOROETHENE	8,667	nc	23	160	596%	66	41	-38%
ETHYLBENZENE	1,633	ca	2.3 K	4.5	96%	0.19 U	0.4425	N/A
METHYL TERT-BUTYL ETHER	15,667	ca	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%
METHYLENE CHLORIDE	86,667	nc	0.74	0.14 U	N/A	0.14 U	0.14 U	0%
NAPHTHALENE	120	ca	0.8	0.25 U	N/A	0.25 U	1.4125	N/A
TETRACHLOROETHENE	6,000	nc	0.39 U	1.2	N/A	110	46	-58%
TOLUENE	733,333	nc	14	160	1043%	4.1	59	1339%
1,2,4-TRICHLOROBENZENE	293	nc	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%
1,1,1-TRICHLOROETHANE	733,333	nc	140	460	229%	270	156.5	-42%
1,1,2-TRICHLOROETHANE	29	ca	0.2 U	0.2 U	0%	6	2.65	-56%
TRICHLOROETHENE	293	nc	710	8800	1139%	95000	74000	-22%
1,2,3-TRIMETHYLBENZENE	733	nc	0.18 U	0.18 U	0%	0.18 U	0.18 U	0%
1,2,4-TRIMETHYLBENZENE	1,033	nc	0.85	1.3	53%	0.23 U	0.4825	N/A
1,3,5-TRIMETHYLBENZENE	----	---	0.18 U	0.75	N/A	0.18 U	0.18 U	0%
VINYL CHLORIDE	933	ca	1.4	12	757%	170	235	38%
M+P-XYLENES	14,667	nc	8.8 J	23	161%	0.62 J	2.55	311%
O-XYLENE	14,667	nc	8.5	8.8	4%	0.19 U	0.705	N/A
TOTAL XYLENES	14,667	nc	17.3 J	31.8	84%	0.62 J	3.255	425%

-14 =sample collected during Round 14 (February 2013)

-14A = sample collected during sub-slab depressurization system shutdown (March 2013)

Notes: All sample concentrations are in micrograms per cubic meter (µg/m3)

Shaded cells indicate a concentration greater than risk-based screening level

µg/m^3 = micrograms per cubic meter

-- = not available

U = nondetect

ca = screening value based on carcinogenic effects

nc = screening value based on noncarcinogenic effects

TOTAL XYELENES values are calculated.

Avg - Average

(1) Screening values derived in accordance with Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (November 2002). Screening values are equal to United States Environmental Protection Agency (USEPA) Industrial Air Screening Values divided by an attenuation factor of 0.03, and correspond to a target cancer risk level of 1.0E-05.

TABLE 4
FEBRUARY 2013 AND MARCH 2013 SUB-SLAB VAPOR RESULTS
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
MIDDLE RIVER, MARYLAND

SAMPLE ID SAMPLE DATE	Target Shallow Soil Gas Concentration (µg/m3)[1]	KEY	SV-108-A-14-AVG 5-Feb-13	SV-108-A-14A 27-Mar-13	% change	SV-118-A-14 5-Feb-13	SV-118-A-14A 27-Mar-13	% change
			108-A Avg	108-A		118-A	118-A	
Volatile Organic Compounds (µg/m^3)								
BENZENE	533	ca	1.5	2	33%	1.9 J	5.5	189%
CARBON TETRACHLORIDE	667	ca	0.41	0.36 U	N/A	0.83 J	0.7 J	-16%
CHLORODIFLUOROMETHANE	7,333,333	nc	0.18 U	0.18 U	0%	0.18 U	3.9	N/A
CHLOROFORM	177	ca	7.9	8.3	5%	55	280	409%
DICHLORODIFLUOROMETHANE	14,667	nc	2.7	2.5	-7%	3.2 J	2.4	-25%
1,1-DICHLOROETHANE	2,567	ca	3050	8300	172%	61	830	1261%
1,2-DICHLOROETHANE	157	ca	1.7	2.4	41%	0.2 U	0.2 U	0%
1,1-DICHLOROETHENE	29,333	nc	3850	9500	147%	1100	5200	373%
CIS-1,2-DICHLOROETHENE	----	----	330	780	136%	410 J	1100	168%
TRANS-1,2-DICHLOROETHENE	8,667	nc	6.1	11	80%	13	59	354%
ETHYLBENZENE	1,633	ca	1.12	0.66	-41%	75	34	-55%
METHYL TERT-BUTYL ETHER	15,667	ca	0.24 U	0.24 U	0%	0.24 U	0.24 U	0%
METHYLENE CHLORIDE	86,667	nc	0.985	0.14 U	N/A	12 J	31	158%
NAPHTHALENE	120	ca	36.95	0.59 J	-98%	35	22	-37%
TETRACHLOROETHENE	6,000	nc	2.45	2.3	-6%	1.9 J	4.3	126%
TOLUENE	733,333	nc	6.1	64	949%	8	37	363%
1,2,4-TRICHLOROBENZENE	293	nc	0.45 U	0.45 U	0%	0.45 U	0.45 U	0%
1,1,1-TRICHLOROETHANE	733,333	nc	175	360	106%	29	340	1072%
1,1,2-TRICHLOROETHANE	29	ca	0.2 U	0.2 U	0%	0.2 U	0.2 U	0%
TRICHLOROETHENE	293	nc	590	1800	205%	5100	17000	233%
1,2,3-TRIMETHYLBENZENE	733	nc	1.4	0.18 U	N/A	22	22	0%
1,2,4-TRIMETHYLBENZENE	1,033	nc	5.15	0.65 J	-87%	92	54	-41%
1,3,5-TRIMETHYLBENZENE	----	---	3.05	0.18 U	N/A	50	38	-24%
VINYL CHLORIDE	933	ca	12	12	0%	2.9 J	4.9	69%
M+P-XYLENES	14,667	nc	7.3	3.5	-52%	810	280	-65%
O-XYLENE	14,667	nc	2.85	1.5	-47%	200	100	-50%
TOTAL XYLENES	14,667	nc	10.15	5	-51%	1010	380	-62%

-14 =sample collected during Round 14 (February 2013)

-14A = sample collected during sub-slab depressurization system shutdown (March 2013)

Notes: All sample concentrations are in micrograms per cubic meter (µg/m3)

Shaded cells indicate a concentration greater than risk-based screening level

µg/m^3 = micrograms per cubic meter

-- = not available

U = nondetect

ca = screening value based on carcinogenic effects

nc = screening value based on noncarcinogenic effects

TOTAL XYELENES values are calculated.

Avg - Average

(1) Screening values derived in accordance with Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (November 2002). Screening values are equal to United States Environmental Protection Agency (USEPA) Industrial Air Screening Values divided by an attenuation factor of 0.03, and correspond to a target cancer risk level of 1.0E-05.

FIGURE 1

Figure 1

Indoor Air and Sub-Slab Vapor Results Greater Than Screening Levels Building A SSD System Shutdown Sampling March 2013

019-A
020-A
095-A
094-A
074-A
075-A
021-A
109-A
022-A
076-A
136-A
110-A
070-A
116-A
077-A
078-A
018-A-14A-SV
1,1-Dichloroethene 37000 J
Trichloroethene 52000 J
018-A-14A-D-SV
1,1-Dichloroethene 67000 J
Trichloroethene 96000 J
108-A-14A-SV
1,1-Dichloroethane 8300
Trichloroethene 1800
023-A
117-A
013-A
014-A
011-A
012-A
025-A
096-A
106-A
024-AX
024-A
071-A
118-A-14A-SV
Chloroform 280
Trichloroethene 17000
016-A
079-A
138-A
017-A
015-A-14A-SV
Trichloroethene 8800
119-A
107-A
139-A
072-A
097-A
046-A
046-AX
120-A
093-A
047-A
073-A
027-A
028-A
BND6
BND6
BND6
MAINTGAR
081-A
080-A

Legend

- IAQ, Basement
- IAQ, 1st Floor
- SV
- SSD Vapor Extraction Trench
- SSD Radius of Influence
- Buildings A, B, and C
- Building B and C Basement
- SSD Treatment Unit
- March 2013 SV and IAQ Sample Location
- March 2013 IAQ Sample Location
- March 2013 Exceedance

concentrations in ug/m^3

ug/m^3- micrograms per cubic meter
SSD- Sub-Slab Vapor Depression System
IAQ- Indoor Air Quality
SV - Sub-Slab Vapor

N

0 20 40 60 80 Feet

Lockheed Martin Middle River Complex
Middle River, Maryland

DATE MODIFIED: 5/20/13
CREATED BY: MP

Tetra Tech, Inc.

Map Document: (K:\GProject\middle_river\Maps\Block I bldg A_March 2013 SSD System Shutdown exceedances.mxd)
5/20/2013 -- 11:56:41 AM

APPENDIX A
FIELD DOCUMENTATION AND DATA VALIDATION REPORTS

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRC SV + IAQ
Date: 3/27/13, 3/28/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE 3/27		INDOOR AIR QUALITY SAMPLE 3/28	
SV Sample ID:	SV-015-A-14A	IAQ Sample ID:	IA-015-A-14A
SV Canister #:	357	IAQ Canister #:	556
SV Regulator #:	111	IAQ Regulator #:	299
SV Start Time:	1048	IAQ Start Time:	0924
SV Start Pressure:	-30	IAQ Start Pressure:	-18.5
SV Stop Time:	1158	IAQ Stop Time:	1739
SV Stop Pressure:	-2	IAQ Stop Pressure:	-1

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

BUILDING A PLATING SHOP

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRC SV+IAQ
Date: 3/27/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:	SV-018-A-14A	IAQ Sample ID:	IA-018-A-14A
SV Canister #:	98	IAQ Canister #:	1183
SV Regulator #:	59	IAQ Regulator #:	271
SV Start Time:	1036	IAQ Start Time:	0957
SV Start Pressure:	1215	IAQ Start Pressure:	-30
SV Stop Time:	-29	IAQ Stop Time:	1802
SV Stop Pressure:	-4	IAQ Stop Pressure:	-11

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

BUILDING A BASEMENT IN PUMP ROOM

OBSERVATIONS / NOTES:

DUPLICATES	CAN	REG	VACUUM
SV-DUP1-A-14A	554	—	-29/-3
IA-DUP1-A-14A	1174	177	-30/-1

Circle if Applicable:

MS/MSD

Duplicate ID No.: SV-DUP1-A-14A
IA-DUP1-A-14A

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRCSV+IAQ
Date: 3/27/13, 3/28/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE 3/27		INDOOR AIR QUALITY SAMPLE 3/28	
SV Sample ID:	SV-108-A-14A	IAQ Sample ID:	IA-108-A-14A
SV Canister #:	133	IAQ Canister #:	360
SV Regulator #:	1167	IAQ Regulator #:	187
SV Start Time:	1053	IAQ Start Time:	0926
SV Start Pressure:	-28	IAQ Start Pressure:	-30
SV Stop Time:	1201	IAQ Stop Time:	1743
SV Stop Pressure:	0	IAQ Stop Pressure:	-10

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

SMALL ROOM EAST OF PLATING SHOP

OBSERVATIONS / NOTES:

GREASE FROM NEARBY MACHINERY ON FLOOR

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRCSV+IAQ
Date: 3/27/13, 3/28/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE 3/27		INDOOR AIR QUALITY SAMPLE 3/28	
SV Sample ID:	SV-118-A-14A	IAQ Sample ID:	IA-118-A-14A
SV Canister #:	429	IAQ Canister #:	544
SV Regulator #:	176	IAQ Regulator #:	295
SV Start Time:	1102	IAQ Start Time:	0935
SV Start Pressure:	-30	IAQ Start Pressure:	-30
SV Stop Time:	1207	IAQ Stop Time:	1748
SV Stop Pressure:	0	IAQ Stop Pressure:	-4

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

IN CONTROLLED ENVIRONMENT ROOM EAST OF BUILDING A PLATING SHOP

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRC SV + IAQ
Date: 3/28/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:		IAQ Sample ID:	IA-076-A-14A
SV Canister #:		IAQ Canister #:	138
SV Regulator #:		IAQ Regulator #:	1157
SV Start Time:		IAQ Start Time:	0938
SV Start Pressure:		IAQ Start Pressure:	-30
SV Stop Time:		IAQ Stop Time:	1758
SV Stop Pressure:		IAQ Stop Pressure:	0

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

NORTH CENTRAL PORTION OF BUILDING A IN MIDDLE OF CONNECTING ACCESS WALKWAY

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MEC SV + IAQ
Date: 3/28/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:		IAQ Sample ID:	IA-079-A-14A
SV Canister #:		IAQ Canister #:	558
SV Regulator #:		IAQ Regulator #:	172
SV Start Time:		IAQ Start Time:	0930
SV Start Pressure:		IAQ Start Pressure:	-30
SV Stop Time:		IAQ Stop Time:	1750
SV Stop Pressure:		IAQ Stop Pressure:	0

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

BUILDING A NEAR AUTOCLAVES

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MEC SV + IAQ
Date: 3/27/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:		IAQ Sample ID:	IA-093-A-14A
SV Canister #:		IAQ Canister #:	542
SV Regulator #:		IAQ Regulator #:	180
SV Start Time:		IAQ Start Time:	1020
SV Start Pressure:		IAQ Start Pressure:	-28
SV Stop Time:		IAQ Stop Time:	1816
SV Stop Pressure:		IAQ Stop Pressure:	-1

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1 L SUMMA	✓

LOCATION:

SOUTHERN END OF BUILDING A BASEMENT

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MEC SV + IAQ
Date: 3/27/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:		IAQ Sample ID:	IA-116-A-14A
SV Canister #:		IAQ Canister #:	571
SV Regulator #:		IAQ Regulator #:	262
SV Start Time:		IAQ Start Time:	1013
SV Start Pressure:		IAQ Start Pressure:	-28
SV Stop Time:		IAQ Stop Time:	1808
SV Stop Pressure:		IAQ Stop Pressure:	0

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1 L SUMMA	✓

LOCATION:

BUILDING A BASEMENT

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TETRA TECH

SOIL VAPOR AND INDOOR AIR QUALITY SAMPLE LOG SHEET

Project Site Name: MRC SV+IAQ
Date: 3/27/13
Project Number - Task: 112IC04792
Sampled By: TA

SAMPLING DATA:

SOIL VAPOR SAMPLE		INDOOR AIR QUALITY SAMPLE	
SV Sample ID:		IAQ Sample ID:	IA-138-A-14A
SV Canister #:		IAQ Canister #:	367
SV Regulator #:		IAQ Regulator #:	296
SV Start Time:		IAQ Start Time:	1023
SV Start Pressure:		IAQ Start Pressure:	-30
SV Stop Time:		IAQ Stop Time:	1818
SV Stop Pressure:		IAQ Stop Pressure:	-7

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected
TO15	1L SUMMA	✓

LOCATION:

BUILDING A BASEMENT

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Centek Chain of Custody

Centek Laboratories

143 Midler Park Drive
Syracuse, NY 13206
315-431-9730
www.CentekLabs.com

Vapor Intrusion & IAQ

Site Name: Middle River
Project: SV AND IAQ
PO#: 112IC04792-03
Quote # Q-1653
Other: BO3569

Detection Limit		Report Level	
☐	5ppbv	☐	Level I
x	1ug/M3	☐	Level II
☐	1ug/M3 +TCE .25	x	Cat "B" Like

Turnaround Time:	Check One	Rush TAT Surcharge %	Due Date:
5 Business Days	x	0%	
4 Business Days	☐	25%	
3 Business Days	☐	50%	
2 Business Days	☐	75%	
Next Day by 5pm	☐	100%	
Next Day by Noon	☐	150%	
Same Day	☐	200%	

Company: Tetra Tech, Inc.

Report to:
Address: 2171 W. Park Court, Suite E
City, State, Zip: Stone Mountain, GA 30087
Email: Eric.Samuels@tetratech.com; Joseph.Samchuck@tetratech.com
Phone: (770) 413-0965

Company:
Check Here If Same: x

Invoice to:
Address:
City, State, Zip
Email:
Phone:

Sample ID	Date Sampled	Canister Number	Regulator Number	Analysis Request	Comments TIMES	Vacuum Start/Stop
SV-018-A-14A	3/27/13	98	59	TO15	1036 / 1215	-29 / -4
SV-015-A-14A	3/27/13	357	111	TO15	1048 / 1158	-30 / -2
SV-108-A-14A	3/27/13	133	1167	TO15	1053 / 1201	-28 / 0
SV-118-A-14A	3/27/13	429	176	TO15	1102 / 1207	-30 / 0
SV-DUP1-A-14A	3/27/13	554	—	TO15	— / —	-29 / -3
IA-018-A-14A	3/27/13	1183	271	TO15	0957 / 1802	-30 / -11
IA-116-A-14A	3/27/13	571	262	TO15	1013 / 1808	-28 / 0
IA-138-A-14A	3/27/13	367	296	TO15	1023 / 1818	-30 / -7
IA-093-A-14A	3/27/13	542	180	TO15	1020 / 1816	-28 / -1
IA-DUP1-A-14A	3/27/13	1174	177	TO15	— / —	-30 / -1

Chain of Custody	Print Name	Signature	Date/Time	Courier: CIRCLE ONE
Sampled by:	TONY APANAVAGE		3/27/13	FedEx UPS Pickup/Dropoff
Relinquished by:			1845	For LAB USE ONLY
Received at Lab by:	Jan Scala		3/28/13	Work Order # C1303079

*** By signing Centek Labs Chain of Custody, you are accepting Centek Labs Terms and Conditions listed on the reverse side.

Centek Chain of Custody

Centek Laboratories
143 Midler Park Drive
Syracuse, NY 13206
315-431-9730
www.CentekLabs.com

Vapor Intrusion & IAQ

Site Name: Middle River
Project: SVAND IAQ
PO#: 112IC04792-03
Quote # Q-1653
Other: BO3569

Detection Limit	Report Level
☐ 5ppbv	☐ Level I
☒ 1ug/M3	☐ Level II
☐ 1ug/M3 +TCE .25	☒ Cat "B" Like

Turnaround Time:	Check One	Rush TAT Surcharge %	Due Date:
5 Business Days	☒	0%	
4 Business Days	☐	25%	
3 Business Days	☐	50%	
2 Business Days	☐	75%	
Next Day by 5pm	☐	100%	
Next Day by Noon	☐	150%	
Same Day	☐	200%	

Company: Tetra Tech, Inc.
Report to:
Address: 2171 W. Park Court, Suite E
City, State, Zip: Stone Mountain, GA 30087
Email: Eric.Samuels@tetratech.com; Joseph.Samchuck@tetratech.com
Phone: (770) 413-0965

Company:
Check Here If Same: ☒
Invoice to:
Address:
City, State, Zip
Email:
Phone:

Sample ID	Date Sampled	Canister Number	Regulator Number	Analysis Request	Comments TIMES	Vacuum Start/Stop
IA-015-A-14A	3/28/13	556	299	TO15	0924/1739	-185/-1
IA-118-A-14A	3/28/13	544	295	TO15	0935/1748	-30/-4
IA-079-A-14A	3/28/13	558	172	TO15	0930/1750	-30/0
IA-076-A-14A	3/28/13	138	1157	TO15	0938/1758	-30/0
IA-108-A-14A	3/28/13	360	187	TO15	0926/1743	-30/-10

Chain of Custody	Print Name	Signature	Date/Time
Sampled by:	TONY APANNAGE		3/29/13 1100
Relinquished by:			
Received at Lab by:	Jan Scala		4/1/13

Courier: CIRCLE ONE
FedEx UPS Pickup/Dropoff

For LAB USE ONLY
Work Order # A1304005

*** By signing Centek Labs Chain of Custody, you are accepting Centek Labs Terms and Conditions listed on the reverse side.

Tetra Tech, INC INTERNAL CORRESPONDENCE

TO: **E. SAMUELS** **DATE:** **MAY 8, 2013**

FROM: **A. COGNETTI** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
LOCKHEED MIDDLE RIVER
SAMPLE DELIVERY GROUP (SDG) - C1303079

SAMPLES: 10/Air/VOC

IA-018-A-14A	IA-093-A-14A	IA-116-A-14A	IA-138-A-14A
IA-DUP1-A-14A	SV-015-A-14A	SV-018-A-14A	SV-108-A-14A
SV-118-A-14A	SV-DUP1-A-14A		

Overview

The sample set for Lockheed Middle River SDG C1303079 consisted of five (5) indoor air samples and five (5) soil vapor air samples. The air samples were analyzed for a select list of volatile organic compounds (VOC). Two (2) field duplicate pairs were associated with this sample delivery group (SDG): IA-DUP1-A-14A/IA-018-A-14A and SV-DUP1-A-14A/SV-018-A-14A.

The samples were collected by Tetra Tech on March 27, 2013 and sent to Centek Laboratories, LLC. The laboratory analyzed the samples in accordance with EPA Method TO-15 analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters: data completeness, holding times, GC/MS tuning, initial/continuing calibrations, laboratory method blank/canister blank results, blank spike/blank spike duplicate results, surrogate spike recoveries, internal standard recoveries, chromatographic resolution, compound identification, compound quantitation, field duplicate precision and detection limits. Areas of concern are listed below.

Major Issues

No major issues were identified.

Minor Issues

- Field duplicate imprecision was noted in the field duplicate pair IA-DUP1-A-14A and IA-018-A-14A. The relative percent differences (RPDs) were greater than the 50% quality control limit for cis-1,2-dichloroethene, m&p xylenes and toluene. The positive toluene results were qualified as estimated (J) in the field duplicate pair IA-DUP1-A-14A and IA-018-A-14A. No action was taken on the positive and nondetected cis-1,2-dichloroethene and m&p xylenes results. The variances for these analytes were less than 2X the reporting limit.

- Field duplicate imprecision was noted in the field duplicate pair SV-DUP1-A-14A and SV-018-A-14A. The RPDs were greater than the 50% quality control limit for several analytes. As noted on the field duplicate precision table included in Appendix C, several analytes were diluted in the samples at different dilutions. The analytes were 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, benzene and trichloroethene. The positive 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, benzene and trichloroethene results were qualified as estimated (J). The RPDs for 1,2-dichloroethane, chloroform, m&p xylenes, tetrachloroethene, toluene, trans-1,2-dichloroethene and vinyl chloride were greater than the 50% quality control limit.

The positive results in the field duplicate samples were greater than the reporting limit. The positive 1,2-dichloroethane, chloroform, m&p xylenes, tetrachloroethene, toluene, trans-1,2-dichloroethene and vinyl chloride results were qualified as estimated (J). In addition, the variance for naphthalene was greater than 2X the reporting limit. The positive and nondetected naphthalene results were qualified as estimated (J) and (UJ), respectively.

- Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

Additional Comments

Samples were analyzed at the following dilutions:

Sample	Dilution
IA-018-A-14A	10X (toluene)
IA-093-A-14A	10X (toluene)
IA-116-A-14A	10X (toluene)
IA-138-A-14A	10X (toluene)
IA-DUP1-A-14A	10X (toluene)
SV-015-A-14A	10X (chloroform, m&p xylenes, o-xylene, vinyl chloride), 40X (1,1,1-trichloroethane, 1,1-dichloroethane, toluene, trans-1,2-dichloroethene), 810X (1,1-dichloroethene, cis-1,2-dichloroethene, trichloroethene)
SV-018-A-14A	10X (1,1,1-trichloroethane, 1,2-dichloroethane, tetrachloroethene, toluene, trans-1,2-dichloroethene, 40X (vinyl chloride), 810X (1,1-dichloroethane, cis-1,2-dichloroethene), 7290X (1,1-dichloroethene, trichloroethene)
SV-108-A-14A	10X (toluene, trans-1,2-dichloroethene, vinyl chloride), 40X (1,1,1-trichloroethane), 810X (cis-1,2-dichloroethene, trichloroethene), 1620X (1,1-dichloroethane, 1,1-dichloroethene)
SV-118-A-14A	10X (1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, methylene chloride, naphthalene, o-xylene, toluene, trans-1,2-dichloroethene), 40X (1,1,1-trichloroethane, chloroform, m&p xylenes), 810X (1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene), 1620X (trichloroethene)
SV-DUP1-A-14A	10X (1,2-dichloroethane, benzene, tetrachloroethene, toluene, trans-1,2-dichloroethene), 40X (1,1,1-trichloroethane, vinyl chloride), 2430X (1,1-dichloroethene, cis-1,2-dichloroethene), 9720X (1,1-dichloroethene, trichloroethene)

The laboratory reported the VOC air result concentrations in units of µg/m3 and also ppbv on the sample forms. The results in the database and the qualified analytical result concentrations are reported as µg/m3 only.

Non-detected sample analytes results were reported to the method detection limit (MDL).

The data package initially reported the sample non-detected analytes only to the Reporting Limit (RL). The laboratory was contacted and reported the non-detected sample analytes to the MDL.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: Field duplicate imprecision was noted in both field duplicate pairs.

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the USEPA Method TO-15 and the Region III Modifications to the National Functional Guidelines for Organic Data Review (September 1994).

Ann Cognetti
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A - Qualified Analytical Results
Appendix B - Results as Reported by the Laboratory
Appendix C - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate

PROJ_NO: 04792	NSAMPLE	IA-018-A-14A			IA-093-A-14A			IA-116-A-14A			IA-138-A-14A		
SDG: C1303079	LAB_ID	C1303079-006A			C1303079-009A			C1303079-007A			C1303079-008A		
FRACTION: OV-M3	SAMP_DATE	3/27/2013			3/27/2013			3/27/2013			3/27/2013		
MEDIA: AIR	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/M3			UG/M3			UG/M3			UG/M3		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.27	U		0.27	U		0.27	U		0.27	U	
1,1,2-TRICHLOROETHANE		0.2	U		0.2	U		0.2	U		0.2	U	
1,1-DICHLOROETHANE		0.22	U		0.22	U		0.22	U		0.22	U	
1,1-DICHLOROETHENE		1.5			0.22	U		0.22	U		0.22	U	
1,2,3-TRIMETHYLBENZENE		0.18	U		0.18	U		0.18	U		0.18	U	
1,2,4-TRICHLOROBENZENE		0.45	U		0.45	U		0.45	U		0.45	U	
1,2,4-TRIMETHYLBENZENE		0.23	U		0.8			0.8			0.23	U	
1,2-DICHLOROETHANE		0.2	U		0.2	U		0.2	U		0.2	U	
1,3,5-TRIMETHYLBENZENE		0.18	U		0.18	U		0.18	U		0.18	U	
BENZENE		0.58			0.62			0.49			1.2		
CARBON TETRACHLORIDE		0.36	U		0.36	U		0.36	U		0.36	U	
CHLORODIFLUOROMETHANE		0.97			2.5			0.97			0.93		
CHLOROFORM		0.2	U		0.2	U		0.2	U		0.2	U	
CIS-1,2-DICHLOROETHENE		0.48	J	P	0.19	U		0.19	U		0.19	U	
DICHLORODIFLUOROMETHANE		2.7			2.9			2.7			2.5		
ETHYLBENZENE		0.19	U		0.19	U		0.19	U		0.19	U	
M+P-XYLENES		1.5			1.3			1.1	J	P	1	J	P
METHYL TERT-BUTYL ETHER		0.24	U		0.24	U		0.24	U		0.24	U	
METHYLENE CHLORIDE		0.99			3.1			0.85			1.1		
NAPHTHALENE		1			0.69	J	P	0.25	U		0.25	U	
O-XYLENE		0.19	U		0.19	U		0.19	U		0.19	U	
TETRACHLOROETHENE		0.39	U		0.39	U		0.39	U		0.39	U	
TOLUENE		57	J	G	41			50			50		
TRANS-1,2-DICHLOROETHENE		0.19	U		0.19	U		0.19	U		0.19	U	
TRICHLOROETHENE		3.3			1.2			0.71	J	P	2.7		
VINYL CHLORIDE		0.21	U		0.21	U		0.21	U		0.21	U	

PROJ_NO: 04792	NSAMPLE	IA-DUP1-A-14A			SV-015-A-14A			SV-018-A-14A			SV-108-A-14A		
SDG: C1303079	LAB_ID	C1303079-010A			C1303079-002A			C1303079-001A			C1303079-003A		
FRACTION: OV-M3	SAMP_DATE	3/27/2013			3/27/2013			3/27/2013			3/27/2013		
MEDIA: AIR	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/M3			UG/M3			UG/M3			UG/M3		
	PCT_SOLIDS												
	DUP_OF	IA-018-A-14A											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.27	U		460			73	J	G	360		
1,1,2-TRICHLOROETHANE		0.2	U		0.2	U		2.1			0.2	U	
1,1-DICHLOROETHANE		0.22	U		170			800	J	G	8300		
1,1-DICHLOROETHENE		1.3			3100			37000	J	G	9500		
1,2,3-TRIMETHYLBENZENE		0.18	U		0.18	U		0.18	U		0.18	U	
1,2,4-TRICHLOROBENZENE		0.45	U		0.45	U		0.45	U		0.45	U	
1,2,4-TRIMETHYLBENZENE		0.23	U		1.3			0.23	U		0.65	J	P
1,2-DICHLOROETHANE		0.2	U		0.66			14	J	G	2.4		
1,3,5-TRIMETHYLBENZENE		0.18	U		0.75			0.18	U		0.18	U	
BENZENE		0.55			0.32	J	P	5.2	J	G	2		
CARBON TETRACHLORIDE		0.36	U		0.36	U		1.7			0.36	U	
CHLORODIFLUOROMETHANE		1			0.93			0.18	U		0.18	U	
CHLOROFORM		0.2	U		26			4.3	J	G	8.3		
CIS-1,2-DICHLOROETHENE		0.19	U		7000			4400			780		
DICHLORODIFLUOROMETHANE		2.8			2.4			2			2.5		
ETHYLBENZENE		0.19	U		4.5			0.19	U		0.66		
M+P-XYLENES		0.66	J	P	23			1.9	J	G	3.5		
METHYL TERT-BUTYL ETHER		0.24	U		0.24	U		0.24	U		0.24	U	
METHYLENE CHLORIDE		0.74			0.14	U		0.14	U		0.14	U	
NAPHTHALENE		1.3			0.25	U		0.25	UJ	G	0.59	J	P
O-XYLENE		0.19	U		8.8			0.44	J	P	1.5		
TETRACHLOROETHENE		0.39	U		1.2			28	J	G	2.3		
TOLUENE		22	J	G	160			36	J	G	64		
TRANS-1,2-DICHLOROETHENE		0.19	U		160			26	J	G	11		
TRICHLOROETHENE		2.7			8800			52000	J	G	1800		
VINYL CHLORIDE		0.21	U		12			160	J	G	12		

PROJ_NO: 04792	NSAMPLE	SV-118-A-14A			SV-DUP1-A-14A		
SDG: C1303079	LAB_ID	C1303079-004A			C1303079-005A		
FRACTION: OV-M3	SAMP_DATE	3/27/2013			3/27/2013		
MEDIA: AIR	QC_TYPE	NM			NM		
	UNITS	UG/M3			UG/M3		
	PCT_SOLIDS						
	DUP_OF				SV-018-A-14A		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		340			240	J	G
1,1,2-TRICHLOROETHANE		0.2	U		3.2		
1,1-DICHLOROETHANE		830			1400	J	GP
1,1-DICHLOROETHENE		5200			67000	J	G
1,2,3-TRIMETHYLBENZENE		22			0.18	U	
1,2,4-TRICHLOROBENZENE		0.45	U		0.45	U	
1,2,4-TRIMETHYLBENZENE		54			0.85		
1,2-DICHLOROETHANE		0.2	U		29	J	G
1,3,5-TRIMETHYLBENZENE		38			0.18	U	
BENZENE		5.5			10	J	G
CARBON TETRACHLORIDE		0.7	J	P	2.7		
CHLORODIFLUOROMETHANE		3.9			0.18	U	
CHLOROFORM		280			8.3	J	G
CIS-1,2-DICHLOROETHENE		1100			5200		
DICHLORODIFLUOROMETHANE		2.4			2.4		
ETHYLBENZENE		34			0.79		
M+P-XYLENES		280			3.2	J	G
METHYL TERT-BUTYL ETHER		0.24	U		0.24	U	
METHYLENE CHLORIDE		31			0.14	U	
NAPHTHALENE		22			2.7	J	G
O-XYLENE		100			0.97		
TETRACHLOROETHENE		4.3			64	J	G
TOLUENE		37			82	J	G
TRANS-1,2-DICHLOROETHENE		59			56	J	G
TRICHLOROETHENE		17000			96000	J	G
VINYL CHLORIDE		4.9			310	J	G

Appendix B

Results as Reported by the Laboratory

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	IA-018-A-14A
Lab Order:	C1303079	**Tag Number:**	1183,271
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-006A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 8:37:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 8:37:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 8:37:00 PM
1,1-Dichloroethene	1.5		0.22	0.60	ug/m3	1	4/1/2013 8:37:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 8:37:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 8:37:00 PM
1,2,4-Trimethylbenzene	< 0.75		0.23	0.75	ug/m3	1	4/1/2013 8:37:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 8:37:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 8:37:00 PM
Benzene	0.58		0.13	0.49	ug/m3	1	4/1/2013 8:37:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 8:37:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 8:37:00 PM
cis-1,2-Dichloroethene	0.48	J	0.19	0.60	ug/m3	1	4/1/2013 8:37:00 PM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 8:37:00 PM
Freon 12	2.7		0.20	0.75	ug/m3	1	4/1/2013 8:37:00 PM
Freon 22	0.97		0.18	0.54	ug/m3	1	4/1/2013 8:37:00 PM
m&p-Xylene	1.5		0.44	1.3	ug/m3	1	4/1/2013 8:37:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 8:37:00 PM
Methylene chloride	0.99		0.14	0.53	ug/m3	1	4/1/2013 8:37:00 PM
Naphthalene	1.0		0.25	0.80	ug/m3	1	4/1/2013 8:37:00 PM
o-Xylene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 8:37:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 8:37:00 PM
Toluene	57		1.5	5.7	ug/m3	10	4/2/2013 5:24:00 AM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 8:37:00 PM
Trichloroethene	3.3		0.36	0.82	ug/m3	1	4/1/2013 8:37:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 8:37:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	IA-093-A-14A
Lab Order:	C1303079	**Tag Number:**	542,180
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-009A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 10:21:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 10:21:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 10:21:00 PM
1,1-Dichloroethene	< 0.60		0.22	0.60	ug/m3	1	4/1/2013 10:21:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 10:21:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 10:21:00 PM
1,2,4-Trimethylbenzene	0.80		0.23	0.75	ug/m3	1	4/1/2013 10:21:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 10:21:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 10:21:00 PM
Benzene	0.62		0.13	0.49	ug/m3	1	4/1/2013 10:21:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 10:21:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 10:21:00 PM
cis-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 10:21:00 PM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 10:21:00 PM
Freon 12	2.9		0.20	0.75	ug/m3	1	4/1/2013 10:21:00 PM
Freon 22	2.5		0.18	0.54	ug/m3	1	4/1/2013 10:21:00 PM
m&p-Xylene	1.3		0.44	1.3	ug/m3	1	4/1/2013 10:21:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 10:21:00 PM
Methylene chloride	3.1		0.14	0.53	ug/m3	1	4/1/2013 10:21:00 PM
Naphthalene	0.69	J	0.25	0.80	ug/m3	1	4/1/2013 10:21:00 PM
o-Xylene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 10:21:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 10:21:00 PM
Toluene	41		1.5	5.7	ug/m3	10	4/2/2013 7:07:00 AM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 10:21:00 PM
Trichloroethene	1.2		0.36	0.82	ug/m3	1	4/1/2013 10:21:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 10:21:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	IA-116-A-14A
Lab Order:	C1303079	**Tag Number:**	571,262
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-007A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 9:12:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 9:12:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 9:12:00 PM
1,1-Dichloroethene	< 0.60		0.22	0.60	ug/m3	1	4/1/2013 9:12:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 9:12:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 9:12:00 PM
1,2,4-Trimethylbenzene	0.80		0.23	0.75	ug/m3	1	4/1/2013 9:12:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 9:12:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 9:12:00 PM
Benzene	0.49		0.13	0.49	ug/m3	1	4/1/2013 9:12:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 9:12:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 9:12:00 PM
cis-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 9:12:00 PM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 9:12:00 PM
Freon 12	2.7		0.20	0.75	ug/m3	1	4/1/2013 9:12:00 PM
Freon 22	0.97		0.18	0.54	ug/m3	1	4/1/2013 9:12:00 PM
m&p-Xylene	1.1	J	0.44	1.3	ug/m3	1	4/1/2013 9:12:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 9:12:00 PM
Methylene chloride	0.85		0.14	0.53	ug/m3	1	4/1/2013 9:12:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 9:12:00 PM
o-Xylene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 9:12:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 9:12:00 PM
Toluene	50		1.5	5.7	ug/m3	10	4/2/2013 5:59:00 AM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 9:12:00 PM
Trichloroethene	0.71	J	0.36	0.82	ug/m3	1	4/1/2013 9:12:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 9:12:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	IA-138-A-14A
Lab Order:	C1303079	**Tag Number:**	367,296
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-008A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 9:46:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 9:46:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 9:46:00 PM
1,1-Dichloroethene	< 0.60		0.22	0.60	ug/m3	1	4/1/2013 9:46:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 9:46:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 9:46:00 PM
1,2,4-Trimethylbenzene	< 0.75		0.23	0.75	ug/m3	1	4/1/2013 9:46:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 9:46:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 9:46:00 PM
Benzene	1.2		0.13	0.49	ug/m3	1	4/1/2013 9:46:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 9:46:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 9:46:00 PM
cis-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 9:46:00 PM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 9:46:00 PM
Freon 12	2.5		0.20	0.75	ug/m3	1	4/1/2013 9:46:00 PM
Freon 22	0.93		0.18	0.54	ug/m3	1	4/1/2013 9:46:00 PM
m&p-Xylene	1.0	J	0.44	1.3	ug/m3	1	4/1/2013 9:46:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 9:46:00 PM
Methylene chloride	1.1		0.14	0.53	ug/m3	1	4/1/2013 9:46:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 9:46:00 PM
o-Xylene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 9:46:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 9:46:00 PM
Toluene	50		1.5	5.7	ug/m3	10	4/2/2013 6:33:00 AM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 9:46:00 PM
Trichloroethene	2.7		0.36	0.82	ug/m3	1	4/1/2013 9:46:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 9:46:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	IA-DUP1-A-14A
Lab Order:	C1303079	**Tag Number:**	1174,177
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-010A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**				Analyst: **RJP**
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 10:56:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 10:56:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 10:56:00 PM
1,1-Dichloroethene	1.3		0.22	0.60	ug/m3	1	4/1/2013 10:56:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 10:56:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 10:56:00 PM
1,2,4-Trimethylbenzene	< 0.75		0.23	0.75	ug/m3	1	4/1/2013 10:56:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 10:56:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 10:56:00 PM
Benzene	0.55		0.13	0.49	ug/m3	1	4/1/2013 10:56:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 10:56:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 10:56:00 PM
cis-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 10:56:00 PM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 10:56:00 PM
Freon 12	2.8		0.20	0.75	ug/m3	1	4/1/2013 10:56:00 PM
Freon 22	1.0		0.18	0.54	ug/m3	1	4/1/2013 10:56:00 PM
m&p-Xylene	0.66	J	0.44	1.3	ug/m3	1	4/1/2013 10:56:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 10:56:00 PM
Methylene chloride	0.74		0.14	0.53	ug/m3	1	4/1/2013 10:56:00 PM
Naphthalene	1.3		0.25	0.80	ug/m3	1	4/1/2013 10:56:00 PM
o-Xylene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 10:56:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 10:56:00 PM
Toluene	22		1.5	5.7	ug/m3	10	4/2/2013 7:42:00 AM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 10:56:00 PM
Trichloroethene	2.7		0.36	0.82	ug/m3	1	4/1/2013 10:56:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 10:56:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-015-A-14A
Lab Order:	C1303079	**Tag Number:**	351,111
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-002A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	460		11	33	ug/m3	40	4/2/2013 7:21:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/2/2013 12:06:00 AM
1,1-Dichloroethane	170		9.1	25	ug/m3	40	4/2/2013 7:21:00 PM
1,1-Dichloroethene	3100		180	480	ug/m3	810	4/3/2013 12:45:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/2/2013 12:06:00 AM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/2/2013 12:06:00 AM
1,2,4-Trimethylbenzene	1.3		0.23	0.75	ug/m3	1	4/2/2013 12:06:00 AM
1,2-Dichloroethane	0.66		0.20	0.62	ug/m3	1	4/2/2013 12:06:00 AM
1,3,5-Trimethylbenzene	0.75		0.18	0.75	ug/m3	1	4/2/2013 12:06:00 AM
Benzene	0.32	J	0.13	0.49	ug/m3	1	4/2/2013 12:06:00 AM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/2/2013 12:06:00 AM
Chloroform	26		2.0	7.4	ug/m3	10	4/2/2013 8:51:00 AM
cis-1,2-Dichloroethene	7000		160	480	ug/m3	810	4/3/2013 12:45:00 PM
Ethylbenzene	4.5		0.19	0.66	ug/m3	1	4/2/2013 12:06:00 AM
Freon 12	2.4		0.20	0.75	ug/m3	1	4/2/2013 12:06:00 AM
Freon 22	0.93		0.18	0.54	ug/m3	1	4/2/2013 12:06:00 AM
m&p-Xylene	23		4.4	13	ug/m3	10	4/2/2013 8:51:00 AM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/2/2013 12:06:00 AM
Methylene chloride	< 0.53		0.14	0.53	ug/m3	1	4/2/2013 12:06:00 AM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/2/2013 12:06:00 AM
o-Xylene	8.8		1.9	6.6	ug/m3	10	4/2/2013 8:51:00 AM
Tetrachloroethylene	1.2		0.39	1.0	ug/m3	1	4/2/2013 12:06:00 AM
Toluene	160		6.1	23	ug/m3	40	4/2/2013 7:21:00 PM
trans-1,2-Dichloroethene	160		7.7	24	ug/m3	40	4/2/2013 7:21:00 PM
Trichloroethene	8800		290	660	ug/m3	810	4/3/2013 12:45:00 PM
Vinyl chloride	12		2.1	3.9	ug/m3	10	4/2/2013 8:51:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-018-A-14A
Lab Order:	C1303079	**Tag Number:**	98,59
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-001A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	73		2.7	8.3	ug/m3	10	4/2/2013 8:17:00 AM
1,1,2-Trichloroethane	2.1		0.20	0.83	ug/m3	1	4/1/2013 11:30:00 PM
1,1-Dichloroethane	800		180	490	ug/m3	810	4/3/2013 11:38:00 AM
1,1-Dichloroethene	37000		1600	4400	ug/m3	7290	4/3/2013 12:12:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 11:30:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 11:30:00 PM
1,2,4-Trimethylbenzene	< 0.75		0.23	0.75	ug/m3	1	4/1/2013 11:30:00 PM
1,2-Dichloroethane	14		2.0	6.2	ug/m3	10	4/2/2013 8:17:00 AM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 11:30:00 PM
Benzene	5.2		0.13	0.49	ug/m3	1	4/1/2013 11:30:00 PM
Carbon tetrachloride	1.7		0.36	0.96	ug/m3	1	4/1/2013 11:30:00 PM
Chloroform	4.3		0.20	0.74	ug/m3	1	4/1/2013 11:30:00 PM
cis-1,2-Dichloroethene	4400		160	480	ug/m3	810	4/3/2013 11:38:00 AM
Ethylbenzene	< 0.66		0.19	0.66	ug/m3	1	4/1/2013 11:30:00 PM
Freon 12	2.0		0.20	0.75	ug/m3	1	4/1/2013 11:30:00 PM
Freon 22	< 0.54		0.18	0.54	ug/m3	1	4/1/2013 11:30:00 PM
m&p-Xylene	1.9		0.44	1.3	ug/m3	1	4/1/2013 11:30:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 11:30:00 PM
Methylene chloride	< 0.53		0.14	0.53	ug/m3	1	4/1/2013 11:30:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 11:30:00 PM
o-Xylene	0.44	J	0.19	0.66	ug/m3	1	4/1/2013 11:30:00 PM
Tetrachloroethylene	28		3.9	10	ug/m3	10	4/2/2013 8:17:00 AM
Toluene	36		1.5	5.7	ug/m3	10	4/2/2013 8:17:00 AM
trans-1,2-Dichloroethene	26		1.9	6.0	ug/m3	10	4/2/2013 8:17:00 AM
Trichloroethene	52000		2600	6000	ug/m3	7290	4/3/2013 12:12:00 PM
Vinyl chloride	160		8.3	16	ug/m3	40	4/2/2013 6:48:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-108-A-14A
Lab Order:	C1303079	**Tag Number:**	133,1167
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-003A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	360		11	33	ug/m3	40	4/2/2013 7:55:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/2/2013 12:41:00 AM
1,1-Dichloroethane	8300		360	990	ug/m3	1620	4/3/2013 4:05:00 PM
1,1-Dichloroethene	9500		350	970	ug/m3	1620	4/3/2013 4:05:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/2/2013 12:41:00 AM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/2/2013 12:41:00 AM
1,2,4-Trimethylbenzene	0.65	J	0.23	0.75	ug/m3	1	4/2/2013 12:41:00 AM
1,2-Dichloroethane	2.4		0.20	0.62	ug/m3	1	4/2/2013 12:41:00 AM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/2/2013 12:41:00 AM
Benzene	2.0		0.13	0.49	ug/m3	1	4/2/2013 12:41:00 AM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/2/2013 12:41:00 AM
Chloroform	8.3		0.20	0.74	ug/m3	1	4/2/2013 12:41:00 AM
cis-1,2-Dichloroethene	780		160	480	ug/m3	810	4/3/2013 1:19:00 PM
Ethylbenzene	0.66		0.19	0.66	ug/m3	1	4/2/2013 12:41:00 AM
Freon 12	2.5		0.20	0.75	ug/m3	1	4/2/2013 12:41:00 AM
Freon 22	< 0.54		0.18	0.54	ug/m3	1	4/2/2013 12:41:00 AM
m&p-Xylene	3.5		0.44	1.3	ug/m3	1	4/2/2013 12:41:00 AM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/2/2013 12:41:00 AM
Methylene chloride	< 0.53		0.14	0.53	ug/m3	1	4/2/2013 12:41:00 AM
Naphthalene	0.59	J	0.25	0.80	ug/m3	1	4/2/2013 12:41:00 AM
o-Xylene	1.5		0.19	0.66	ug/m3	1	4/2/2013 12:41:00 AM
Tetrachloroethylene	2.3		0.39	1.0	ug/m3	1	4/2/2013 12:41:00 AM
Toluene	64		1.5	5.7	ug/m3	10	4/2/2013 9:24:00 AM
trans-1,2-Dichloroethene	11		1.9	6.0	ug/m3	10	4/2/2013 9:24:00 AM
Trichloroethene	1800		290	660	ug/m3	810	4/3/2013 1:19:00 PM
Vinyl chloride	12		2.1	3.9	ug/m3	10	4/2/2013 9:24:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-118-A-14A
Lab Order:	C1303079	**Tag Number:**	429,176
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-004A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	340		11	33	ug/m3	40	4/2/2013 9:03:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/2/2013 1:17:00 AM
1,1-Dichloroethane	830		180	490	ug/m3	810	4/3/2013 1:52:00 PM
1,1-Dichloroethene	5200		180	480	ug/m3	810	4/3/2013 1:52:00 PM
1,2,3-Trimethylbenzene	22		1.8	7.5	ug/m3	10	4/2/2013 8:29:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/2/2013 1:17:00 AM
1,2,4-Trimethylbenzene	54		2.3	7.5	ug/m3	10	4/2/2013 8:29:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/2/2013 1:17:00 AM
1,3,5-Trimethylbenzene	38		1.8	7.5	ug/m3	10	4/2/2013 8:29:00 PM
Benzene	5.5		0.13	0.49	ug/m3	1	4/2/2013 1:17:00 AM
Carbon tetrachloride	0.70	J	0.36	0.96	ug/m3	1	4/2/2013 1:17:00 AM
Chloroform	280		7.9	30	ug/m3	40	4/2/2013 9:03:00 PM
cis-1,2-Dichloroethene	1100		160	480	ug/m3	810	4/3/2013 1:52:00 PM
Ethylbenzene	34		1.9	6.6	ug/m3	10	4/2/2013 8:29:00 PM
Freon 12	2.4		0.20	0.75	ug/m3	1	4/2/2013 1:17:00 AM
Freon 22	3.9		0.18	0.54	ug/m3	1	4/2/2013 1:17:00 AM
m&p-Xylene	280		18	53	ug/m3	40	4/2/2013 9:03:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/2/2013 1:17:00 AM
Methylene chloride	31		1.4	5.3	ug/m3	10	4/2/2013 8:29:00 PM
Naphthalene	22		2.5	8.0	ug/m3	10	4/2/2013 8:29:00 PM
o-Xylene	100		1.9	6.6	ug/m3	10	4/2/2013 8:29:00 PM
Tetrachloroethylene	4.3		0.39	1.0	ug/m3	1	4/2/2013 1:17:00 AM
Toluene	37		1.5	5.7	ug/m3	10	4/2/2013 8:29:00 PM
trans-1,2-Dichloroethene	59		1.9	6.0	ug/m3	10	4/2/2013 8:29:00 PM
Trichloroethene	17000		600	1300	ug/m3	1620	4/3/2013 2:25:00 PM
Vinyl chloride	4.9		0.21	0.39	ug/m3	1	4/2/2013 1:17:00 AM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-DUP1-A-14A
Lab Order:	C1303079	**Tag Number:**	554,
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-005A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	240		11	33	ug/m3	40	4/2/2013 10:09:00 PM
1,1,2-Trichloroethane	3.2		0.20	0.83	ug/m3	1	4/2/2013 1:52:00 AM
1,1-Dichloroethane	1400	J	530	1500	ug/m3	2430	4/3/2013 2:58:00 PM
1,1-Dichloroethene	67000		2100	6000	ug/m3	9720	4/3/2013 3:32:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/2/2013 1:52:00 AM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/2/2013 1:52:00 AM
1,2,4-Trimethylbenzene	0.85		0.23	0.75	ug/m3	1	4/2/2013 1:52:00 AM
1,2-Dichloroethane	29		2.0	6.2	ug/m3	10	4/2/2013 9:36:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/2/2013 1:52:00 AM
Benzene	10		1.3	4.9	ug/m3	10	4/2/2013 9:36:00 PM
Carbon tetrachloride	2.7		0.36	0.96	ug/m3	1	4/2/2013 1:52:00 AM
Chloroform	8.3		0.20	0.74	ug/m3	1	4/2/2013 1:52:00 AM
cis-1,2-Dichloroethene	5200		480	1500	ug/m3	2430	4/3/2013 2:58:00 PM
Ethylbenzene	0.79		0.19	0.66	ug/m3	1	4/2/2013 1:52:00 AM
Freon 12	2.4		0.20	0.75	ug/m3	1	4/2/2013 1:52:00 AM
Freon 22	< 0.54		0.18	0.54	ug/m3	1	4/2/2013 1:52:00 AM
m&p-Xylene	3.2		0.44	1.3	ug/m3	1	4/2/2013 1:52:00 AM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/2/2013 1:52:00 AM
Methylene chloride	< 0.53		0.14	0.53	ug/m3	1	4/2/2013 1:52:00 AM
Naphthalene	2.7		0.25	0.80	ug/m3	1	4/2/2013 1:52:00 AM
o-Xylene	0.97		0.19	0.66	ug/m3	1	4/2/2013 1:52:00 AM
Tetrachloroethylene	64		3.9	10	ug/m3	10	4/2/2013 9:36:00 PM
Toluene	82		1.5	5.7	ug/m3	10	4/2/2013 9:36:00 PM
trans-1,2-Dichloroethene	56		1.9	6.0	ug/m3	10	4/2/2013 9:36:00 PM
Trichloroethene	96000		3400	8200	ug/m3	9720	4/3/2013 3:32:00 PM
Vinyl chloride	310		8.3	16	ug/m3	40	4/2/2013 10:09:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Appendix C

Support Documentation

Centek Chain of Custody

Centek Laboratories
143 Midler Park Drive
Syracuse, NY 13206
315-431-9730
www.CentekLabs.com
Vapor Intrusion & IAQ

Site Name:	Middle River
Project:	SV AND IAQ
PO#:	112IC04792-03
Quote #	Q-1653
Other:	BO3569

Detection Limit	Report Level
☐ 5ppbv	☐ Level I
☒ 1ug/M3	☐ Level II
☐ 1ug/M3 +TCE .25	☒ Cat "B" Like

Turnaround Time:	Check One	Rush TAT Surcharge %	Due Date:
5 Business Days	☒	0%	
4 Business Days	☐	25%	
3 Business Days	☐	50%	
2 Business Days	☐	75%	
Next Day by 5pm	☐	100%	
Next Day by Noon	☐	150%	
Same Day	☐	200%	

Company: Tetra Tech, Inc.

Report to:
Address: 2171 W. Park Court, Suite E
City, State, Zip: Stone Mountain, GA 30087
Email: Eric.Samuels@tetratech.com; Joseph.Samchuck@tetratech.com
Phone: (770) 413-0965

Company:
Check Here If Same: ☒

Invoice to:
Address:
City, State, Zip
Email:
Phone:

Sample ID	Date Sampled	Canister Number	Regulator Number	Analysis Request	Comments TIMES	Vacuum Start/Stop
SV-018-A-14A	3/27/13	98	59	TO15	1036 / 1215	-29 / -4
SV-015-A-14A	3/27/13	357	111	TO15	1048 / 1158	-30 / -2
SV-108-A-14A	3/27/13	133	1167	TO15	1053 / 1201	-28 / 0
SV-118-A-14A	3/27/13	429	176	TO15	1102 / 1207	-30 / 0
SV-DUP1-A-14A	3/27/13	554	—	TO15	— / —	-29 / -3
IA-018-A-14A	3/27/13	1183	271	TO15	0957 / 1802	-30 / -11
IA-116-A-14A	3/27/13	571	262	TO15	1013 / 1808	-28 / 0
IA-138-A-14A	3/27/13	367	296	TO15	1023 / 1818	-30 / -7
IA-093-A-14A	3/27/13	542	180	TO15	1020 / 1816	-28 / -1
IA-DUP1-A-14A	3/27/13	1174	177	TO15	— / —	-30 / -1

Chain of Custody	Print Name	Signature	Date/Time	Courier: CIRCLE ONE
Sampled by:	TONY APANAVAGE		3/27/13 1845	FedEx UPS Pickup/Dropoff
Relinquished by:				For LAB USE ONLY
Received at Lab by:	Jan Scala		3/28/13	Work Order # C1303079

*** By signing Centek Labs Chain of Custody, you are accepting Centek Labs Terms and Conditions listed on the reverse side.

CENTEK LABORATORIES, LLC

Date: *16-Apr-13*

CLIENT: Tetra Tech, Inc.
Project: Middle River
Lab Order: C1303079

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Compendium of Methods for the Determination of Toxic Organic Compounds, Compendium Method TO-15, January 1999 and Centek Laboratories, LLC SOP TS-80:

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objective except as indicated in the corrective action report(s). All samples were received and analyzed within the EPA recommended holding times. Test results are not Method Blank (MB) corrected for contamination.

NYSDEC ASP samples:
Canisters should be evacuated to a reading of less than or equal to 50 millitorr prior to shipment to sampling personnel. The vacuum in the canister will be field checked prior to sampling, and must read 28" of Hg (±2", vacuum, absolute) before a sample can be collected. After the sample has been collected, the pressure of the canister will be read and recorded again, and must be 5" of Hg (±1", vacuum, absolute) for the sample to be valid. Once received at the laboratory, the canister vacuum should be confirmed to be 5" of Hg,±1". Please record and report the pressure/vacuum of received canisters on the sample receipt paperwork. A pressure/vacuum reading should also be taken just prior to the withdrawal of sample from the canister, and recorded on the sample preparation log sheet. All regulators are calibrated to meet these requirements before they leave the laboratory. However, due to environmental conditions and use of the equipment Centek can not guarantee that this criteria can always be achieved.

See Corrective Action: [2714] Missing samples off the COC

Centek Laboratories, LLC

Corrective Action Report

Date Initiated: 28-Mar-13 **Corrective Action Report ID:** 2714

Initiated By: Janice Scala **Department:** LOGIN

Corrective Action Description

CAR Summary: Missing samples off the COC

Description of Nonconformance: Sample IA-138-A-14A (367) & 1A-DUP1-A-14A was listed on COC but was not in sample box

Description of Corrective Action: Spoke to the PM and they located the canisters. Canister 367 & Canister 1174 will arrive 3/29/13 / E. Sammules

Performed By: Janice Scala **Completion Date:** 29-Mar-13

Client Notification

Client Notification Required: Yes **Notified By:** Janice Scala

Comment: Will arrive 3/29/13

Quality Assurance Review

Nonconformance Type: Anomaly

Further Action required by QA: At this time no further corrective action taken

Approval and Closure

Technical Director / Deputy Tech. Dir.: William Dobbin **Close Date:** 28-Mar-13

QA Officer Approval: Russell Pellegrino **QA Date:** 28-Mar-13

Last Updated BY russ2 Updated: 16-Apr-2013 11:37 AM Reported: 16-Apr-2013 11:37 A

CENTEK LABORATORIES, LLC

Date: *16-Apr-13*

CLIENT: Tetra Tech, Inc.
Project: Middle River
Lab Order: C1303079

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
C1303079-001A	SV-018-A-14A	98,59	3/27/2013	3/28/2013
C1303079-002A	SV-015-A-14A	351,111	3/27/2013	3/28/2013
C1303079-003A	SV-108-A-14A	133,1167	3/27/2013	3/28/2013
C1303079-004A	SV-118-A-14A	429,176	3/27/2013	3/28/2013
C1303079-005A	SV-DUP1-A-14A	554,	3/27/2013	3/28/2013
C1303079-006A	IA-018-A-14A	1183,271	3/27/2013	3/28/2013
C1303079-007A	IA-116-A-14A	571,262	3/27/2013	3/28/2013

CLIENT: Tetra Tech, Inc.
Project: Middle River
Lab Order: C1303079

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
C1303079-008A	IA-138-A-14A	367,296	3/27/2013	4/1/2013
C1303079-009A	IA-093-A-14A	542,180	3/27/2013	3/28/2013
C1303079-010A	IA-DUP1-A-14A	1174,177	3/27/2013	4/1/2013

CENTEK LABORATORIES, LLC

Sample Receipt Checklist

Client Name: TETRA TECH - ATLANTA

Date and Time Received 3/28/2013

Work Order Number C1303079

Received by: JDS

Checklist completed by D. Scala 3/28/13 (Signature / Date)

Reviewed by NV 3/28/13 (Initials / 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?	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/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☑	

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section bel

Client contacted: ✓ Date contacted: 3/28/13 Person contacted Rick Samuels

Contacted by: D. Scala Regarding: Missing Samples

Comments: Missing samples on COC

Sample 1A-13B-A-14A & 1A-DUP1-A-14A - listed on COC, but not received

Corrective Action See corrective action report 274

HOLDTIME

SDG C1303079

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV-M3	UG/M3	SV-015-A-14A	C1303079-002A	NM	3/27/2013	4/3/2013	4/3/2013	7	0	7
OV-M3	UG/M3	IA-018-A-14A	C1303079-006A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	IA-093-A-14A	C1303079-009A	NM	3/27/2013	4/1/2013	4/1/2013	5	0	5
OV-M3	UG/M3	IA-093-A-14A	C1303079-009A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	IA-116-A-14A	C1303079-007A	NM	3/27/2013	4/1/2013	4/1/2013	5	0	5
OV-M3	UG/M3	IA-116-A-14A	C1303079-007A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	IA-138-A-14A	C1303079-008A	NM	3/27/2013	4/1/2013	4/1/2013	5	0	5
OV-M3	UG/M3	IA-138-A-14A	C1303079-008A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	IA-DUP1-A-14A	C1303079-010A	NM	3/27/2013	4/1/2013	4/1/2013	5	0	5
OV-M3	UG/M3	IA-018-A-14A	C1303079-006A	NM	3/27/2013	4/1/2013	4/1/2013	5	0	5
OV-M3	UG/M3	SV-015-A-14A	C1303079-002A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	SV-DUP1-A-14A	C1303079-005A	NM	3/27/2013	4/3/2013	4/3/2013	7	0	7
OV-M3	UG/M3	SV-018-A-14A	C1303079-001A	NM	2/27/2013	4/1/2013	4/1/2013	33	0	33
OV-M3	UG/M3	SV-018-A-14A	C1303079-001A	NM	2/27/2013	4/2/2013	4/2/2013	34	0	34
OV-M3	UG/M3	SV-018-A-14A	C1303079-001A	NM	2/27/2013	4/3/2013	4/3/2013	35	0	35

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV-M3	UG/M3	SV-108-A-14A	C1303079-003A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	SV-108-A-14A	C1303079-003A	NM	3/27/2013	4/3/2013	4/3/2013	7	0	7
OV-M3	UG/M3	SV-118-A-14A	C1303079-004A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	SV-118-A-14A	C1303079-004A	NM	3/27/2013	4/3/2013	4/3/2013	7	0	7
OV-M3	UG/M3	SV-DUP1-A-14A	C1303079-005A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6
OV-M3	UG/M3	IA-DUP1-A-14A	C1303079-010A	NM	3/27/2013	4/2/2013	4/2/2013	6	0	6

Field Duplicate Precision

ANALYTE	IA-DUP1-A-14A	IA-018-A-14A	RPD	DIFFERENCE
1,1-DICHLOROETHENE	1.3	1.5	14.29	0.2
BENZENE	0.55	0.58	5.31	0.03
CHLORODIFLUOROMETHANE	1	0.97	3.05	0.03
CIS-1,2-DICHLOROETHENE	ND	0.48	200.00	0.12
DICHLORODIFLUOROMETHANE	2.8	2.7	3.64	0.1
M+P-XYLENES	0.66	1.5	77.78	0.84
METHYLENE CHLORIDE	0.74	0.99	28.90	0.25
NAPHTHALENE	1.3	1	26.09	0.3
TOLUENE	22	57	88.61	35
TRICHLOROETHENE	2.7	3.3	20.00	0.6

ANALYTE	SV-DUP1-A-14A	SV-018-A-14A	RPD	DIFFERENCE
1,1,1-TRICHLOROETHANE	240 (40X)	73 (10X)	106.71	167
1,1,2-TRICHLOROETHANE	3.2	2.1	41.51	1.1
1,1-DICHLOROETHANE	1400 (2430X)	800 (800X)	54.55	600
1,1-DICHLOROETHENE	67000 (9720X)	37000 (3240X)	57.69	30000
1,2,4-TRIMETHYLBENZENE	0.85	ND	200.00	0.1
1,2-DICHLOROETHANE	29	14	69.77	15
BENZENE	10 (10X)	5.2	63.16	4.8
CARBON TETRACHLORIDE	2.7	1.7	45.45	1
CHLOROFORM	8.3	4.3	63.49	4
CIS-1,2-DICHLOROETHENE	5200	4400	16.67	800
DICHLORODIFLUOROMETHANE	2.4	2	18.18	0.4
ETHYLBENZENE	0.79	ND	200.00	0.13
M+P-XYLENES	3.2	1.9	50.98	1.3
NAPHTHALENE	2.7	ND	200.00	1.9
O-XYLENE	0.97	0.44	75.18	0.53
TETRACHLOROETHENE	64	28	78.26	36
TOLUENE	82	36	77.97	46
TRANS-1,2-DICHLOROETHENE	56	26	73.17	30
TRICHLOROETHENE	96000 (9720X)	52000 (7290X)	59.46	44000
VINYL CHLORIDE	310	160	63.83	150

Centek Laboratories, LLC

Injection Log

Directory: C:\HPCHEM\1\DATA

Instrument # 1
Internal Standard Stock # 5491
Standard Stock # 5492
LCS Stock # 5493
Method Ref: EPA TO-15 Jan. 1999

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
221	10	Ak031115.d	1.	C1303012-019A 10X	A305_1UG	11 Mar 2013 21:09
222	10	Ak031116.d	1.	C1303012-023A 10X	A305_1UG	11 Mar 2013 21:42
223	11	Ak031117.d	1.	C1303013-003A 10X	A305_1UG	11 Mar 2013 22:15
224	12	Ak031118.d	1.	C1303013-004A 10X	A305_1UG	11 Mar 2013 22:48
225	13	Ak031119.d	1.	C1303013-005A 10X	A305_1UG	11 Mar 2013 23:21
226	14	Ak031120.d	1.	C1303013-010A 10X	A305_1UG	11 Mar 2013 23:54
227	15	Ak031121.d	1.	C1303013-015A 10X	A305_1UG	12 Mar 2013 00:27
228	16	Ak031122.d	1.	C1303013	A305_1UG-015A 40X	12 Mar 2013 01:00
229	17	Ak031123.d	1.	C1303013-018A 10X	A305_1UG	12 Mar 2013 01:33
230	18	Ak031124.d	1.	C1303013	A305_1UG-018A 40X	12 Mar 2013 02:06
231	19	Ak031125.d	1.	C1303013-019A 10X	A305_1UG	12 Mar 2013 02:38
232	20	Ak031126.d	1.	C1303013	A305_1UG-019A 40X	12 Mar 2013 03:11
233	21	Ak031127.d	1.	ALCS1UGD-031113	A305_1UG	12 Mar 2013 03:44
234	22	Ak031128.d	1.	C1303033-006A 5X	A305_1UG	12 Mar 2013 04:17
235	23	Ak031129.d	1.	C1303033-008A 5X	A305_1UG	12 Mar 2013 04:50
236	24	Ak031130.d	1.	C1303033-001A 5X	A305_1UG	12 Mar 2013 05:23
237	25	Ak031131.d	1.	C1303033-002A 10X	A305_1UG	12 Mar 2013 05:56
238	26	Ak031132.d	1.	C1303033-002A 40X	A305_1UG	12 Mar 2013 06:29
239	27	Ak031133.d	1.	C1303033-003A 10X	A305_1UG	12 Mar 2013 07:02
240	28	Ak031134.d	1.	C1303033-005A 2X	A305_1UG	12 Mar 2013 07:36
241	27	Ak031135.d	1.	C1303033-003A 270X	A305_1UG	12 Mar 2013 08:37
242	28	Ak031136.d	1.	C1303012-014A 90X	A305_1UG	12 Mar 2013 09:10
243	29	Ak031137.d	1.	C1303012-023A 270X	A305_1UG	12 Mar 2013 09:44
244	30	Ak031138.d	1.	C1303012-013A 90X	A305_1UG	12 Mar 2013 10:17
245	31	Ak031139.d	1.	WAC031113A	A305_1UG	12 Mar 2013 10:50
246	31	Ak031140.d	1.	C1303013-015A 90X	A305_1UG	12 Mar 2013 11:24
247		Ak031141.d	1.	No MS or GC data present		
248	1	Ak031301.d	1.	BFB1UG		13 Mar 2013 16:28
249	4	Ak031318.d	1.	A1UG_0.04		14 Mar 2013 01:58
250	5	Ak031319.d	1.	A1UG_		14 Mar 2013 02:30
251	6	Ak031320.d	1.	A1UG_0.10		14 Mar 2013 03:04
252	7	Ak031321.d	1.	A1UG_0.15		14 Mar 2013 03:37
253	8	Ak031322.d	1.	A1UG_		14 Mar 2013 04:11
254	9	Ak031323.d	1.	A1UG_0.30		14 Mar 2013 04:45
255	10	Ak031324.d	1.	A1UG_0.50		14 Mar 2013 05:17
256	11	Ak031325.d	1.	A1UG_0.75		14 Mar 2013 05:51
257	12	Ak031326.d	1.	A1UG_1.0		14 Mar 2013 06:25
258	13	Ak031327.d	1.	A1UG_1.25		14 Mar 2013 06:59
259	14	Ak031328.d	1.	A1UG_1.5		14 Mar 2013 07:35
260	15	Ak031329.d	1.	A1UG_2.0		14 Mar 2013 08:09
261		Ak031330.d	1.	No MS or GC data present		
262	1	Ak031401.d	1.	BFB1UG		14 Mar 2013 08:49
263	2	Ak031402.d	1.	A1UG_1.0		14 Mar 2013 09:38
264	3	Ak031403.d	1.	ALCS1UG-031413		14 Mar 2013 10:12
265	4	Ak031404.d	1.	AMB1UG-031413		14 Mar 2013 10:46
266	5	Ak031405.d	1.	PROF		14 Mar 2013 11:19
267	6	Ak031406.d	1.	PROF 10X		14 Mar 2013 11:52
268	7	Ak031407.d	1.	PROF 40X		14 Mar 2013 12:26
269	1	Ak031408.d	1.	WAC031413A		14 Mar 2013 12:58
270	2	Ak031409.d	1.	WAC031413B		14 Mar 2013 13:32
271	3	Ak031410.d	1.	WAC031413C		14 Mar 2013 14:05
272	4	Ak031411.d	1.	WAC031413D		14 Mar 2013 15:38
273	2	Ak031412.d	1.	WAC031413E		14 Mar 2013 16:11
274	3	Ak031413.d	1.	WAC031413F		14 Mar 2013 16:44
275	4	Ak031414.d	1.	WAC031413G		14 Mar 2013 17:17

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Directory: C:\HPCHEM\1\DATA2

Injection Log

Instrument # 1
Internal Standard Stock # 9576 9531
Standard Stock # 9577 9530
LCS Stock # 9574 9533
Method Ref: EPA TO-15 Jan. 1999

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
606	2	Ak032808.d	1.	C1303075-003A	A313_UGM3	28 Mar 2013 14:45
607	3	Ak032809.d	1.	C1303075-004A	A313_UGM3	28 Mar 2013 15:18
608	4	Ak032810.d	1.	C1303075-005A	A313_UGM3	28 Mar 2013 15:56
609	5	Ak032811.d	1.	C1303075-	A313_UGM3	28 Mar 2013 16:30
610	6	Ak032812.d	1.	C1303075-007A	A313_UGM3	28 Mar 2013 17:17
611	6	Ak032813.d	1.	C1303075-008A	A313_UGM3	28 Mar 2013 17:50
612	7	Ak032814.d	1.	C1303075-002A	A313_UGM3	28 Mar 2013 18:24
613	8	Ak032815.d	1.	C1303075-006A	A313_UGM3	28 Mar 2013 18:57
614	9	Ak032816.d	1.	C1303075-001A 10X	A313_UGM3	28 Mar 2013 19:30
615	10	Ak032817.d	1.	C1303075-003A 10X	A313_UGM3	28 Mar 2013 20:04
616	11	Ak032818.d	1.	C1303075-004A 10X	A313_UGM3	28 Mar 2013 20:37
617	12	Ak032819.d	1.	C1303075-005A 10X	A313_UGM3	28 Mar 2013 21:11
618	13	Ak032820.d	1.	C1303075-007A 10X	A313_UGM3	28 Mar 2013 21:44
619	14	Ak032821.d	1.	C1303075-008A 10X	A313_UGM3	28 Mar 2013 22:17
620	15	Ak032822.d	1.	C1303075-002A 10X	A313_UGM3	28 Mar 2013 22:50
621	16	Ak032823.d	1.	C1303075	A313_UGM3-002A 40X	28 Mar 2013 23:23
622	17	Ak032824.d	1.	C1303075-006A 10X	A313_UGM3	28 Mar 2013 23:56
623	18	Ak032825.d	1.	C1303075	A313_UGM3-006A 40X	29 Mar 2013 00:28
624	19	Ak032826.d	1.	ALCS1UGD-032813	A313_UGM3	29 Mar 2013 01:02
625	20	Ak032827.d	1.	C1303081-001A	A313_UGM3	29 Mar 2013 01:35
626	21	Ak032828.d	1.	C1303081-002A	A313_UGM3	29 Mar 2013 02:09
627	22	Ak032829.d	1.	C1303081-003A	A313_UGM3	29 Mar 2013 02:44
628	23	Ak032830.d	1.	C1303081-003A 10X	A313_UGM3	29 Mar 2013 03:17
629	24	Ak032831.d	1.	C1303081	A313_UGM3-003A 40X	29 Mar 2013 03:50
630	25	Ak032832.d	1.	C1303081	A313_UGM3-001A 10X	29 Mar 2013 04:24
631	26	Ak032833.d	1.	C1303081	A313_UGM3-002A 5X	29 Mar 2013 04:57
632	27	Ak032834.d	1.	blk	A313_UGM3	29 Mar 2013 05:30
633	28	Ak032835.d	1.	WAC032813A	A313_UGM3	29 Mar 2013 06:03
634	29	Ak032836.d	1.	WAC032813B	A313_UGM3	29 Mar 2013 06:37
635	23	Ak032837.d	1.	C1303075-002A 40X	A313_UGM3	29 Mar 2013 07:21
636	24	Ak032838.d	1.	C1303081-003A 90X	A313_UGM3	29 Mar 2013 08:46
637		Ak032839.d	1.	No MS or GC data present		
638	1	Ak032901.d	1.	BFB1UG	A313_UGM3	29 Mar 2013 09:31
639	2	Ak032902.d	1.	A1UG_1.0	A313_UGM3	29 Mar 2013 10:09
640	3	Ak032903.d	1.	ALCS1UG-032913	A313_UGM3	29 Mar 2013 10:43
641	4	Ak032904.d	1.	AMB1UG-032913	A313_UGM3	29 Mar 2013 11:16
642	5	Ak032905.d	1.	C1303082-018A	A313_UGM3	29 Mar 2013 12:03
643	6	Ak032906.d	1.	C1303082-003A	A313_UGM3	29 Mar 2013 12:38
644	7	Ak032907.d	1.	C1303082-003A MS	A313_UGM3	29 Mar 2013 13:13
645	8	Ak032908.d	1.	C1303082-003A MSD	A313_UGM3	29 Mar 2013 13:49
646	5	Ak032909.d	1.	C1303082-002A	A313_UGM3	29 Mar 2013 14:23
647	6	Ak032910.d	1.	C1303082-005A	A313_UGM3	29 Mar 2013 14:56
648	7	Ak032911.d	1.	C1303082-006A	A313_UGM3	29 Mar 2013 15:30
649	8	Ak032912.d	1.	C1303082-008A	A313_UGM3	29 Mar 2013 16:06
650	9	Ak032913.d	1.	C1303082-010A	A313_UGM3	29 Mar 2013 16:41
651	10	Ak032914.d	1.	C1303082-012A	A313_UGM3	29 Mar 2013 17:15
652	11	Ak032915.d	1.	C1303082-013A	A313_UGM3	29 Mar 2013 17:49
653	12	Ak032916.d	1.	C1303082-015A	A313_UGM3	29 Mar 2013 18:22
654	13	Ak032917.d	1.	C1303082-017A	A313_UGM3	29 Mar 2013 19:00
655	12	Ak032918.d	1.	C1303082-001A	A313_UGM3	29 Mar 2013 19:33
656	41	Ak032919.d	1.	C1303082-004A	A313_UGM3	29 Mar 2013 20:06
657	42	Ak032920.d	1.	C1303082-007A	A313_UGM3	29 Mar 2013 20:41
658	43	Ak032921.d	1.	C1303082-009A	A313_UGM3	29 Mar 2013 21:14
659	44	Ak032922.d	1.	C1303082	A313_UGM3-011A	29 Mar 2013 21:53
660	45	Ak032923.d	1.	C1303082-014A	A313_UGM3	29 Mar 2013 22:28

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Injection Log

Instrument # 1
Internal Standard Stock # 7531
Standard Stock # 5530
LCS Stock # 5532

Method Ref. EPA TO-15 Jan. 1999

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
661	46	Ak032924.d	1.	C1303082-016A	A313_UGM3	29 Mar 2013 23:04
662	47	Ak032925.d	1.	ALCS1UGD-032913	A313_UGM3	29 Mar 2013 23:40
663	48	Ak032926.d	1.	C1303083-001A	A313_UGM3	30 Mar 2013 00:16
664	49	Ak032927.d	1.	C1303083-002A	A313_UGM3	30 Mar 2013 00:53
665	50	Ak032928.d	1.	C1303083-003A	A313_UGM3	30 Mar 2013 01:28
666	51	Ak032929.d	1.	C1303083-004A	A313_UGM3	30 Mar 2013 02:04
667	52	Ak032930.d	1.	C1303083-005A	A313_UGM3	30 Mar 2013 02:40
668	53	Ak032931.d	1.	C1303083-006A	A313_UGM3	30 Mar 2013 03:16
669		Ak032942.d	1.	No MS or GC data present		
670	1	Ak033001.d	1.	BFB1UG	A313_UGM3	30 Mar 2013 10:05
671	3	Ak033002.d	1.	A1UG_1.0	A313_UGM3	30 Mar 2013 12:33
672	4	Ak033003.d	1.	ALCS1UG-033013	A313_UGM3	30 Mar 2013 13:09
673	6	Ak033004.d	1.	AMB1UG-033013	A313_UGM3	30 Mar 2013 13:43
674	7	Ak033005.d	1.	WAC033013A	A313_UGM3	30 Mar 2013 16:47
675	8	Ak033006.d	1.	WAC033013B n	A313_UGM3	30 Mar 2013 17:23
676	9	Ak033007.d	1.	WAC033013C n	A313_UGM3	30 Mar 2013 17:59
677	10	Ak033008.d	1.	WAC033013D n	A313_UGM3	30 Mar 2013 18:35
678	11	Ak033009.d	1.	C1303082-003A 2X	A313_UGM3	30 Mar 2013 19:09
679	12	Ak033010.d	1.	C1303082-002A 10X	A313_UGM3	30 Mar 2013 19:43
680	13	Ak033011.d	1.	C1303082-005A 10X	A313_UGM3	30 Mar 2013 20:18
681	14	Ak033012.d	1.	C1303082-006A 10X	A313_UGM3	30 Mar 2013 20:52
682	15	Ak033013.d	1.	C1303082-008A 10X	A313_UGM3	30 Mar 2013 21:27
683	16	Ak033014.d	1.	C1303082-010A 10X	A313_UGM3	30 Mar 2013 22:01
684	17	Ak033015.d	1.	C1303082-012A 10X	A313_UGM3	30 Mar 2013 22:36
685	18	Ak033016.d	1.	C1303082-013A 10X	A313_UGM3	30 Mar 2013 23:10
686	19	Ak033017.d	1.	C1303082-015A 10X	A313_UGM3	30 Mar 2013 23:44
687	20	Ak033018.d	1.	C1303082-017A 10X	A313_UGM3	31 Mar 2013 00:20
688	21	Ak033019.d	1.	C1303082-001A 10X	A313_UGM3	31 Mar 2013 00:54
689	22	Ak033020.d	1.	C1303082-001A 90X	A313_UGM3	31 Mar 2013 01:28
690	23	Ak033021.d	1.	C1303082-004A 10X	A313_UGM3	31 Mar 2013 02:03
691	24	Ak033022.d	1.	C1303082-004A 90X	A313_UGM3	31 Mar 2013 02:37
692	25	Ak033023.d	1.	C1303082-007A 10X	A313_UGM3	31 Mar 2013 03:11
693	26	Ak033024.d	1.	C1303082-007A 90X	A313_UGM3	31 Mar 2013 03:45
694	27	Ak033025.d	1.	C1303082-009A 10X	A313_UGM3	31 Mar 2013 04:20
695	28	Ak033026.d	1.	C1303082-009A 90X	A313_UGM3	31 Mar 2013 04:54
696	29	Ak033027.d	1.	C1303082-014A 10X	A313_UGM3	31 Mar 2013 05:28
697	30	Ak033028.d	1.	C1303082-016A 10X	A313_UGM3	31 Mar 2013 06:02
698	31	Ak033029.d	1.	C1303082-016A 40X	A313_UGM3	31 Mar 2013 06:37
699	32	Ak033030.d	1.	ALCS1UGD-033013	A313_UGM3	31 Mar 2013 07:13
700		Ak033031.d	1.	No MS or GC data present		

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
1)	I	Bromochloromethane	----------		ISTD	----------				
2)	T	Freon 22			3.081	2.495	2.258	2.251	2.318	14.51
3)	T	Propylene			0.902	0.799	0.840	0.745	0.750	11.67
4)	T	Freon 12			6.430	5.238	4.955	4.831	4.997	12.39
5)	T	Chloromethane			1.576	1.477	1.232	1.226	1.260	14.29
6)	T	Freon 114			4.946	4.059	3.737	3.681	3.803	13.25
7)	T	Vinyl Chloride	1.539	1.228	1.254	1.180	1.065	1.076	1.130	15.65
8)	T	1,3-butadiene			0.931	0.818	0.703	0.790	0.796	11.00
9)	T	Bromomethane			1.682	1.356	1.335	1.286	1.314	12.22
10)	T	Ethanol				0.297	0.301	0.267	0.267	11.24
11)	T	Acrolein			0.348	0.266	0.253	0.316	0.268	15.80
12)	T	Chloroethane			0.598	0.607	0.515	0.503	0.507	12.58
13)	T	Vinyl Bromide			1.779	1.426	1.436	1.387	1.388	12.57
14)	T	Freon 11			7.033	5.436	5.167	5.090	5.257	14.29
15)	T	Acetone				0.494	0.434	0.464	0.435	8.75
16)	T	Isopropyl alcoh			1.606	1.386	1.334	1.364	1.284	13.47
17)	T	1,1-dichloroeth			1.403	1.317	1.136	1.106	1.151	11.64
18)	T	Freon 113			3.698	2.902	2.731	2.739	2.759	14.84
19)	t	t-Butyl alcohol			2.837	2.073	2.026	1.999	2.053	16.43
20)	T	Methylene chlor			1.210	1.099	0.999	0.939	0.968	13.24
21)	T	Allyl chloride			1.877	1.966	1.500	1.482	1.546	15.52
22)	T	Carbon disulfid			4.597	3.489	3.093	3.120	3.221	18.55
23)	T	trans-1,2-dichl			2.028	1.600	1.480	1.589	1.584	11.75
24)	T	methyl tert-but			3.872	3.220	2.988	2.808	3.063	11.56
25)	T	1,1-dichloroeth			3.052	2.440	2.194	2.322	2.323	13.53
26)	T	Vinyl acetate			2.495	1.506	1.629	1.914	1.790	17.55
27)	T	Methyl Ethyl Ke				0.366	0.396	0.398	0.379	4.47
28)	T	cis-1,2-dichlor			1.896	1.355	1.459	1.335	1.439	13.09
29)	T	Hexane			1.592	1.227	1.174	1.282	1.268	10.97
30)	T	Ethyl acetate			2.170	1.847	1.715	1.754	1.802	8.91
31)	T	Chloroform			4.440	3.414	3.311	3.200	3.318	14.33
32)	T	Tetrahydrofuran			0.952	0.885	0.776	0.747	0.780	11.53
33)	T	1,2-dichloroeth			2.949	2.320	2.209	2.204	2.258	12.92
34)	I	1,4-difluorobenzene	----------		ISTD	----------				
35)	T	1,1,1-trichloro			1.691	1.197	1.110	1.124	1.155	19.49
36)	T	Cyclohexane			0.454	0.362	0.344	0.347	0.364	10.62
37)	T	Carbon tetrachl	2.306	1.702	1.954	1.379	1.339	1.321	1.492	25.15
38)	T	Benzene			1.169	0.940	0.930	0.890	0.910	12.50
39)	T	Methyl methacry			0.372	0.258	0.260	0.273	0.277	14.13
40)	T	1,4-dioxane				0.129	0.111	0.112	0.113	6.79
41)	T	2,2,4-trimethyl			1.581	1.160	1.122	1.111	1.175	14.30
42)	T	Heptane			0.557	0.386	0.375	0.349	0.389	17.92
43)	T	Trichloroethene	0.771	0.585	0.694	0.512	0.490	0.476	0.541	20.17
44)	T	1,2-dichloropro			0.469	0.354	0.351	0.341	0.350	14.45
45)	T	Bromodichlorome			1.483	1.087	1.074	1.029	1.076	15.84
46)	T	cis-1,3-dichlor			0.661	0.457	0.457	0.467	0.482	15.14
47)	T	trans-1,3-dichl			0.564	0.407	0.452	0.422	0.455	10.95
48)	T	1,1,2-trichloro			0.657	0.492	0.488	0.454	0.485	14.88
49)	I	Chlorobenzene-d5	----------		ISTD	----------				
50)	T	Toluene			0.844	0.608	0.629	0.623	0.648	12.47
51)	T	Methyl Isobutyl				0.475	0.458	0.455	0.432	8.76

(#) = Out of Range ### Number of calibration levels exceeded format ###

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
52)	T	Dibromochlorome			1.638	1.173	1.108	1.073	1.141	18.20
53)	T	Methyl Butyl Ke				0.318	0.302	0.288	0.289	7.94
54)	T	1,2-dibromoetha			1.038	0.716	0.742	0.742	0.753	15.64
55)	T	Tetrachloroethy	1.204	0.802	0.927	0.662	0.660	0.642	0.728	27.38
56)	T	Chlorobenzene			1.422	1.010	1.025	1.004	1.038	15.23
57)	T	Ethylbenzene			1.717	1.238	1.329	1.351	1.395	10.54
58)	T	m&p-xylene			1.264	0.940	1.018	1.089	1.120	10.07
59)	T	Styrene			0.755	0.574	0.644	0.657	0.683	9.97
60)	T	Bromoform			1.415	1.046	1.061	1.055	1.065	13.71
61)	T	o-xylene			1.767	1.273	1.367	1.476	1.471	12.17
62)	S	Bromofluorobenz	0.528	0.511	0.561	0.568	0.580	0.584	0.572	5.48
63)	T	1,1,2,2-tetrach			1.298	0.917	0.953	0.967	0.978	13.44
64)	T	2-Chlorotoluene			1.513	1.121	1.058	1.073	1.138	14.08
65)	T	4-ethyltoluene			1.164	0.928	0.960	1.063	1.116	11.90
66)	T	1,3,5-trimethyl			1.779	1.363	1.450	1.435	1.516	8.44
67)	T	1,2,4-trimethyl			1.145	0.850	0.974	1.050	1.095	14.38
68)	T	1,3-dichloroben			0.961	0.731	0.825	0.894	0.895	10.72
69)	T	benzyl chloride			0.946	0.662	0.675	0.698	0.794	14.70
70)	T	1,4-dichloroben			0.894	0.746	0.750	0.822	0.850	11.35
71)	T	1,2,3-trimethyl			1.335	1.032	1.121	1.227	1.298	14.02
72)	T	1,2-dichloroben			1.048	0.805	0.859	0.921	0.920	9.22
73)	T	1,2,4-trichloro			0.551	0.576	0.492	0.500	0.541	10.80
74)	T	Naphthalene			0.975	0.854	0.741	0.812	0.859	10.87
75)	T	Hexachloro-1,3-			1.135	0.863	0.991	0.923	0.947	9.68

(#) = Out of Range ### Number of calibration levels exceeded format ###

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Directory: C:\HPCHEM\1\DATA

Injection Log

Instrument # 1
Internal Standard Stock # 5531
Standard Stock # 5530
LCS Stock #
Method Ref: EPA TO-15/Jr

Injected 5532

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	Ak040101.d	1.	BFB1UG	A313_UGM3	1 Apr 2013 09:38
2	2	Ak040102.d	1.	A1UG	A313_UGM3	1 Apr 2013 10:17
3	3	Ak040103.d	1.	A1UG_1.0	A313_UGM3	1 Apr 2013 11:08 ✓
4	4	Ak040104.d	1.	ALCS1UG-040113	A313_UGM3	1 Apr 2013 11:42
5	5	Ak040105.d	1.	AMB1UG-040113	A313_UGM3	1 Apr 2013 12:16
6	1	Ak040106.d	1.	WAC040113A	A313_UGM3	1 Apr 2013 12:53
7	2	Ak040107.d	1.	WAC040113B	A313_UGM3	1 Apr 2013 13:27
8	3	Ak040108.d	1.	WAC040113C	A313_UGM3	1 Apr 2013 14:02
9	4	Ak040109.d	1.	WAC040113D	A313_UGM3	1 Apr 2013 14:35
10	5	Ak040110.d	1.	WAC040113E	A313_UGM3	1 Apr 2013 15:08
11	6	Ak040111.d	1.	WAC040113F	A313_UGM3	1 Apr 2013 15:42
12	7	Ak040112.d	1.	WAC040113G	A313_UGM3	1 Apr 2013 16:39
13	8	Ak040113.d	1.	WAC040113H	A313_UGM3	1 Apr 2013 17:14
14	3	Ak040114.d	1.	C1304005-001A	A313_UGM3	1 Apr 2013 17:47
15	4	Ak040115.d	1.	C1304005-002A	A313_UGM3	1 Apr 2013 18:21
16	5	Ak040116.d	1.	C1304005-003A	A313_UGM3	1 Apr 2013 18:55
17	6	Ak040117.d	1.	C1304005-004A	A313_UGM3	1 Apr 2013 19:28
18	7	Ak040118.d	1.	C1304005-005A	A313_UGM3	1 Apr 2013 20:02
19	8	Ak040119.d	1.	C1303079-006A	A313_UGM3	1 Apr 2013 20:37
20	9	Ak040120.d	1.	C1303079-007A	A313_UGM3	1 Apr 2013 21:12
21	10	Ak040121.d	1.	C1303079-008A	A313_UGM3	1 Apr 2013 21:46
22	11	Ak040122.d	1.	C1303079-009A	A313_UGM3	1 Apr 2013 22:21
23	12	Ak040123.d	1.	C1303079-010A	A313_UGM3	1 Apr 2013 22:56
24	41	Ak040124.d	1.	C1303079-001A	A313_UGM3	1 Apr 2013 23:30
25	42	Ak040125.d	1.	C1303079-002A	A313_UGM3	2 Apr 2013 00:06
26	43	Ak040126.d	1.	C1303079-003A	A313_UGM3	2 Apr 2013 00:41
27	44	Ak040127.d	1.	C1303079-004A	A313_UGM3	2 Apr 2013 01:17
28	45	Ak040128.d	1.	C1303079-005A	A313_UGM3	2 Apr 2013 01:52
29	46	Ak040129.d	1.	C1304001-003A	A313_UGM3	2 Apr 2013 02:28
30	47	Ak040130.d	1.	C1304001-004A	A313_UGM3	2 Apr 2013 03:03
31	48	Ak040131.d	1.	C1304001-001A	A313_UGM3	2 Apr 2013 03:39
32	49	Ak040132.d	1.	C1304001-002A	A313_UGM3	2 Apr 2013 04:14
33	50	Ak040133.d	1.	ALCS1UGD-040113	A313_UGM3	2 Apr 2013 04:50
34	51	Ak040134.d	1.	C1303079-006A 10x	A313_UGM3	2 Apr 2013 05:24
35	52	Ak040135.d	1.	C1303079-007A 10x	A313_UGM3	2 Apr 2013 05:59
36	53	Ak040136.d	1.	C1303079-008A 10x	A313_UGM3	2 Apr 2013 06:33
37	54	Ak040137.d	1.	C1303079-009A 10x	A313_UGM3	2 Apr 2013 07:07
38	55	Ak040138.d	1.	C1303079-010A 10x	A313_UGM3	2 Apr 2013 07:42
39	56	Ak040139.d	1.	C1303079-001A 10x	A313_UGM3	2 Apr 2013 08:17
40	57	Ak040140.d	1.	C1303079-002A 10x	A313_UGM3	2 Apr 2013 08:51
41	58	Ak040141.d	1.	C1303079-003A 10x	A313_UGM3	2 Apr 2013 09:24
42	59	Ak040142.d	1.	C1303079-004A 10x	A313_UGM3	2 Apr 2013 09:57
43		Ak040143.d	1.	No MS or GC data present		
44	1	Ak040201.d	1.	BFB1UG	A313_UGM3	2 Apr 2013 13:01
45	2	Ak040202.d	1.	A1UG_1.0	A313_UGM3	2 Apr 2013 13:47
46	3	Ak040203.d	1.	ALCS1UG-040213	A313_UGM3	2 Apr 2013 14:20
47	4	Ak040204.d	1.	AMB1UG-040213	A313_UGM3	2 Apr 2013 14:53
48	1	Ak040205.d	1.	C1304005-001A 10x	A313_UGM3	2 Apr 2013 16:03
49	2	Ak040206.d	1.	C1304005-002A 10x	A313_UGM3	2 Apr 2013 16:35
50	3	Ak040207.d	1.	C1304005-003A 10x	A313_UGM3	2 Apr 2013 17:09
51	4	Ak040208.d	1.	C1304005-004A 10x	A313_UGM3	2 Apr 2013 17:42
52	5	Ak040209.d	1.	C1304005-005A 10x	A313_UGM3	2 Apr 2013 18:14
53	6	Ak040210.d	1.	C1303079-001A 40x	A313_UGM3	2 Apr 2013 18:48
54	7	Ak040211.d	1.	C1303079-002A 40x	A313_UGM3	2 Apr 2013 19:21
55	8	Ak040212.d	1.	C1303079-003A 40x	A313_UGM3	2 Apr 2013 19:55

Centek Laboratories, LLC

Directory: C:\HPCHEM\1\DATA

Injection Log

Instrument # 1
Internal Standard Stock # 5531
Standard Stock # 5530
Misc Info Stock # 5532 Injected
Method Ref: EPA TO-15 / Jan. 1[illegible]

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
56	9	Ak040213.d	1.	C1303079-004A 10x	A313_UGM3	2 Apr 2013 20:29
57	10	Ak040214.d	1.	C1303079-004A 40x	A313_UGM3	2 Apr 2013 21:03
58	11	Ak040215.d	1.	C1303079-005A 10x	A313_UGM3	2 Apr 2013 21:36
59	12	Ak040216.d	1.	C1303079-005A 40x	A313_UGM3	2 Apr 2013 22:09
60	13	Ak040217.d	1.	C1304001-003A 10x	A313_UGM3	2 Apr 2013 22:42
61	14	Ak040218.d	1.	C1304001-004A 10x	A313_UGM3	2 Apr 2013 23:15
62	15	Ak040219.d	1.	C1304001-001A 10x	A313_UGM3	2 Apr 2013 23:48
63	16	Ak040220.d	1.	C1304001-001A 40x	A313_UGM3	3 Apr 2013 00:22
64	17	Ak040221.d	1.	C1304001-002A 10x	A313_UGM3	3 Apr 2013 00:57
65	18	Ak040222.d	1.	C1304001-002A 40x	A313_UGM3	3 Apr 2013 01:31
66	19	Ak040223.d	1.	ALCS1UGD-040213	A313_UGM3	3 Apr 2013 02:06
67		Ak040224.d	1.	No MS or GC data present		
68	1	Ak040301.d	1.	BFB1UG	A313_UGM3	3 Apr 2013 08:37
69	2	Ak040302.d	1.	A1UG_1.0	A313_UGM3	3 Apr 2013 09:19 ✓
70	3	Ak040303.d	1.	ALCS1UG-040313	A313_UGM3	3 Apr 2013 09:58
71	4	Ak040304.d	1.	AMB1UG-040313	A313_UGM3	3 Apr 2013 10:31
72	5	Ak040305.d	1.	C1303079-001A 810X	A313_UGM3	3 Apr 2013 11:38
73	6	Ak040306.d	1.	C1303079-001A 7290X	A313_UGM3	3 Apr 2013 12:12
74	7	Ak040307.d	1.	C1303079-002A 810X	A313_UGM3	3 Apr 2013 12:45
75	9	Ak040308.d	1.	C1303079-003A 810X	A313_UGM3	3 Apr 2013 13:19
76	10	Ak040309.d	1.	C1303079-004A 810X	A313_UGM3	3 Apr 2013 13:52
77	11	Ak040310.d	1.	C1303079-004A 1620X	A313_UGM3	3 Apr 2013 14:25
78	11	Ak040311.d	1.	C1303079-005A 2430X	A313_UGM3	3 Apr 2013 14:58
79	12	Ak040312.d	1.	C1303079-005A 9720X	A313_UGM3	3 Apr 2013 15:32
80	12	Ak040313.d	1.	C1303079-003A 1620X	A313_UGM3	3 Apr 2013 16:05
81	14	Ak040314.d	1.	form	A313_UGM3	3 Apr 2013 17:29
82	16	Ak040315.d	1.	C1304012-001A 10X	A313_UGM3	3 Apr 2013 17:58
83	17	Ak040316.d	1.	C1304012-001A 40X	A313_UGM3	3 Apr 2013 18:32
84	18	Ak040317.d	1.	C1304012-001A	A313_UGM3	3 Apr 2013 19:06
85	18	Ak040318.d	1.	C1304012-001A 810x	A313_UGM3	4 Apr 2013 08:00
86	20	Ak040319.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 20:13
87	21	Ak040320.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 20:47
88	22	Ak040321.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 21:20
89	23	Ak040322.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 21:53
90	24	Ak040323.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 22:26
91	25	Ak040324.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 23:00
92	26	Ak040325.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 23:34
93	27	Ak040326.d	1.	FORM h2o	A313_UGM3	4 Apr 2013 00:09
94	1	Ak040401.d	1.	BFB1UG	A313_UGM3	4 Apr 2013 08:37
95	2	Ak040402.d	1.	A1UG	A313_UGM3	4 Apr 2013 09:15
96	3	Ak040403.d	1.	A1UG	A313_UGM3	4 Apr 2013 09:57
97	4	Ak040404.d	1.	WAC040413A N	A313_UGM3	4 Apr 2013 10:43
98	5	Ak040405.d	1.	WAC040413B	A313_UGM3	4 Apr 2013 11:17
99	6	Ak040406.d	1.	WAC040413C	A313_UGM3	4 Apr 2013 11:50
100	7	Ak040407.d	1.	WAC040413D	A313_UGM3	4 Apr 2013 12:23
101	8	Ak040408.d	1.	WAC040413E	A313_UGM3	4 Apr 2013 12:57
102	9	Ak040409.d	1.	WAC040413F	A313_UGM3	4 Apr 2013 13:33
103		Ak040410.d	1.	No MS or GC data present		
104	31	Ak040501.d	1.	BFBFORM		5 Apr 2013 08:22
105	31	Ak040502.d	1.	AFORM100		5 Apr 2013 09:11
106	32	Ak040503.d	1.	AFORM75		5 Apr 2013 09:46
107	33	Ak040504.d	1.	AFORM50		5 Apr 2013 10:20
108	34	Ak040505.d	1.	AFORM25		5 Apr 2013 10:53
109	35	Ak040506.d	1.	AFORM10		5 Apr 2013 11:26
110	36	Ak040507.d	1.	ALCSF-040513		5 Apr 2013 11:59

Data File : C:\HPCHEM\1\DATA\AK040103.D Vial: 3
Acq On : 1 Apr 2013 11:08 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Tue Apr 09 08:54:34 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane	1.000	1.000	0.0	156#	0.00
2	T	Freon 22	2.318	2.422	-4.5	175#	0.00
3	T	Propylene	0.750	0.662	11.7	153#	0.00
4	T	Freon 12	4.997	5.079	-1.6	171#	0.00
5	T	Chloromethane	1.260	1.315	-4.4	179#	0.00
6	T	Freon 114	3.803	4.029	-5.9	181#	0.00
7	T	Vinyl Chloride	1.130	1.085	4.0	172#	0.00
8	T	1,3-butadiene	0.796	0.779	2.1	139	0.00
9	T	Bromomethane	1.314	1.338	-1.8	173#	0.00
10	T	Ethanol	0.267	0.236	11.6	142	0.00
11	T	Acrolein	0.268	0.243	9.3	159#	0.00
12	T	Chloroethane	0.507	0.515	-1.6	172#	0.00
13	T	Vinyl Bromide	1.388	1.462	-5.3	178#	0.00
14	T	Freon 11	5.257	5.786	-10.1	185#	0.00
15	T	Acetone	0.435	0.464	-6.7	183#	0.00
16	T	Isopropyl alcohol	1.284	1.217	5.2	164#	0.00
17	T	1,1-dichloroethene	1.151	1.204	-4.6	178#	0.00
18	T	Freon 113	2.759	2.963	-7.4	182#	0.00
19	t	t-Butyl alcohol	2.053	1.819	11.4	152#	0.00
20	T	Methylene chloride	0.968	1.054	-8.9	182#	0.00
21	T	Allyl chloride	1.546	1.414	8.5	164#	0.00
22	T	Carbon disulfide	3.221	3.287	-2.0	180#	0.00
23	T	trans-1,2-dichloroethene	1.584	1.525	3.7	160#	0.00
24	T	methyl tert-butyl ether	3.063	2.192	28.4	116	0.00
25	T	1,1-dichloroethane	2.323	2.221	4.4	160#	0.00
26	T	Vinyl acetate	1.790	1.414	21.0	132	0.00
27	T	Methyl Ethyl Ketone	0.379	0.311	17.9	128	0.00
28	T	cis-1,2-dichloroethene	1.439	1.198	16.7	135	0.00
29	T	Hexane	1.268	1.053	17.0	143	0.00
30	T	Ethyl acetate	1.802	1.498	16.9	141	0.00
31	T	Chloroform	3.318	3.260	1.7	166#	0.00
32	T	Tetrahydrofuran	0.780	0.575	26.3	123	0.00
33	T	1,2-dichloroethane	2.258	2.088	7.5	154#	0.00
34	I	1,4-difluorobenzene	1.000	1.000	0.0	130	0.00
35	T	1,1,1-trichloroethane	1.155	1.306	-13.1	163#	0.00
36	T	Cyclohexane	0.364	0.356	2.2	135	0.00
37	T	Carbon tetrachloride	1.492	1.592	-6.7	165#	0.00
38	T	Benzene	0.910	0.967	-6.3	148	0.00
39	T	Methyl methacrylate	0.277	0.221	20.2	114	0.00
40	T	1,4-dioxane	0.113	0.099	12.4	123	0.00
41	T	2,2,4-trimethylpentane	1.175	1.210	-3.0	144	0.00
42	T	Heptane	0.389	0.395	-1.5	144	0.00
43	T	Trichloroethene	0.541	0.538	0.6	151#	0.00
44	T	1,2-dichloropropane	0.350	0.407	-16.3	164#	0.00
45	T	Bromodichloromethane	1.076	1.235	-14.8	162#	0.00
46	T	cis-1,3-dichloropropene	0.482	0.426	11.6	125	0.00
47	T	trans-1,3-dichloropropene	0.455	0.404	11.2	122	0.00
48	T	1,1,2-trichloroethane	0.485	0.531	-9.5	153#	0.00
49	I	Chlorobenzene-d5	1.000	1.000	0.0	142	0.00

(#) = Out of Range

Data File : C:\HPCHEM\1\DATA\AK040103.D Vial: 3
Acq On : 1 Apr 2013 11:08 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Tue Apr 09 08:54:34 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
50	T	Toluene	0.648	0.552	14.8	125	0.00
51	T	Methyl Isobutyl Ketone	0.432	0.379	12.3	138	0.00
52	T	Dibromochloromethane	1.141	1.084	5.0	145	0.00
53	T	Methyl Butyl Ketone	0.289	0.302	-4.5	163#	0.00
54	T	1,2-dibromoethane	0.753	0.694	7.8	140	0.00
55	T	Tetrachloroethylene	0.728	0.603	17.2	139	0.00
56	T	Chlorobenzene	1.038	0.920	11.4	134	0.00
57	T	Ethylbenzene	1.395	1.116	20.0	119	0.00
58	T	m&p-xylene	1.120	0.965	13.8	124	0.00
59	T	Styrene	0.683	0.544	20.4	116	0.00
60	T	Bromoform	1.065	0.873	18.0	126	0.00
61	T	o-xylene	1.471	1.272	13.5	144	0.00
62	S	Bromofluorobenzene	0.572	0.530	7.3	127	0.00
63	T	1,1,2,2-tetrachloroethane	0.978	0.978	0.0	151#	0.00
64	T	2-Chlorotoluene	1.138	0.951	16.4	131	0.00
65	T	4-ethyltoluene	1.116	0.978	12.4	126	0.00
66	T	1,3,5-trimethylbenzene	1.516	1.296	14.5	127	0.00
67	T	1,2,4-trimethylbenzene	1.095	0.829	24.3	112	0.00
68	T	1,3-dichlorobenzene	0.895	0.771	13.9	127	0.00
69	T	benzyl chloride	0.794	0.736	7.3	118	0.00
70	T	1,4-dichlorobenzene	0.850	0.680	20.0	122	0.00
71	T	1,2,3-trimethylbenzene	1.298	1.146	11.7	129	0.00
72	T	1,2-dichlorobenzene	0.920	0.747	18.8	124	0.00
73	T	1,2,4-trichlorobenzene	0.541	0.443	18.1	128	0.00
74	T	Naphthalene	0.859	0.616	28.3	114	0.00
75	T	Hexachloro-1,3-butadiene	0.947	0.867	8.4	142	0.00

Data File : C:\HPCHEM\1\DATA\AK040302.D Vial: 2
Acq On : 3 Apr 2013 9:19 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Tue Apr 09 08:54:35 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane	1.000	1.000	0.0	139	0.00
2	T	Freon 22	2.318	2.272	2.0	146	0.00
3	T	Propylene	0.750	0.606	19.2	124	0.00
4	T	Freon 12	4.997	4.950	0.9	148	0.00
5	T	Chloromethane	1.260	1.246	1.1	151#	0.00
6	T	Freon 114	3.803	3.823	-0.5	152#	0.00
7	T	Vinyl Chloride	1.130	1.058	6.4	149	0.00
8	T	1,3-butadiene	0.796	0.741	6.9	118	0.00
9	T	Bromomethane	1.314	1.404	-6.8	161#	0.00
10	T	Ethanol	0.267	0.290	-8.6	155#	-0.03
11	T	Acrolein	0.268	0.254	5.2	148	-0.03
12	T	Chloroethane	0.507	0.489	3.6	145	0.00
13	T	Vinyl Bromide	1.388	1.379	0.6	149	0.00
14	T	Freon 11	5.257	5.932	-12.8	168#	0.00
15	T	Acetone	0.435	0.531	-22.1	186#	-0.04
16	T	Isopropyl alcohol	1.284	1.241	3.3	148	-0.04
17	T	1,1-dichloroethene	1.151	1.164	-1.1	153#	0.00
18	T	Freon 113	2.759	2.955	-7.1	162#	0.00
19	t	t-Butyl alcohol	2.053	1.849	9.9	138	-0.05
20	T	Methylene chloride	0.968	0.987	-2.0	152#	0.00
21	T	Allyl chloride	1.546	1.487	3.8	154#	0.00
22	T	Carbon disulfide	3.221	3.384	-5.1	165#	0.00
23	T	trans-1,2-dichloroethene	1.584	1.689	-6.6	157#	-0.01
24	T	methyl tert-butyl ether	3.063	2.887	5.7	136	-0.02
25	T	1,1-dichloroethane	2.323	2.105	9.4	135	0.00
26	T	Vinyl acetate	1.790	1.579	11.8	131	-0.04
27	T	Methyl Ethyl Ketone	0.379	0.359	5.3	132	-0.04
28	T	cis-1,2-dichloroethene	1.439	1.266	12.0	127	0.00
29	T	Hexane	1.268	1.127	11.1	136	-0.01
30	T	Ethyl acetate	1.802	1.633	9.4	137	-0.02
31	T	Chloroform	3.318	3.192	3.8	145	0.00
32	T	Tetrahydrofuran	0.780	0.624	20.0	119	-0.05
33	T	1,2-dichloroethane	2.258	2.075	8.1	136	0.00
34	I	1,4-difluorobenzene	1.000	1.000	0.0	112	0.00
35	T	1,1,1-trichloroethane	1.155	1.307	-13.2	140	0.00
36	T	Cyclohexane	0.364	0.364	0.0	119	0.00
37	T	Carbon tetrachloride	1.492	1.633	-9.5	145	0.00
38	T	Benzene	0.910	0.962	-5.7	127	0.00
39	T	Methyl methacrylate	0.277	0.250	9.7	111	-0.02
40	T	1,4-dioxane	0.113	0.131	-15.9	139	-0.05
41	T	2,2,4-trimethylpentane	1.175	1.203	-2.4	123	0.00
42	T	Heptane	0.389	0.391	-0.5	122	0.00
43	T	Trichloroethene	0.541	0.563	-4.1	135	0.00
44	T	1,2-dichloropropane	0.350	0.402	-14.9	139	0.00
45	T	Bromodichloromethane	1.076	1.259	-17.0	141	0.00
46	T	cis-1,3-dichloropropene	0.482	0.484	-0.4	122	0.00
47	T	trans-1,3-dichloropropene	0.455	0.431	5.3	111	0.00
48	T	1,1,2-trichloroethane	0.485	0.553	-14.0	137	0.00
49	I	Chlorobenzene-d5	1.000	1.000	0.0	121	0.00

(#) = Out of Range

Data File : C:\HPCHEM\1\DATA\AK040302.D Vial: 2
Acq On : 3 Apr 2013 9:19 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Tue Apr 09 08:54:35 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
50	T	Toluene	0.648	0.576	11.1	111	0.00
51	T	Methyl Isobutyl Ketone	0.432	0.382	11.6	118	-0.02
52	T	Dibromochloromethane	1.141	1.113	2.5	127	0.00
53	T	Methyl Butyl Ketone	0.289	0.250	13.5	115	-0.02
54	T	1,2-dibromoethane	0.753	0.740	1.7	127	0.00
55	T	Tetrachloroethylene	0.728	0.641	12.0	126	0.00
56	T	Chlorobenzene	1.038	0.990	4.6	123	0.00
57	T	Ethylbenzene	1.395	1.244	10.8	113	0.00
58	T	m&p-xylene	1.120	1.055	5.8	116	0.00
59	T	Styrene	0.683	0.604	11.6	110	0.00
60	T	Bromoform	1.065	0.875	17.8	107	0.00
61	T	o-xylene	1.471	1.369	6.9	132	0.00
62	S	Bromofluorobenzene	0.572	0.533	6.8	109	0.00
63	T	1,1,2,2-tetrachloroethane	0.978	1.025	-4.8	135	0.00
64	T	2-Chlorotoluene	1.138	0.904	20.6	106	0.00
65	T	4-ethyltoluene	1.116	0.908	18.6	99	0.00
66	T	1,3,5-trimethylbenzene	1.516	1.367	9.8	114	0.00
67	T	1,2,4-trimethylbenzene	1.095	0.843	23.0	97	0.00
68	T	1,3-dichlorobenzene	0.895	0.832	7.0	117	0.00
69	T	benzyl chloride	0.794	0.883	-11.2	121	0.00
70	T	1,4-dichlorobenzene	0.850	0.837	1.5	127	0.00
71	T	1,2,3-trimethylbenzene	1.298	1.325	-2.1	127	0.00
72	T	1,2-dichlorobenzene	0.920	0.840	8.7	119	0.00
73	T	1,2,4-trichlorobenzene	0.541	0.476	12.0	117	0.00
74	T	Naphthalene	0.859	0.697	18.9	110	0.00
75	T	Hexachloro-1,3-butadiene	0.947	0.992	-4.8	139	0.00

CENTEK LABORATORIES, LLC

Date: *09-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID AMB1UG-040113	SampType: MBLK	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6801
Client ID: ZZZZZ	Batch ID: R6801	TestNo: TO-15		Analysis Date: 4/1/2013	SeqNo: 80322

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	< 0.15	0.15									
1,1,2-Trichloroethane	< 0.15	0.15									
1,1-Dichloroethane	< 0.15	0.15									
1,1-Dichloroethene	< 0.15	0.15									
1,2,3-Trimethylbenzene	< 0.15	0.15									
1,2,4-Trichlorobenzene	< 0.15	0.15									
1,2,4-Trimethylbenzene	< 0.15	0.15									
1,2-Dichloroethane	< 0.15	0.15									
1,3,5-Trimethylbenzene	< 0.15	0.15									
Benzene	< 0.15	0.15									
Carbon tetrachloride	< 0.15	0.15									
Chloroform	< 0.15	0.15									
cis-1,2-Dichloroethene	< 0.15	0.15									
Ethylbenzene	< 0.15	0.15									
Freon 12	< 0.15	0.15									
Freon 22	< 0.15	0.15									
m&p-Xylene	< 0.30	0.30									
Methyl tert-butyl ether	< 0.15	0.15									
Methylene chloride	< 0.15	0.15									
Naphthalene	< 0.15	0.15									
o-Xylene	< 0.15	0.15									
Tetrachloroethylene	< 0.15	0.15									
Toluene	< 0.15	0.15									
trans-1,2-Dichloroethene	< 0.15	0.15									
Trichloroethene	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID AMB1UG-040113	SampType: MBLK	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6801
Client ID: ZZZZZ	Batch ID: R6801	TestNo: TO-15		Analysis Date: 4/1/2013	SeqNo: 80322

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	< 0.15	0.15									

Sample ID AMB1UG-040213	SampType: MBLK	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6802
Client ID: ZZZZZ	Batch ID: R6802	TestNo: TO-15		Analysis Date: 4/2/2013	SeqNo: 80358

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	< 0.15	0.15									
1,1,2-Trichloroethane	< 0.15	0.15									
1,1-Dichloroethane	< 0.15	0.15									
1,1-Dichloroethene	< 0.15	0.15									
1,2,3-Trimethylbenzene	< 0.15	0.15									
1,2,4-Trichlorobenzene	< 0.15	0.15									
1,2,4-Trimethylbenzene	< 0.15	0.15									
1,2-Dichloroethane	< 0.15	0.15									
1,3,5-Trimethylbenzene	< 0.15	0.15									
Benzene	< 0.15	0.15									
Carbon tetrachloride	< 0.15	0.15									
Chloroform	< 0.15	0.15									
cis-1,2-Dichloroethene	< 0.15	0.15									
Ethylbenzene	< 0.15	0.15									
Freon 12	< 0.15	0.15									
Freon 22	< 0.15	0.15									
m&p-Xylene	< 0.30	0.30									
Methyl tert-butyl ether	< 0.15	0.15									
Methylene chloride	< 0.15	0.15									
Naphthalene	< 0.15	0.15									
o-Xylene	< 0.15	0.15									
Tetrachloroethylene	< 0.15	0.15									
Toluene	< 0.15	0.15									
trans-1,2-Dichloroethene	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID	AMB1UG-040213	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6802
Client ID:	ZZZZZ	Batch ID:	R6802	TestNo:	TO-15			Analysis Date:	4/2/2013	SeqNo:	80358

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	< 0.15	0.15									
Vinyl chloride	< 0.15	0.15									

Sample ID	AMB1UG-040313	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6803
Client ID:	ZZZZZ	Batch ID:	R6803	TestNo:	TO-15			Analysis Date:	4/3/2013	SeqNo:	80370

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	< 0.15	0.15									
1,1,2-Trichloroethane	< 0.15	0.15									
1,1-Dichloroethane	< 0.15	0.15									
1,1-Dichloroethene	< 0.15	0.15									
1,2,3-Trimethylbenzene	< 0.15	0.15									
1,2,4-Trichlorobenzene	< 0.15	0.15									
1,2,4-Trimethylbenzene	< 0.15	0.15									
1,2-Dichloroethane	< 0.15	0.15									
1,3,5-Trimethylbenzene	< 0.15	0.15									
Benzene	< 0.15	0.15									
Carbon tetrachloride	< 0.15	0.15									
Chloroform	< 0.15	0.15									
cis-1,2-Dichloroethene	< 0.15	0.15									
Ethylbenzene	< 0.15	0.15									
Freon 12	< 0.15	0.15									
Freon 22	< 0.15	0.15									
m&p-Xylene	< 0.30	0.30									
Methyl tert-butyl ether	< 0.15	0.15									
Methylene chloride	< 0.15	0.15									
Naphthalene	< 0.15	0.15									
o-Xylene	< 0.15	0.15									
Tetrachloroethylene	< 0.15	0.15									
Toluene	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID	AMB1UG-040313	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6803
Client ID:	ZZZZZ	Batch ID:	R6803	TestNo:	TO-15			Analysis Date:	4/3/2013	SeqNo:	80370

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,2-Dichloroethene	< 0.15	0.15									
Trichloroethene	< 0.15	0.15									
Vinyl chloride	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CENTEK LABORATORIES, LLC

Date: 09-Apr-13

QC SUMMARY REPORT
SURROGATE RECOVERIES

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River
Test No: TO-15 **Matrix:** A

Sample ID	BR4FBZ							
ALCS1UG-040113	88.0							
ALCS1UG-040213	97.0							
ALCS1UG-040313	96.0							
ALCS1UGD-040113	98.0							
ALCS1UGD-040213	96.0							
AMB1UG-040113	80.0							
AMB1UG-040213	85.0							
AMB1UG-040313	77.0							
C1303079-001A	117							
C1303079-002A	111							
C1303079-003A	101							
C1303079-004A	128							
C1303079-005A	93.0							
C1303079-006A	91.0							
C1303079-007A	90.0							
C1303079-008A	89.0							
C1303079-009A	83.0							
C1303079-010A	82.0							

Acronym	Surrogate	QC Limits
BR4FBZ	= Bromofluorobenzene	70-130

*** Surrogate recovery outside acceptance limits**

J

CENTEK LABORATORIES, LLC

Date: *09-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UG-040113	SampType: LCS	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6801
Client ID: ZZZZZ	Batch ID: R6801	TestNo: TO-15		Analysis Date: 4/1/2013	SeqNo: 80323

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.100	0.15	1	0	110	70	130				
1,1,2-Trichloroethane	1.110	0.15	1	0	111	70	130				
1,1-Dichloroethane	0.8600	0.15	1	0	86.0	70	130				
1,1-Dichloroethene	0.9500	0.15	1	0	95.0	70	130				
1,2,4-Trichlorobenzene	0.8400	0.15	1	0	84.0	70	130				
1,2,4-Trimethylbenzene	0.7400	0.15	1	0	74.0	70	130				
1,2-Dichloroethane	0.8700	0.15	1	0	87.0	70	130				
1,3,5-Trimethylbenzene	0.8100	0.15	1	0	81.0	70	130				
Benzene	1.070	0.15	1	0	107	70	130				
Carbon tetrachloride	1.060	0.15	1	0	106	70	130				
Chloroform	0.9400	0.15	1	0	94.0	70	130				
cis-1,2-Dichloroethene	0.8300	0.15	1	0	83.0	70	130				
Ethylbenzene	0.7700	0.15	1	0	77.0	70	130				
Freon 12	0.9600	0.15	1	0	96.0	70	130				
m&p-Xylene	1.680	0.30	2	0	84.0	70	130				
Methyl tert-butyl ether	0.8700	0.15	1	0	87.0	70	130				
Methylene chloride	0.9600	0.15	1	0	96.0	70	130				
o-Xylene	0.8400	0.15	1	0	84.0	70	130				
Tetrachloroethylene	0.8100	0.15	1	0	81.0	70	130				
Toluene	0.8500	0.15	1	0	85.0	70	130				
trans-1,2-Dichloroethene	0.9900	0.15	1	0	99.0	70	130				
Trichloroethene	0.9400	0.15	1	0	94.0	70	130				
Vinyl chloride	0.9100	0.15	1	0	91.0	70	130				

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UG-040213	SampType: LCS	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6802
Client ID: ZZZZZ	Batch ID: R6802	TestNo: TO-15		Analysis Date: 4/2/2013	SeqNo: 80361

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.150	0.15	1	0	115	70	130				
1,1,2-Trichloroethane	1.170	0.15	1	0	117	70	130				
1,1-Dichloroethane	0.9000	0.15	1	0	90.0	70	130				
1,1-Dichloroethene	1.060	0.15	1	0	106	70	130				
1,2,4-Trichlorobenzene	0.8900	0.15	1	0	89.0	70	130				
1,2,4-Trimethylbenzene	0.7500	0.15	1	0	75.0	70	130				
1,2-Dichloroethane	0.9700	0.15	1	0	97.0	70	130				
1,3,5-Trimethylbenzene	0.8700	0.15	1	0	87.0	70	130				
Benzene	1.110	0.15	1	0	111	70	130				
Carbon tetrachloride	1.110	0.15	1	0	111	70	130				
Chloroform	0.9900	0.15	1	0	99.0	70	130				
cis-1,2-Dichloroethene	0.9000	0.15	1	0	90.0	70	130				
Ethylbenzene	0.8900	0.15	1	0	89.0	70	130				
Freon 12	1.020	0.15	1	0	102	70	130				
m&p-Xylene	1.910	0.30	2	0	95.5	70	130				
Methyl tert-butyl ether	0.9300	0.15	1	0	93.0	70	130				
Methylene chloride	1.040	0.15	1	0	104	70	130				
o-Xylene	0.9400	0.15	1	0	94.0	70	130				
Tetrachloroethylene	0.8900	0.15	1	0	89.0	70	130				
Toluene	0.9400	0.15	1	0	94.0	70	130				
trans-1,2-Dichloroethene	1.020	0.15	1	0	102	70	130				
Trichloroethene	1.030	0.15	1	0	103	70	130				
Vinyl chloride	0.9600	0.15	1	0	96.0	70	130				

Sample ID ALCS1UG-040313	SampType: LCS	TestCode: 1ugM3_FullLI	Units: ppbV	Prep Date:	RunNo: 6803
Client ID: ZZZZZ	Batch ID: R6803	TestNo: TO-15		Analysis Date: 4/3/2013	SeqNo: 80371

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.190	0.15	1	0	119	70	130				
1,1,2-Trichloroethane	1.150	0.15	1	0	115	70	130				

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID	ALCS1UG-040313	SampType:	LCS	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6803
Client ID:	ZZZZZ	Batch ID:	R6803	TestNo:	TO-15			Analysis Date:	4/3/2013	SeqNo:	80371

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	0.9900	0.15	1	0	99.0	70	130				
1,1-Dichloroethene	1.080	0.15	1	0	108	70	130				
1,2,4-Trichlorobenzene	0.8800	0.15	1	0	88.0	70	130				
1,2,4-Trimethylbenzene	0.7600	0.15	1	0	76.0	70	130				
1,2-Dichloroethane	0.9900	0.15	1	0	99.0	70	130				
1,3,5-Trimethylbenzene	0.9100	0.15	1	0	91.0	70	130				
Benzene	1.120	0.15	1	0	112	70	130				
Carbon tetrachloride	1.120	0.15	1	0	112	70	130				
Chloroform	1.030	0.15	1	0	103	70	130				
cis-1,2-Dichloroethene	0.9300	0.15	1	0	93.0	70	130				
Ethylbenzene	0.8800	0.15	1	0	88.0	70	130				
Freon 12	1.080	0.15	1	0	108	70	130				
m&p-Xylene	1.860	0.30	2	0	93.0	70	130				
Methyl tert-butyl ether	0.9700	0.15	1	0	97.0	70	130				
Methylene chloride	1.130	0.15	1	0	113	70	130				
o-Xylene	0.9300	0.15	1	0	93.0	70	130				
Tetrachloroethylene	0.9100	0.15	1	0	91.0	70	130				
Toluene	0.9200	0.15	1	0	92.0	70	130				
trans-1,2-Dichloroethene	1.110	0.15	1	0	111	70	130				
Trichloroethene	1.050	0.15	1	0	105	70	130				
Vinyl chloride	1.000	0.15	1	0	100	70	130				

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CENTEK LABORATORIES, LLC

Date: *09-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UGD-040113 SampType: LCSD TestCode: 1ugM3_FullLi Units: ppbV Prep Date: RunNo: 6801
Client ID: ZZZZZ Batch ID: R6801 TestNo: TO-15 Analysis Date: 4/2/2013 SeqNo: 80324

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.170	0.15	1	0	117	70	130	1.1	6.17	30	
1,1,2-Trichloroethane	1.140	0.15	1	0	114	70	130	1.11	2.67	30	
1,1-Dichloroethane	0.8800	0.15	1	0	88.0	70	130	0.86	2.30	30	
1,1-Dichloroethene	1.070	0.15	1	0	107	70	130	0.95	11.9	30	
1,2,4-Trichlorobenzene	0.7900	0.15	1	0	79.0	70	130	0.84	6.13	30	
1,2,4-Trimethylbenzene	0.8400	0.15	1	0	84.0	70	130	0.74	12.7	30	
1,2-Dichloroethane	0.9100	0.15	1	0	91.0	70	130	0.87	4.49	30	
1,3,5-Trimethylbenzene	0.9500	0.15	1	0	95.0	70	130	0.81	15.9	30	
Benzene	1.130	0.15	1	0	113	70	130	1.07	5.45	30	
Carbon tetrachloride	1.080	0.15	1	0	108	70	130	1.06	1.87	30	
Chloroform	0.9700	0.15	1	0	97.0	70	130	0.94	3.14	30	
cis-1,2-Dichloroethene	0.9000	0.15	1	0	90.0	70	130	0.83	8.09	30	
Ethylbenzene	0.9100	0.15	1	0	91.0	70	130	0.77	16.7	30	
Freon 12	1.160	0.15	1	0	116	70	130	0.96	18.9	30	
m&p-Xylene	1.900	0.30	2	0	95.0	70	130	1.68	12.3	30	
Methyl tert-butyl ether	0.9400	0.15	1	0	94.0	70	130	0.87	7.73	30	
Methylene chloride	1.050	0.15	1	0	105	70	130	0.96	8.96	30	
o-Xylene	0.9400	0.15	1	0	94.0	70	130	0.84	11.2	30	
Tetrachloroethylene	0.8900	0.15	1	0	89.0	70	130	0.81	9.41	30	
Toluene	0.9200	0.15	1	0	92.0	70	130	0.85	7.91	30	
trans-1,2-Dichloroethene	1.020	0.15	1	0	102	70	130	0.99	2.99	30	
Trichloroethene	1.040	0.15	1	0	104	70	130	0.94	10.1	30	
Vinyl chloride	1.060	0.15	1	0	106	70	130	0.91	15.2	30	

Qualifiers:

- . Results reported are not blank corrected
- J Analyte detected at or below quantitation limits
- S Spike Recovery outside accepted recovery limits
- E Value above quantitation range
- ND Not Detected at the Reporting Limit
- H Holding times for preparation or analysis exceeded
- R RPD outside accepted recovery limits

CLIENT: Tetra Tech, Inc.
Work Order: C1303079
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UGD-040213	SampType: LCSD	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6802
Client ID: ZZZZZ	Batch ID: R6802	TestNo: TO-15		Analysis Date: 4/3/2013	SeqNo: 80362

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.170	0.15	1	0	117	70	130	1.15	1.72	30	
1,1,2-Trichloroethane	1.170	0.15	1	0	117	70	130	1.17	0	30	
1,1-Dichloroethane	0.9200	0.15	1	0	92.0	70	130	0.9	2.20	30	
1,1-Dichloroethene	1.080	0.15	1	0	108	70	130	1.06	1.87	30	
1,2,4-Trichlorobenzene	0.7900	0.15	1	0	79.0	70	130	0.89	11.9	30	
1,2,4-Trimethylbenzene	0.7700	0.15	1	0	77.0	70	130	0.75	2.63	30	
1,2-Dichloroethane	0.9700	0.15	1	0	97.0	70	130	0.97	0	30	
1,3,5-Trimethylbenzene	0.9100	0.15	1	0	91.0	70	130	0.87	4.49	30	
Benzene	1.120	0.15	1	0	112	70	130	1.11	0.897	30	
Carbon tetrachloride	1.120	0.15	1	0	112	70	130	1.11	0.897	30	
Chloroform	0.9900	0.15	1	0	99.0	70	130	0.99	0	30	
cis-1,2-Dichloroethene	0.9000	0.15	1	0	90.0	70	130	0.9	0	30	
Ethylbenzene	0.9100	0.15	1	0	91.0	70	130	0.89	2.22	30	
Freon 12	1.070	0.15	1	0	107	70	130	1.02	4.78	30	
m&p-Xylene	1.900	0.30	2	0	95.0	70	130	1.91	0.525	30	
Methyl tert-butyl ether	0.9500	0.15	1	0	95.0	70	130	0.93	2.13	30	
Methylene chloride	1.080	0.15	1	0	108	70	130	1.04	3.77	30	
o-Xylene	0.9500	0.15	1	0	95.0	70	130	0.94	1.06	30	
Tetrachloroethylene	0.9300	0.15	1	0	93.0	70	130	0.89	4.40	30	
Toluene	0.9600	0.15	1	0	96.0	70	130	0.94	2.11	30	
trans-1,2-Dichloroethene	1.050	0.15	1	0	105	70	130	1.02	2.90	30	
Trichloroethene	1.070	0.15	1	0	107	70	130	1.03	3.81	30	
Vinyl chloride	1.020	0.15	1	0	102	70	130	0.96	6.06	30	

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

GC/MS QA/QC Check Report

Tune File : C:\HPCHEM\1\DATA\AK040103.D
Tune Time : 1 Apr 2013 11:08 am

Daily Calibration File : C:\HPCHEM\1\DATA\AK040103.D

			(BFB)	(IS1)	(IS2)	(IS3)
				31058	91071	93962
File	Sample	DL	Surrogate Recovery %	Internal Standard Responses		
AK040104.D	ALCS1UG-040113		88	31533	88841	91050
AK040105.D	AMB1UG-040113		80	31969	86649	79570
AK040119.D	C1303079-006A		91	29169	86488	87543
AK040120.D	C1303079-007A		90	29102	84193	86331
AK040121.D	C1303079-008A		89	29524	89568	88686
AK040122.D	C1303079-009A		83	26180	85701	87928
AK040123.D	C1303079-010A		82	27045	79783	78596
AK040124.D	C1303079-001A		117	33776	102889	109854
AK040125.D	C1303079-002A		111	33314	93678	103922
AK040126.D	C1303079-003A		101	32959	98961	102598
AK040127.D	C1303079-004A		128	33643	98775	110046
AK040128.D	C1303079-005A		93	35722	111684	113081
AK040133.D	ALCS1UGD-040113		98	33175	92050	96717
AK040134.D	C1303079-006A	10x	78	27833	76050	73902
AK040135.D	C1303079-007A	10x	82	26403	73220	66887
AK040136.D	C1303079-008A	10x	83	25690	71041	70872
AK040137.D	C1303079-009A	10x	80	25710	73205	69741
AK040138.D	C1303079-010A	10x	77	24159	69416	62238
AK040139.D	C1303079-001A	10x	89	29641	80318	79627
AK040140.D	C1303079-002A	10x	93	29154	81365	83814
AK040141.D	C1303079-003A	10x	90	27643	82136	81061
AK040142.D	C1303079-004A	10x	102	29114	79301	81870

t - fails 24hr time check * - fails criteria

Created: Tue Apr 09 09:05:12 2013 MSD #1/

Tune File : C:\HPCHEM\1\DATA\AK040202.D
Tune Time : 2 Apr 2013 1:47 pm

Daily Calibration File : C:\HPCHEM\1\DATA\AK040202.D

			(BFB)	(IS1)	(IS2)	(IS3)
				26866	74937	76628
File	Sample	DL	Surrogate Recovery %	Internal Standard Responses		
AK040203.D	ALCS1UG-040213		97	29108	83914	84810
AK040204.D	AMB1UG-040213		85	25813	69871	60061
AK040210.D	C1303079-001A	40x	81	29209	79229	73627
AK040211.D	C1303079-002A	40x	83	28646	77024	73383
AK040212.D	C1303079-003A	40x	80	25747	71389	66533
AK040213.D	C1303079-004A	10x	104	27730	79259	81080
AK040214.D	C1303079-004A	40x	85	27345	75056	72977
AK040215.D	C1303079-005A	10x	75	27532	78178	72556
AK040216.D	C1303079-005A	40x	84	28937	78839	71359
AK040223.D	ALCS1UGD-040213		96	26835	77396	77946

t - fails 24hr time check * - fails criteria

Created: Tue Apr 09 09:07:30 2013 MSD #1/

Tune File : C:\HPCHEM\1\DATA\AK040302.D
Tune Time : 3 Apr 2013 9:19 am

Daily Calibration File : C:\HPCHEM\1\DATA\AK040302.D

			(BFB)	(IS1)	(IS2)	(IS3)
				27604	78137	80009
File	Sample	DL	Surrogate Recovery %	Internal Standard Responses		
AK040303.D	ALCS1UG-040313		96	26501	78664	80680
AK040304.D	AMB1UG-040313		77	25077	67660	61743
AK040305.D	C1303079-001A	810X	77	24919	69579	64322
AK040306.D	C1303079-001A	7290X	84	24763	69885	64191
AK040307.D	C1303079-002A	810X	79	25237	70134	65140
AK040308.D	C1303079-003A	810X	74	24276	67674	63365
AK040309.D	C1303079-004A	810X	83	24358	64547	62681
AK040310.D	C1303079-004A	1620X	88	25093	66991	59558
AK040311.D	C1303079-005A	2430X	82	24614	64241	58375
AK040312.D	C1303079-005A	9720X	83	23316	63275	59465
AK040313.D	C1303079-003A	1620X	83	23565	62943	58545

t - fails 24hr time check * - fails criteria

Created: Tue Apr 09 09:09:44 2013 MSD #1/

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT	JOB NUMBER		
Middle River and Tilley Chemical	SDG C1303079		
SUBJECT			
Sample Calculation			
BASED ON	DRAWING NUMBER		
BY	CHECKED BY	APPROVED BY	DATE
Ann Cognetta			April 24, 2013

Sample SV-DUP1-A-14A; (trichloroethene)

$$\frac{62038}{63275} * 9720 * \frac{1\,ppb}{0.541} = 17,615.49\,ppbv$$

$$17,615.49\,ppbv * \frac{131.4\,g/mole}{24,45\,L/mole} = 94669.754\,g/m^3$$

Sample Calculation

Centek Laboratories, LLC

Date: *09-Apr-13*

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	SV-DUP1-A-14A
Lab Order:	C1303079	**Tag Number:**	554,
Project:	Middle River	**Collection Date:**	3/27/2013
Lab ID:	C1303079-005A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1		**TO-15**				**Analyst: RJP**
1,1,1-Trichloroethane	240	33		ug/m3	40	4/2/2013 10:09:00 PM
1,1,2-Trichloroethane	3.2	0.83		ug/m3	1	4/2/2013 1:52:00 AM
1,1-Dichloroethane	1400	1500	J	ug/m3	2430	4/3/2013 2:58:00 PM
1,1-Dichloroethene	67000	6000		ug/m3	9720	4/3/2013 3:32:00 PM
1,2,3-Trimethylbenzene	< 0.75	0.75		ug/m3	1	4/2/2013 1:52:00 AM
1,2,4-Trichlorobenzene	< 1.1	1.1		ug/m3	1	4/2/2013 1:52:00 AM
1,2,4-Trimethylbenzene	0.85	0.75		ug/m3	1	4/2/2013 1:52:00 AM
1,2-Dichloroethane	29	6.2		ug/m3	10	4/2/2013 9:36:00 PM
1,3,5-Trimethylbenzene	< 0.75	0.75		ug/m3	1	4/2/2013 1:52:00 AM
Benzene	10	4.9		ug/m3	10	4/2/2013 9:36:00 PM
Carbon tetrachloride	2.7	0.96		ug/m3	1	4/2/2013 1:52:00 AM
Chloroform	8.3	0.74		ug/m3	1	4/2/2013 1:52:00 AM
cis-1,2-Dichloroethene	5200	1500		ug/m3	2430	4/3/2013 2:58:00 PM
Ethylbenzene	0.79	0.66		ug/m3	1	4/2/2013 1:52:00 AM
Freon 12	2.4	0.75		ug/m3	1	4/2/2013 1:52:00 AM
Freon 22	< 0.54	0.54		ug/m3	1	4/2/2013 1:52:00 AM
m&p-Xylene	3.2	1.3		ug/m3	1	4/2/2013 1:52:00 AM
Methyl tert-butyl ether	< 0.55	0.55		ug/m3	1	4/2/2013 1:52:00 AM
Methylene chloride	< 0.53	0.53		ug/m3	1	4/2/2013 1:52:00 AM
Naphthalene	2.7	0.80		ug/m3	1	4/2/2013 1:52:00 AM
o-Xylene	0.97	0.66		ug/m3	1	4/2/2013 1:52:00 AM
Tetrachloroethylene	64	10		ug/m3	10	4/2/2013 9:36:00 PM
Toluene	82	5.7		ug/m3	10	4/2/2013 9:36:00 PM
trans-1,2-Dichloroethene	56	6.0		ug/m3	10	4/2/2013 9:36:00 PM
Trichloroethene	96000	8200		ug/m3	9720	4/3/2013 3:32:00 PM
Vinyl chloride	310	16		ug/m3	40	4/2/2013 10:09:00 PM

Qualifiers:	**	Reporting Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
	S	Spike Recovery outside accepted recovery limits		

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\AK040312.D Vial: 12
Acq On : 3 Apr 2013 3:32 pm Operator: RJP
Sample : C1303079-005A 9720X SV-DUP1-A-14A Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 04 15:04:51 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	23316	1.00	ppb	0.02
34) 1,4-difluorobenzene	11.78	114	63275	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	59465	1.00	ppb	0.02
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	28114	0.83	ppb	0.02
Spiked Amount 1.000	Range 70 - 130		Recovery = 83.00%			
Target Compounds						Qvalue
17) 1,1-dichloroethene	6.34	96	45998	1.71	ppb	93
43) Trichloroethene	12.38	130	62038	1.81	ppb	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK040312.D A313_1UG.M Tue Apr 09 08:59:25 2013 MSD1 Page 1

Sample Calculation

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
1)	I	Bromochloromethane	----------		ISTD					
2)	T	Freon 22			3.081	2.495	2.258	2.251	2.318	14.51
3)	T	Propylene			0.902	0.799	0.840	0.745	0.750	11.67
4)	T	Freon 12			6.430	5.238	4.955	4.831	4.997	12.39
5)	T	Chloromethane			1.576	1.477	1.232	1.226	1.260	14.29
6)	T	Freon 114			4.946	4.059	3.737	3.681	3.803	13.25
7)	T	Vinyl Chloride	1.539	1.228	1.254	1.180	1.065	1.076	1.130	15.65
8)	T	1,3-butadiene			0.931	0.818	0.703	0.790	0.796	11.00
9)	T	Bromomethane			1.682	1.356	1.335	1.286	1.314	12.22
10)	T	Ethanol				0.297	0.301	0.267	0.267	11.24
11)	T	Acrolein			0.348	0.266	0.253	0.316	0.268	15.80
12)	T	Chloroethane			0.598	0.607	0.515	0.503	0.507	12.58
13)	T	Vinyl Bromide			1.779	1.426	1.436	1.387	1.388	12.57
14)	T	Freon 11			7.033	5.436	5.167	5.090	5.257	14.29
15)	T	Acetone				0.494	0.434	0.464	0.435	8.75
16)	T	Isopropyl alcoh			1.606	1.386	1.334	1.364	1.284	13.47
17)	T	1,1-dichloroeth			1.403	1.317	1.136	1.106	1.151	11.64
18)	T	Freon 113			3.698	2.902	2.731	2.739	2.759	14.84
19)	t	t-Butyl alcohol			2.837	2.073	2.026	1.999	2.053	16.43
20)	T	Methylene chlor			1.210	1.099	0.999	0.939	0.968	13.24
21)	T	Allyl chloride			1.877	1.966	1.500	1.482	1.546	15.52
22)	T	Carbon disulfid			4.597	3.489	3.093	3.120	3.221	18.55
23)	T	trans-1,2-dichl			2.028	1.600	1.480	1.589	1.584	11.75
24)	T	methyl tert-but			3.872	3.220	2.988	2.808	3.063	11.56
25)	T	1,1-dichloroeth			3.052	2.440	2.194	2.322	2.323	13.53
26)	T	Vinyl acetate			2.495	1.506	1.629	1.914	1.790	17.55
27)	T	Methyl Ethyl Ke				0.366	0.396	0.398	0.379	4.47
28)	T	cis-1,2-dichlor			1.896	1.355	1.459	1.335	1.439	13.09
29)	T	Hexane			1.592	1.227	1.174	1.282	1.268	10.97
30)	T	Ethyl acetate			2.170	1.847	1.715	1.754	1.802	8.91
31)	T	Chloroform			4.440	3.414	3.311	3.200	3.318	14.33
32)	T	Tetrahydrofuran			0.952	0.885	0.776	0.747	0.780	11.53
33)	T	1,2-dichloroeth			2.949	2.320	2.209	2.204	2.258	12.92
34)	I	1,4-difluorobenzene	----------		ISTD					
35)	T	1,1,1-trichloro			1.691	1.197	1.110	1.124	1.155	19.49
36)	T	Cyclohexane			0.454	0.362	0.344	0.347	0.364	10.62
37)	T	Carbon tetrachl	2.306	1.702	1.954	1.379	1.339	1.321	1.492	25.15
38)	T	Benzene			1.169	0.940	0.930	0.890	0.910	12.50
39)	T	Methyl methacry			0.372	0.258	0.260	0.273	0.277	14.13
40)	T	1,4-dioxane				0.129	0.111	0.112	0.113	6.79
41)	T	2,2,4-trimethyl			1.581	1.160	1.122	1.111	1.175	14.30
42)	T	Heptane			0.557	0.386	0.375	0.349	0.389	17.92
43)	T	Trichloroethene	0.771	0.585	0.694	0.512	0.490	0.476	0.541	20.17
44)	T	1,2-dichloropro			0.469	0.354	0.351	0.341	0.350	14.45
45)	T	Bromodichlorome			1.483	1.087	1.074	1.029	1.076	15.84
46)	T	cis-1,3-dichlor			0.661	0.457	0.457	0.467	0.482	15.14
47)	T	trans-1,3-dichl			0.564	0.407	0.452	0.422	0.455	10.95
48)	T	1,1,2-trichloro			0.657	0.492	0.488	0.454	0.485	14.88
49)	I	Chlorobenzene-d5	----------		ISTD					
50)	T	Toluene			0.844	0.608	0.629	0.623	0.648	12.47
51)	T	Methyl Isobutyl				0.475	0.458	0.455	0.432	8.76

(#) = Out of Range ### Number of calibration levels exceeded format ###

GC/MS VOLATILES-WHOLE AIR

METHOD TO-15

CANISTER CLEANING LOG

Instrument: Entech 3100

Canister Number	QC Can Number	Number of Cycles	Date	QC Batch Number	Detection Limits	Leak Test 24hr (psig str/stp)	
464	466	30	3.19.13	WAC031913K	ug/m3 +0.25	+ 30	+ 30
351						+	+
1192						+	+
318						+	+
466						+	+
495	229			WAC031913L		+	+
240						+	+
431						+	+
320						+	+
229						+	+
493	552			WAC031913M		+	+
318						+	+
1175						+	+
354						+	+
552						+	+
1173	364			WAC031913N		+	+
245						+	+
554						+	+
544						+	+
364						+	+
133	283			WAC031913O		+	+
360						+	+
131						+	+
138						+	+
283						+	+

Cleaned by: _____

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Centek Laboratories, LLC

Instrument: Entech 3100

QC Canister Cleaning Logbook

Canister Number	QC Can Number	Number of Cycles	Date	QC Batch Number	Detection Limits	Leak Test 24hr (psig str/stp)	
1183	556	30	3-19-13	WAC031913P	1ug/m3+0.25	+30	+30
558						+	+
429						+	+
367						+	+
556						+	+
1174	357			WAC031913Q		+	+
98						+	+
571						+	+
542						+	+
359						+	+
211	1197			WAC031913R		+	+
1205						+	+
218						+	+
4184						+	+
1197						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+

Cleaned by: _____

Page # 146

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031917.D Vial: 11
Acq On : 19 Mar 2013 6:56 pm Operator: RJP
Sample : WAC031913K Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:07 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11759	1.00	ppb	0.02
34) 1,4-difluorobenzene	11.77	114	36585	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31646	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	14287	0.79	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 79.00%			
Target Compounds						Qvalue

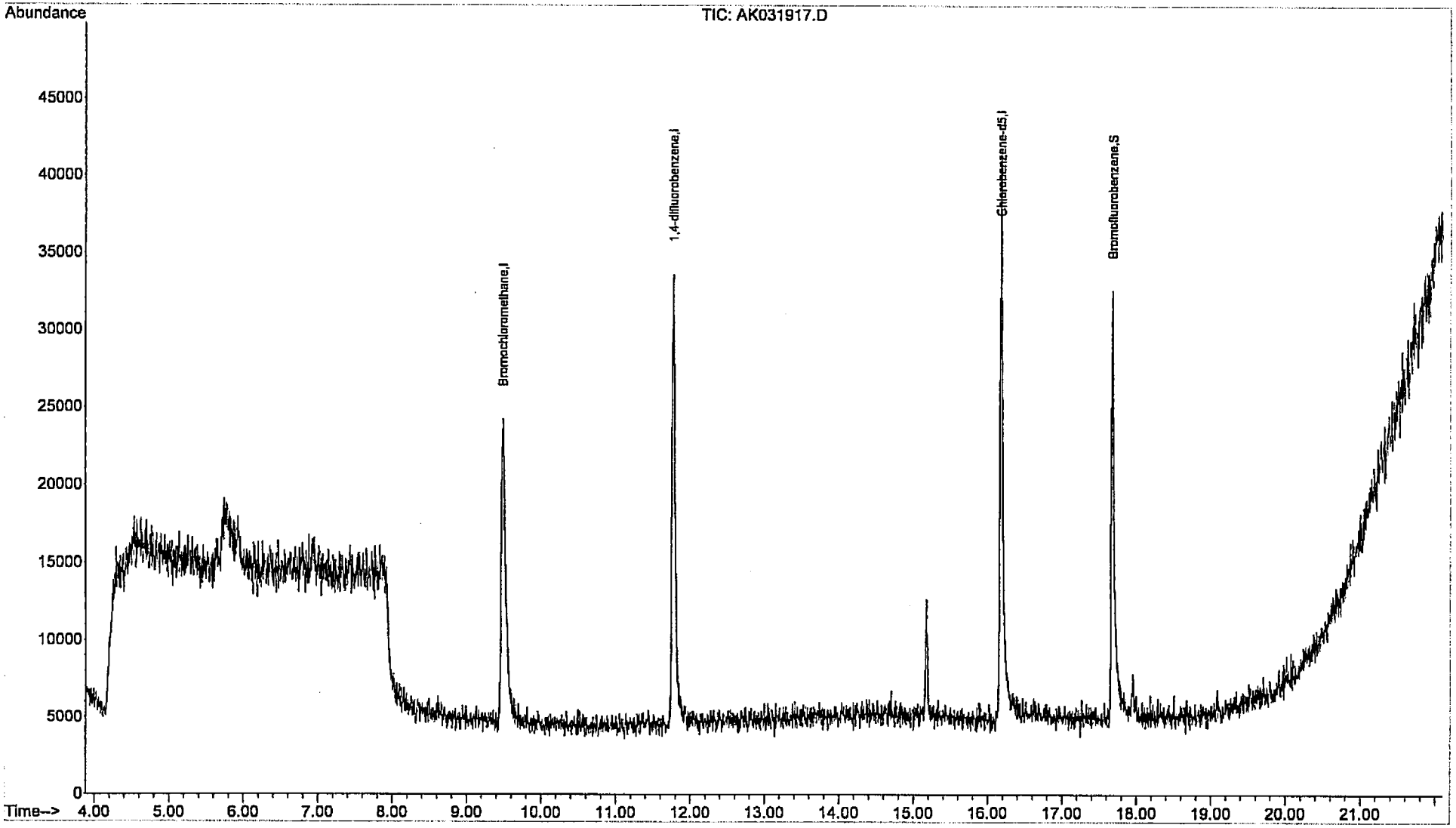
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031917.D
Acq On : 19 Mar 2013 6:56 pm
Sample : WAC031913K
Misc :
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013

Vial: 11
Operator: RJP
Inst : MSD #1
Multiplr: 1.00
Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



AK031917.D A313_1UG.M Tue Apr 16 11:10:23 2013 MSD1 Page 2

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031918.D Vial: 12
Acq On : 19 Mar 2013 7:29 pm Operator: RJP
Sample : WAC031913L Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:08 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11111	1.00	ppb	0.02
34) 1,4-difluorobenzene	11.78	114	34796	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31964	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	13168	0.72	ppb	0.01
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

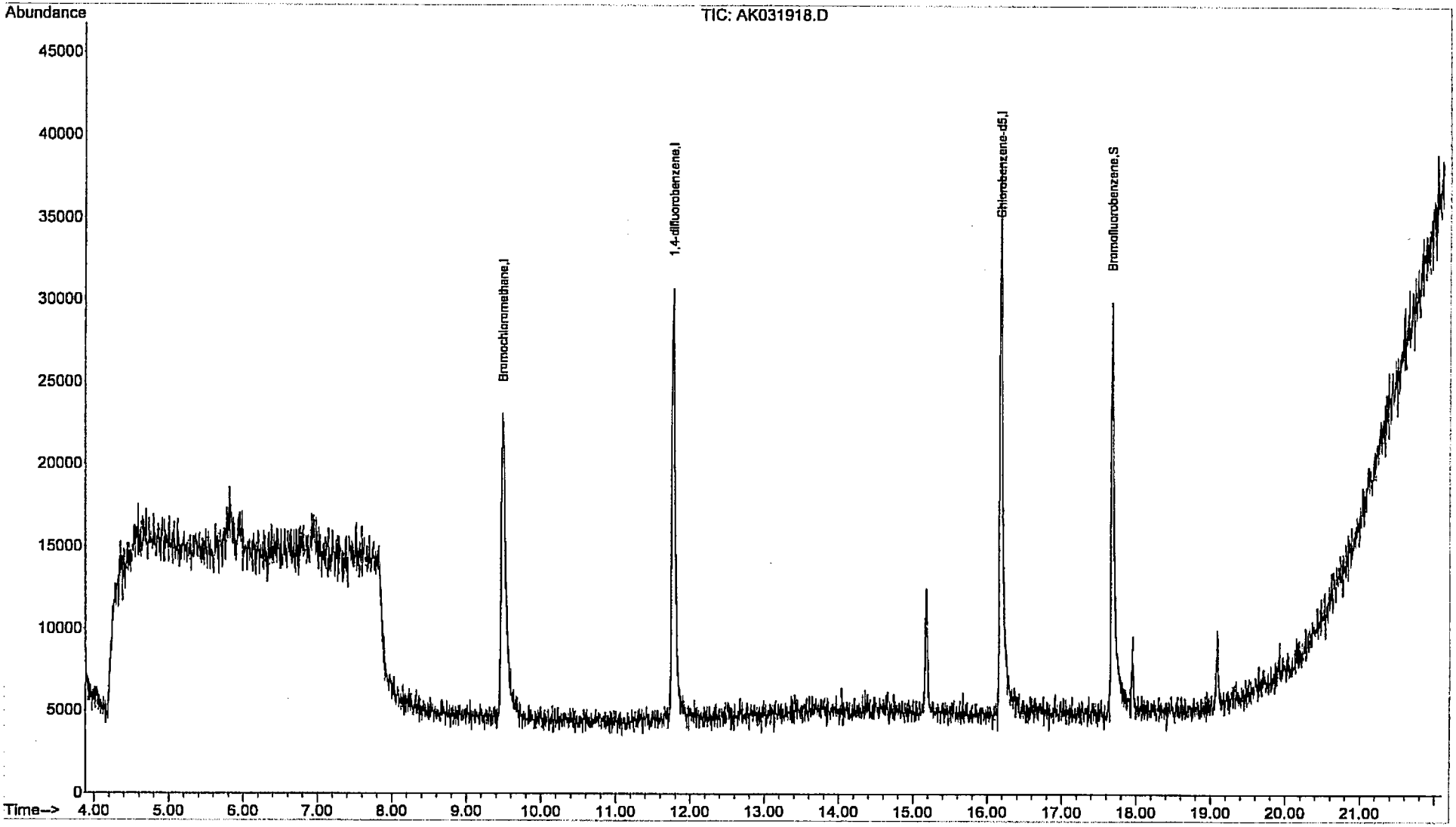
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031918.D
Acq On : 19 Mar 2013 7:29 pm
Sample : WAC031913L
Misc :
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013

Vial: 12
Operator: RJP
Inst : MSD #1
Multiplr: 1.00
Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031919.D Vial: 13
Acq On : 19 Mar 2013 8:03 pm Operator: RJP
Sample : WAC031913M Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:09 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_TO15

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11266	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	33083	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	29053	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	11984	0.72	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

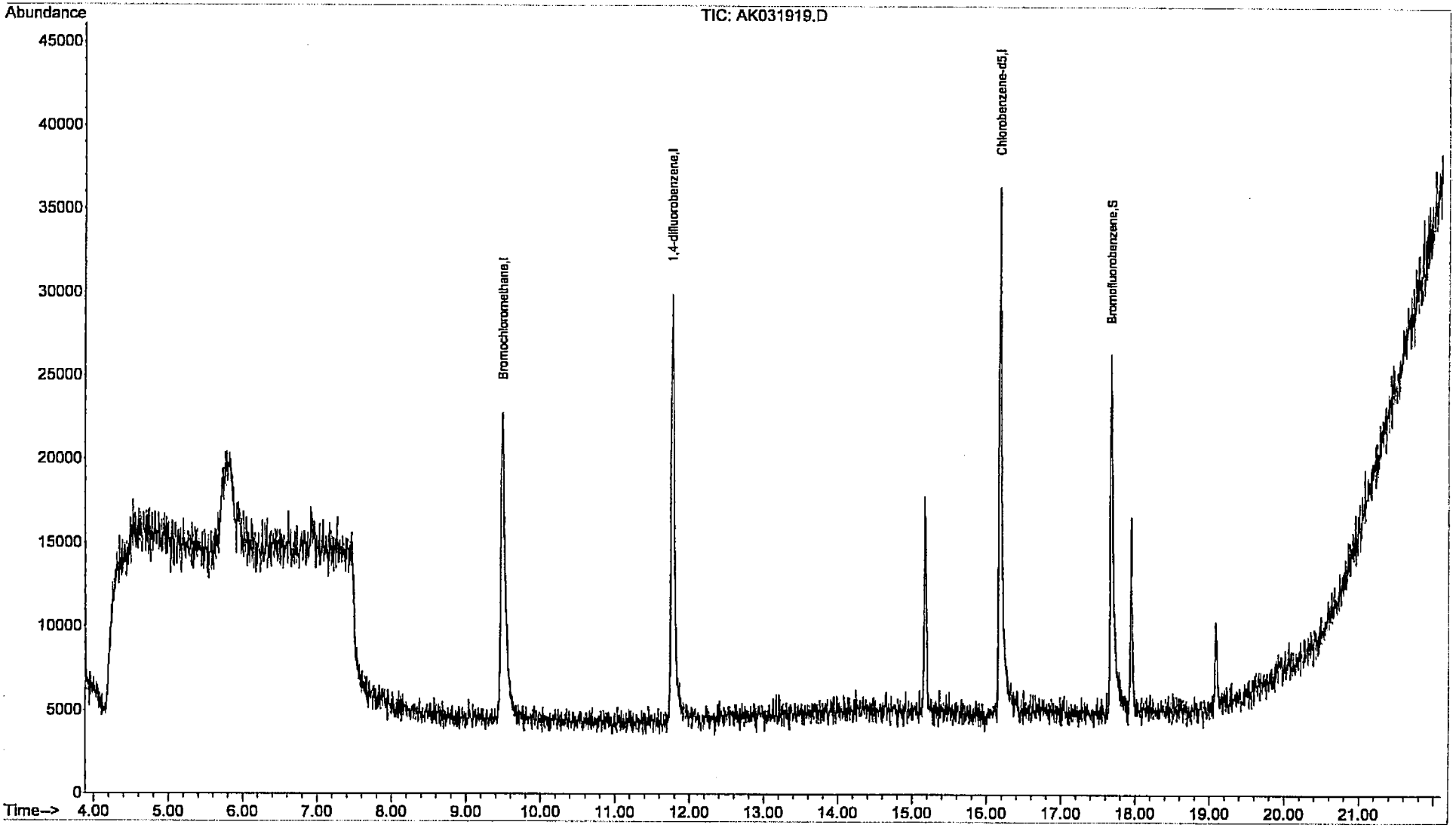
(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031919.D A313_1UG.M Tue Apr 16 11:10:26 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031919.D
Acq On : 19 Mar 2013 8:03 pm
Sample : WAC031913M
Misc :
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013

Vial: 13
Operator: RJP
Inst : MSD #1
Multiplr: 1.00
Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031920.D Vial: 14
Acq On : 19 Mar 2013 8:36 pm Operator: RJP
Sample : WAC031913N Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:10 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11684	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	35873	1.00	ppb	0.01
49) Chlorobenzene-d5	16.18	117	32390	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	14021	0.76	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 76.00%			
Target Compounds						Qvalue

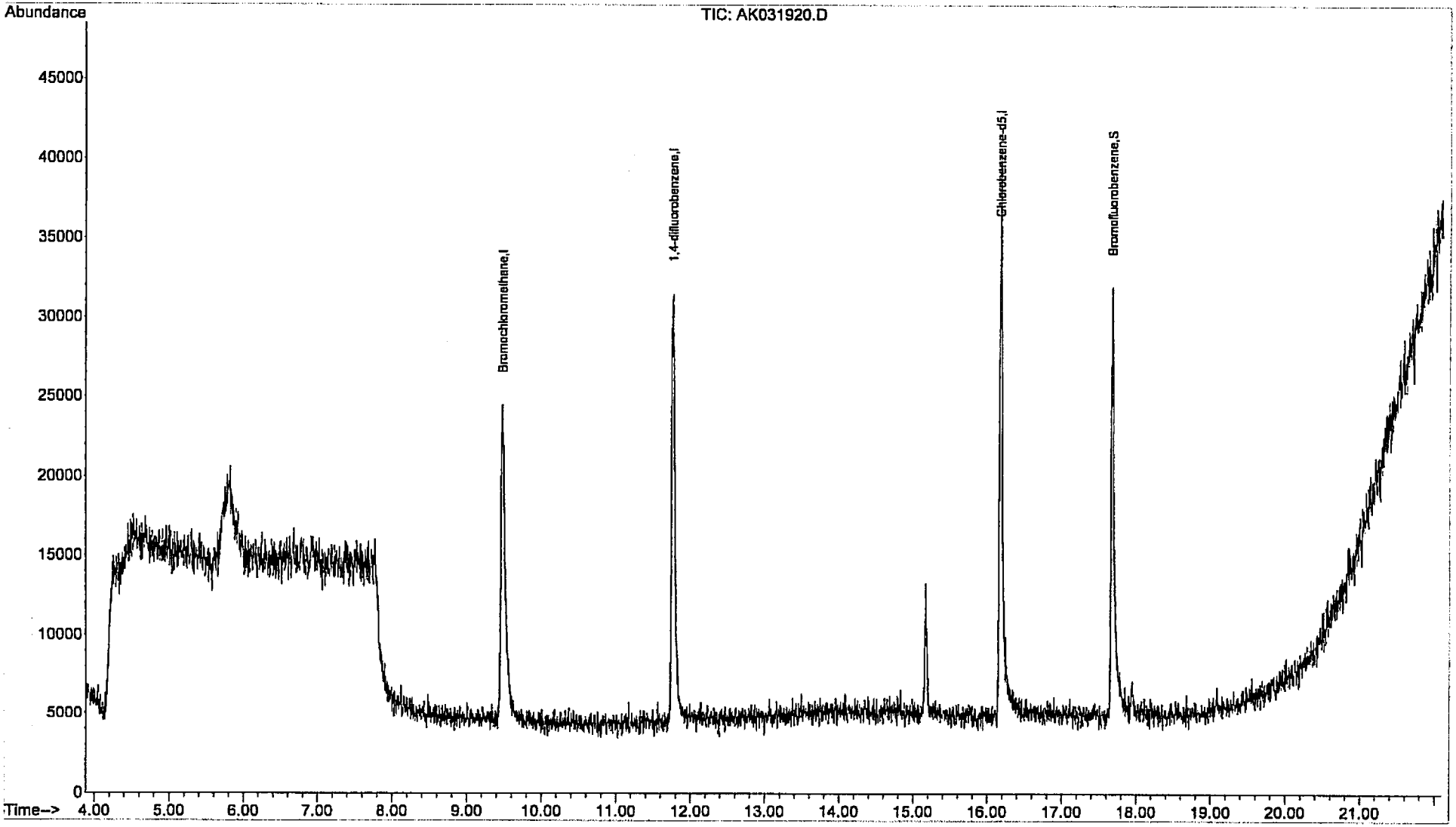
(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031920.D A313_1UG.M Tue Apr 16 11:10:28 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031920.D
Acq On : 19 Mar 2013 8:36 pm
Sample : WAC031913N
Misc :
MS Integration Params: RTEINT.P
Quant Time: Mar 20 6:45 2013

Vial: 14
Operator: RJP
Inst : MSD #1
Multiplr: 1.00
Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031921.D Vial: 15
Acq On : 19 Mar 2013 9:09 pm Operator: RJP
Sample : WAC0319130 Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:11 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

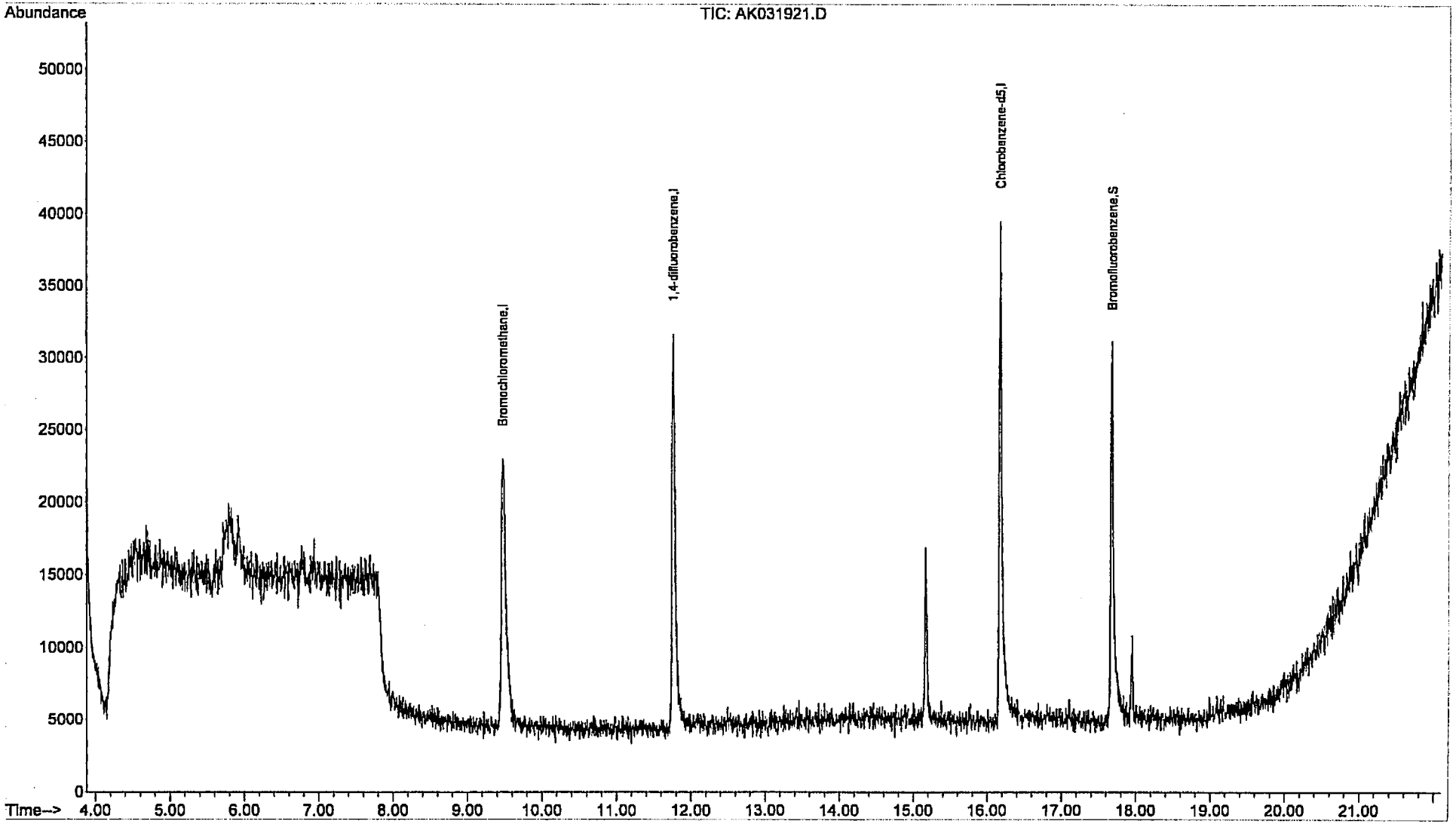
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11588	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	33952	1.00	ppb	0.02
49) Chlorobenzene-d5	16.17	117	30767	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	13040	0.74	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 74.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031921.D Vial: 15
Acq On : 19 Mar 2013 9:09 pm Operator: RJP
Sample : WAC0319130 Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031922.D Vial: 16
Acq On : 19 Mar 2013 9:42 pm Operator: RJP
Sample : WAC031913P Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:12 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

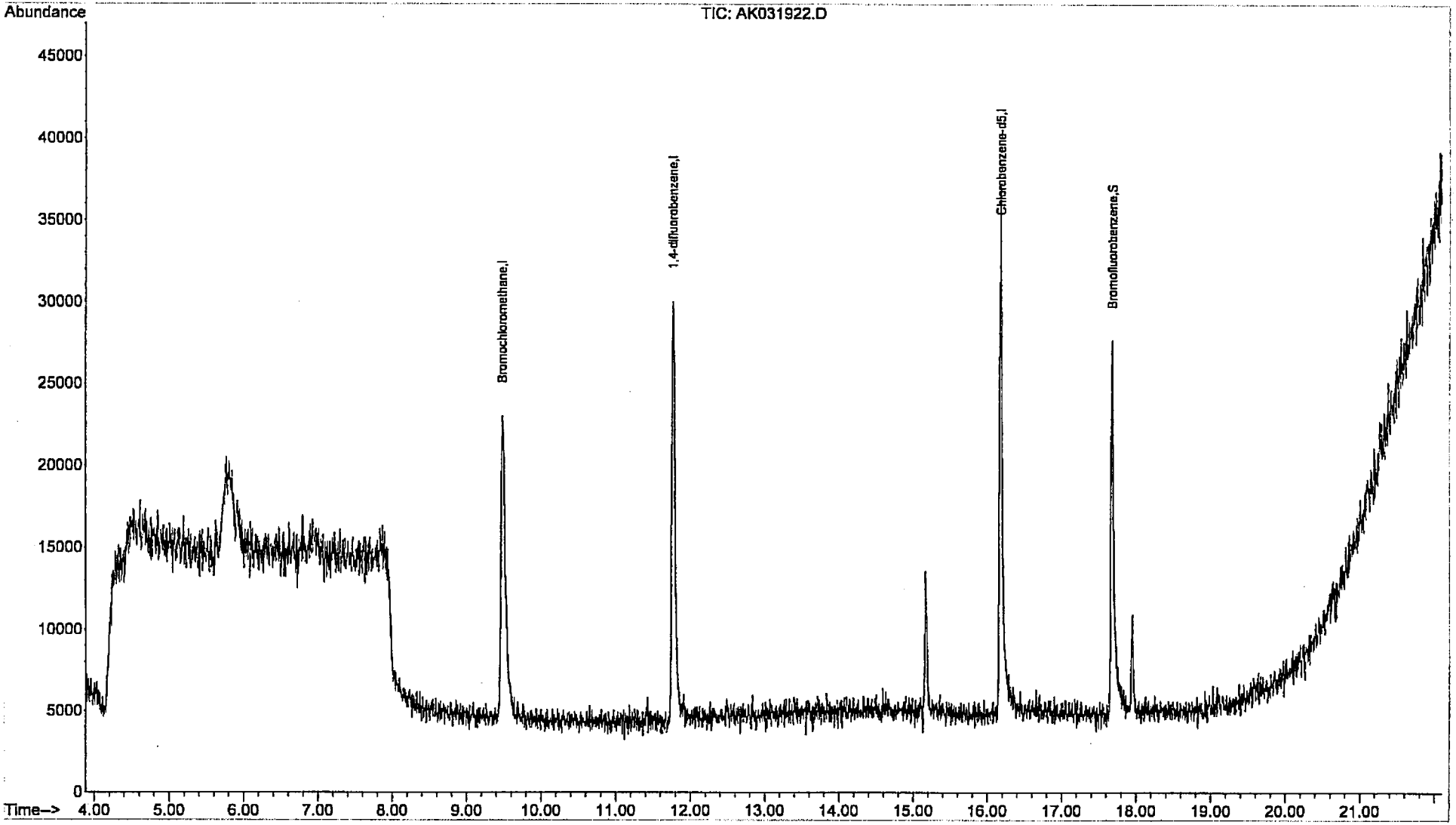
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11290	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	33532	1.00	ppb	0.01
49) Chlorobenzene-d5	16.18	117	29066	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	12001	0.72	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031922.D Vial: 16
Acq On : 19 Mar 2013 9:42 pm Operator: RJP
Sample : WAC031913P Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031923.D Vial: 17
Acq On : 19 Mar 2013 10:15 pm Operator: RJP
Sample : WAC031913Q Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:13 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11192	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	34366	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	30569	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	12478	0.71	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 71.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031923.D A313_1UG.M Tue Apr 16 11:10:34 2013 MSD1 Page 1

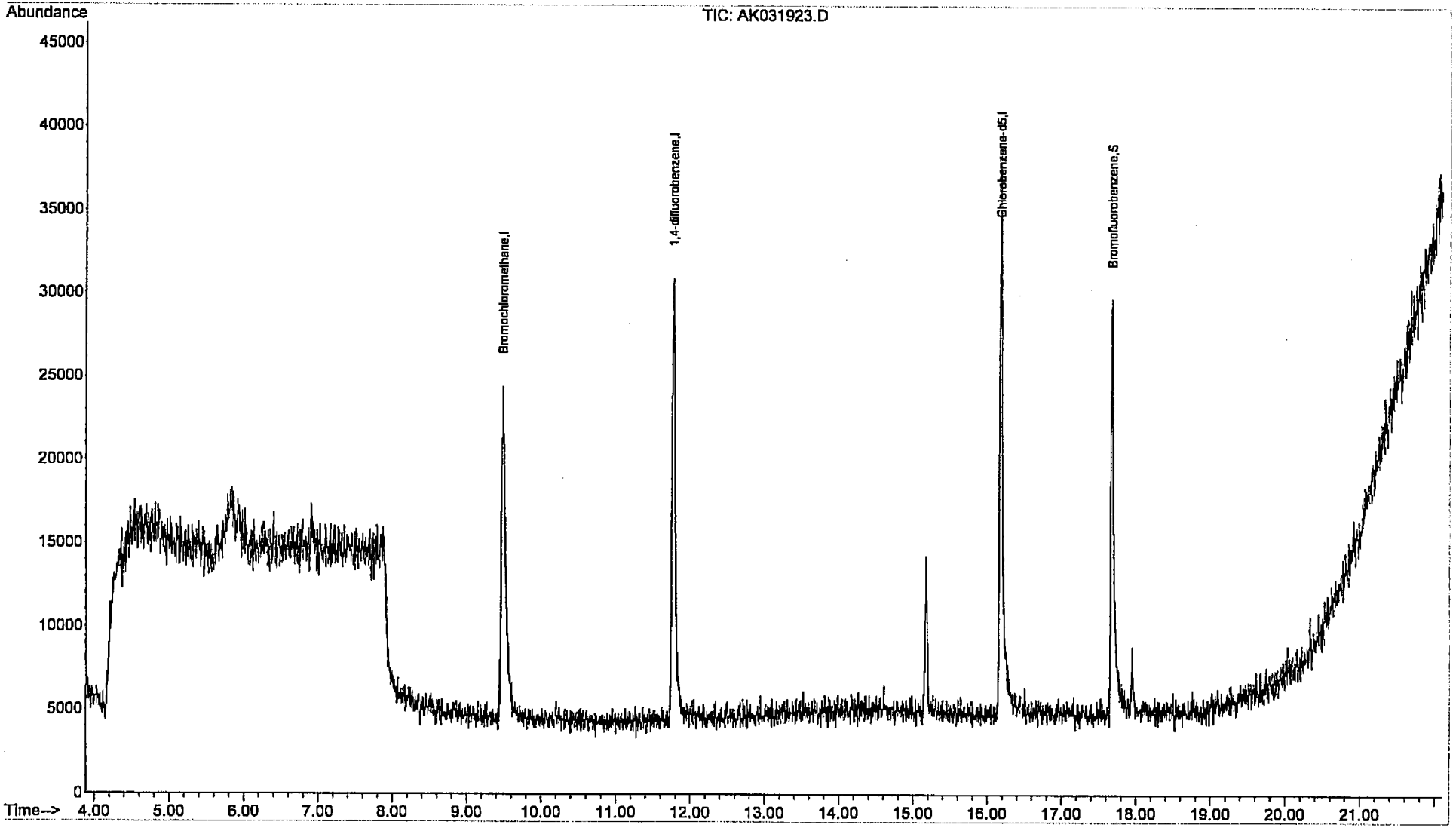
Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031923.D
Acq On : 19 Mar 2013 10:15 pm
Sample : WAC031913Q
Misc :
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013

Vial: 17
Operator: RJP
Inst : MSD #1
Multiplr: 1.00

Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



AK031923.D A313_1UG.M Tue Apr 16 11:10:35 2013 MSD1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031924.D Vial: 18
Acq On : 19 Mar 2013 10:48 pm Operator: RJP
Sample : WAC031913R Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:14 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11104	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	34151	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31381	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	13124	0.73	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 73.00%			
Target Compounds						Qvalue

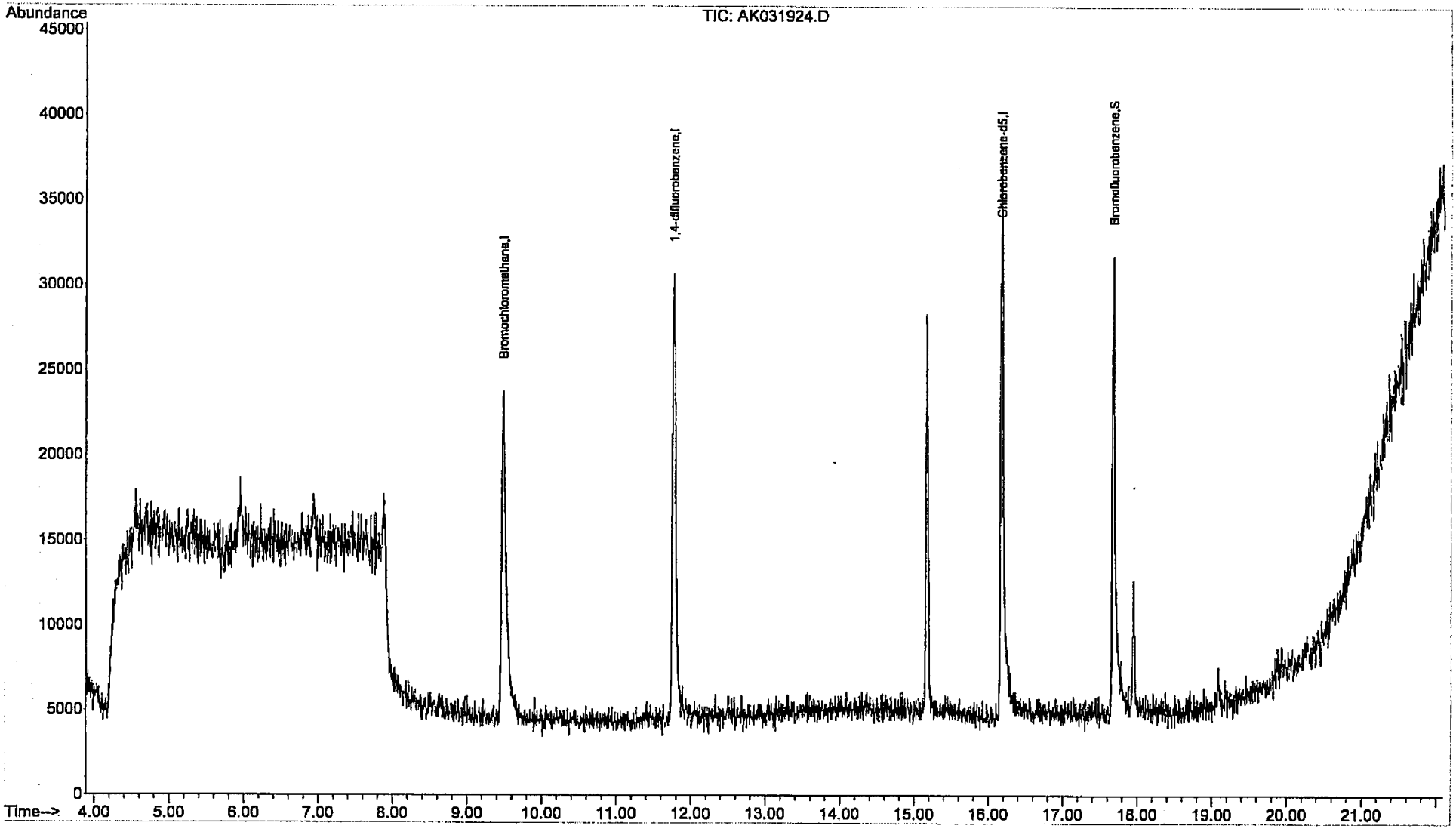
(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031924.D A313_1UG.M Tue Apr 16 11:10:36 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031924.D
Acq On : 19 Mar 2013 10:48 pm
Sample : WAC031913R
Misc :
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013

Vial: 18
Operator: RJP
Inst : MSD #1
Multiplr: 1.00
Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration



Tetra Tech, INC INTERNAL CORRESPONDENCE

TO: **E. SAMUELS** **DATE:** **MAY 8, 2013**

FROM: **A. COGNETTI** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
LOCKHEED MIDDLE RIVER
SAMPLE DELIVERY GROUP (SDG) - C1304005

SAMPLES: 5/Air/VOC

IA-015-A-14A IA-076-A-14A IA-079-A-14A IA-108-A-14A
IA-118-A-14A

Overview

The sample set for Lockheed Middle River SDG C1304005 consisted of five (5) indoor air samples. The air samples were analyzed for a select list of volatile organic compounds (VOC). There are no field duplicates included in this SDG.

The samples were collected by Tetra Tech on March 28, 2013 and sent to Centek Laboratories, LLC. The laboratory analyzed the samples in accordance with EPA Method TO-15 analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters: data completeness, holding times, GC/MS tuning, initial/continuing calibrations, laboratory method blank/canister blank results, blank spike/blank spike duplicate results, surrogate spike recoveries, internal standard recoveries, chromatographic resolution, compound identification, compound quantitation, field duplicate precision and detection limits. Areas of concern are listed below.

Major Issues

No major issues were identified.

Minor Issues

- Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

Additional Comments

Samples were analyzed at the following dilutions:

Sample	Dilution
IA-015-A-14A	10X (m&p xylenes, methylene chloride, toluene)
IA-076-A-14A	10X (1,1-dichloroethene, toluene, trichloroethene)
IA-079-A-14A	10X (toluene)
IA-108-A-14A	10X (m&p xylenes, toluene)
IA-118-A-14A	10X (toluene)

The laboratory reported the VOC air result concentrations in units of µg/m3 and also ppbv on the sample forms. The results in the database and the qualified analytical result concentrations are reported as µg/m3 only.

Non-detected sample analytes results were reported to the method detection limit (MDL).

The data package initially reported the sample non-detected analytes only to the Reporting Limit (RL). The laboratory was contacted and reported the non-detected sample analytes to the MDL.

Form 1s identified sample identifications beginning with 1A but the correct identifications begin with IA. The data reviewer corrected the database and the form 1s.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the USEPA Method TO-15 and the Region III Modifications to the National Functional Guidelines for Organic Data Review (September 1994).

Ann Cognetti
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A - Qualified Analytical Results
Appendix B - Results as Reported by the Laboratory
Appendix C - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate

PROJ_NO: 04792	NSAMPLE	IA-015-A-14A			IA-076-A-14A			IA-079-A-14A			IA-108-A-14A		
SDG: C1304005	LAB_ID	C1304005-001A			C1304005-004A			C1304005-003A			C1304005-005A		
FRACTION: OV-M3	SAMP_DATE	3/28/2013			3/28/2013			3/28/2013			3/28/2013		
MEDIA: AIR	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/M3			UG/M3			UG/M3			UG/M3		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.27	U		0.27	U		0.27	U		0.27	U	
1,1,2-TRICHLOROETHANE		0.2	U		0.2	U		0.2	U		0.2	U	
1,1-DICHLOROETHANE		0.22	U		0.82			1.4			0.22	U	
1,1-DICHLOROETHENE		0.22	U		8.1			4.5			0.22	U	
1,2,3-TRIMETHYLBENZENE		0.18	U		0.18	U		0.18	U		0.8		
1,2,4-TRICHLOROBENZENE		0.45	U		0.45	U		0.45	U		0.45	U	
1,2,4-TRIMETHYLBENZENE		0.85			0.5	J	P	0.6	J	P	2.6		
1,2-DICHLOROETHANE		0.2	U		0.2	U		0.2	U		0.2	U	
1,3,5-TRIMETHYLBENZENE		0.18	U		0.18	U		0.18	U		0.65	J	P
BENZENE		1.1			0.62			0.75			2.5		
CARBON TETRACHLORIDE		0.36	U		0.36	U		0.36	U		0.36	U	
CHLORODIFLUOROMETHANE		1.2			2.7			2.2			1.5		
CHLOROFORM		0.2	U		0.5	J	P	0.2	U		0.2	U	
CIS-1,2-DICHLOROETHENE		0.48	J	P	1.8			0.85			0.64		
DICHLORODIFLUOROMETHANE		2.4			2.5			2.5			2.5		
ETHYLBENZENE		4.4			2.4			1.3			4.6		
M+P-XYLENES		17			14			9.4			19		
METHYL TERT-BUTYL ETHER		0.24	U		0.24	U		0.24	U		0.24	U	
METHYLENE CHLORIDE		24			1.3			0.99			2.2		
NAPHTHALENE		0.25	U		1.2			0.25	U		0.64	J	P
O-XYLENE		8.7			4.8			2.4			9		
TETRACHLOROETHENE		0.39	U		0.39	U		0.39	U		0.39	U	
TOLUENE		99			70			38			100		
TRANS-1,2-DICHLOROETHENE		0.19	U		0.19	U		0.19	U		0.19	U	
TRICHLOROETHENE		1.8			7.6	J	P	8.2			5.6		
VINYL CHLORIDE		0.21	U		0.21	U		0.21	U		0.21	U	

PROJ_NO: 04792	NSAMPLE	IA-118-A-14A
SDG: C1304005	LAB_ID	C1304005-002A
FRACTION: OV-M3	SAMP_DATE	3/28/2013
MEDIA: AIR	QC_TYPE	NM
	UNITS	UG/M3
	PCT_SOLIDS	
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	1		
1,1,2-TRICHLOROETHANE	0.2	U	
1,1-DICHLOROETHANE	2.8		
1,1-DICHLOROETHENE	4.2		
1,2,3-TRIMETHYLBENZENE	0.18	U	
1,2,4-TRICHLOROBENZENE	0.45	U	
1,2,4-TRIMETHYLBENZENE	0.6	J	P
1,2-DICHLOROETHANE	0.2	U	
1,3,5-TRIMETHYLBENZENE	0.18	U	
BENZENE	0.65		
CARBON TETRACHLORIDE	0.36	U	
CHLORODIFLUOROMETHANE	7.2		
CHLOROFORM	0.2	U	
CIS-1,2-DICHLOROETHENE	0.19	U	
DICHLORODIFLUOROMETHANE	2.4		
ETHYLBENZENE	1.5		
M+P-XYLENES	8.7		
METHYL TERT-BUTYL ETHER	0.24	U	
METHYLENE CHLORIDE	1.4		
NAPHTHALENE	0.25	U	
O-XYLENE	2.1		
TETRACHLOROETHENE	0.39	U	
TOLUENE	40		
TRANS-1,2-DICHLOROETHENE	0.19	U	
TRICHLOROETHENE	2.9		
VINYL CHLORIDE	0.21	U	

Appendix B

Results as Reported by the Laboratory

Centek Laboratories, LLC

Date: *25-Apr-13*

ZA

CLIENT: Tetra Tech, Inc.
Client Sample ID: ~~TA-05~~-A-14A AC 4-26-13
Lab Order: C1304005
Tag Number: 556,299
Project: Middle River
Collection Date: 3/28/2013
Lab ID: C1304005-001A
Matrix: AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 5:47:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 5:47:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 5:47:00 PM
1,1-Dichloroethene	< 0.60		0.22	0.60	ug/m3	1	4/1/2013 5:47:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 5:47:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 5:47:00 PM
1,2,4-Trimethylbenzene	0.85		0.23	0.75	ug/m3	1	4/1/2013 5:47:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 5:47:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 5:47:00 PM
Benzene	1.1		0.13	0.49	ug/m3	1	4/1/2013 5:47:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 5:47:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 5:47:00 PM
cis-1,2-Dichloroethene	0.48	J	0.19	0.60	ug/m3	1	4/1/2013 5:47:00 PM
Ethylbenzene	4.4		0.19	0.66	ug/m3	1	4/1/2013 5:47:00 PM
Freon 12	2.4		0.20	0.75	ug/m3	1	4/1/2013 5:47:00 PM
Freon 22	1.2		0.18	0.54	ug/m3	1	4/1/2013 5:47:00 PM
m&p-Xylene	17		4.4	13	ug/m3	10	4/2/2013 4:03:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 5:47:00 PM
Methylene chloride	24		1.4	5.3	ug/m3	10	4/2/2013 4:03:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 5:47:00 PM
o-Xylene	8.7		0.19	0.66	ug/m3	1	4/1/2013 5:47:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 5:47:00 PM
Toluene	99		1.5	5.7	ug/m3	10	4/2/2013 4:03:00 PM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 5:47:00 PM
Trichloroethene	1.8		0.36	0.82	ug/m3	1	4/1/2013 5:47:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 5:47:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

IA 5-8-13 JAS

CLIENT: Tetra Tech, Inc.
Lab Order: C1304005
Project: Middle River
Lab ID: C1304005-004A

Client Sample ID: ~~IA~~-076-A-14A
Tag Number: 138,1157
Collection Date: 3/28/2013
Matrix: AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 7:28:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 7:28:00 PM
1,1-Dichloroethane	0.82		0.22	0.62	ug/m3	1	4/1/2013 7:28:00 PM
1,1-Dichloroethene	8.1		2.2	6.0	ug/m3	10	4/2/2013 5:42:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 7:28:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 7:28:00 PM
1,2,4-Trimethylbenzene	0.50	J	0.23	0.75	ug/m3	1	4/1/2013 7:28:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 7:28:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 7:28:00 PM
Benzene	0.62		0.13	0.49	ug/m3	1	4/1/2013 7:28:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 7:28:00 PM
Chloroform	0.50	J	0.20	0.74	ug/m3	1	4/1/2013 7:28:00 PM
cis-1,2-Dichloroethene	1.8		0.19	0.60	ug/m3	1	4/1/2013 7:28:00 PM
Ethylbenzene	2.4		0.19	0.66	ug/m3	1	4/1/2013 7:28:00 PM
Freon 12	2.5		0.20	0.75	ug/m3	1	4/1/2013 7:28:00 PM
Freon 22	2.7		0.18	0.54	ug/m3	1	4/1/2013 7:28:00 PM
m&p-Xylene	14		0.44	1.3	ug/m3	1	4/1/2013 7:28:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 7:28:00 PM
Methylene chloride	1.3		0.14	0.53	ug/m3	1	4/1/2013 7:28:00 PM
Naphthalene	1.2		0.25	0.80	ug/m3	1	4/1/2013 7:28:00 PM
o-Xylene	4.8		0.19	0.66	ug/m3	1	4/1/2013 7:28:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 7:28:00 PM
Toluene	70		1.5	5.7	ug/m3	10	4/2/2013 5:42:00 PM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 7:28:00 PM
Trichloroethene	7.6	J	3.6	8.2	ug/m3	10	4/2/2013 5:42:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 7:28:00 PM

Qualifiers:

**	Reporting Limit
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
JN	Non-routine analyte. Quantitation estimated.
S	Spike Recovery outside accepted recovery limits
.	Results reported are not blank corrected
E	Value above quantitation range
J	Analyte detected at or below quantitation limits
ND	Not Detected at the Reporting Limit

Centek Laboratories, LLC

Date: *25-Apr-13*

IA 5-8-13 JAJ

CLIENT: Tetra Tech, Inc.
Lab Order: C1304005
Project: Middle River
Lab ID: C1304005-003A

Client Sample ID: ~~IA~~-079-A-14A
Tag Number: 558,172
Collection Date: 3/28/2013
Matrix: AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 6:55:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 6:55:00 PM
1,1-Dichloroethane	1.4		0.22	0.62	ug/m3	1	4/1/2013 6:55:00 PM
1,1-Dichloroethene	4.5		0.22	0.60	ug/m3	1	4/1/2013 6:55:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 6:55:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 6:55:00 PM
1,2,4-Trimethylbenzene	0.60	J	0.23	0.75	ug/m3	1	4/1/2013 6:55:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 6:55:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 6:55:00 PM
Benzene	0.75		0.13	0.49	ug/m3	1	4/1/2013 6:55:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 6:55:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 6:55:00 PM
cis-1,2-Dichloroethene	0.85		0.19	0.60	ug/m3	1	4/1/2013 6:55:00 PM
Ethylbenzene	1.3		0.19	0.66	ug/m3	1	4/1/2013 6:55:00 PM
Freon 12	2.5		0.20	0.75	ug/m3	1	4/1/2013 6:55:00 PM
Freon 22	2.2		0.18	0.54	ug/m3	1	4/1/2013 6:55:00 PM
m&p-Xylene	9.4		0.44	1.3	ug/m3	1	4/1/2013 6:55:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 6:55:00 PM
Methylene chloride	0.99		0.14	0.53	ug/m3	1	4/1/2013 6:55:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 6:55:00 PM
o-Xylene	2.4		0.19	0.66	ug/m3	1	4/1/2013 6:55:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 6:55:00 PM
Toluene	38		1.5	5.7	ug/m3	10	4/2/2013 5:09:00 PM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 6:55:00 PM
Trichloroethene	8.2		0.36	0.82	ug/m3	1	4/1/2013 6:55:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 6:55:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

5-8-13 JAJ

IA

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:** ~~LA~~-108-A-14A	
Lab Order:	C1304005	**Tag Number:** 360,187	
Project:	Middle River	**Collection Date:** 3/28/2013	
Lab ID:	C1304005-005A	**Matrix:** AIR	

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	< 0.83		0.27	0.83	ug/m3	1	4/1/2013 8:02:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 8:02:00 PM
1,1-Dichloroethane	< 0.62		0.22	0.62	ug/m3	1	4/1/2013 8:02:00 PM
1,1-Dichloroethene	< 0.60		0.22	0.60	ug/m3	1	4/1/2013 8:02:00 PM
1,2,3-Trimethylbenzene	0.80		0.18	0.75	ug/m3	1	4/1/2013 8:02:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 8:02:00 PM
1,2,4-Trimethylbenzene	2.6		0.23	0.75	ug/m3	1	4/1/2013 8:02:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 8:02:00 PM
1,3,5-Trimethylbenzene	0.65	J	0.18	0.75	ug/m3	1	4/1/2013 8:02:00 PM
Benzene	2.5		0.13	0.49	ug/m3	1	4/1/2013 8:02:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 8:02:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 8:02:00 PM
cis-1,2-Dichloroethene	0.64		0.19	0.60	ug/m3	1	4/1/2013 8:02:00 PM
Ethylbenzene	4.6		0.19	0.66	ug/m3	1	4/1/2013 8:02:00 PM
Freon 12	2.5		0.20	0.75	ug/m3	1	4/1/2013 8:02:00 PM
Freon 22	1.5		0.18	0.54	ug/m3	1	4/1/2013 8:02:00 PM
m&p-Xylene	19		4.4	13	ug/m3	10	4/2/2013 6:14:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 8:02:00 PM
Methylene chloride	2.2		0.14	0.53	ug/m3	1	4/1/2013 8:02:00 PM
Naphthalene	0.64	J	0.25	0.80	ug/m3	1	4/1/2013 8:02:00 PM
o-Xylene	9.0		0.19	0.66	ug/m3	1	4/1/2013 8:02:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 8:02:00 PM
Toluene	100		1.5	5.7	ug/m3	10	4/2/2013 6:14:00 PM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 8:02:00 PM
Trichloroethene	5.6		0.36	0.82	ug/m3	1	4/1/2013 8:02:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 8:02:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: *25-Apr-13*

5-8-13 JAJ

IA

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	~~LA~~-118-A-14A
Lab Order:	C1304005	**Tag Number:**	544,295
Project:	Middle River	**Collection Date:**	3/28/2013
Lab ID:	C1304005-002A	**Matrix:**	AIR

Analyses	Result	Qual	MDL	**Limit	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1			**TO-15**			Analyst: **RJP**	
1,1,1-Trichloroethane	1.0		0.27	0.83	ug/m3	1	4/1/2013 6:21:00 PM
1,1,2-Trichloroethane	< 0.83		0.20	0.83	ug/m3	1	4/1/2013 6:21:00 PM
1,1-Dichloroethane	2.8		0.22	0.62	ug/m3	1	4/1/2013 6:21:00 PM
1,1-Dichloroethene	4.2		0.22	0.60	ug/m3	1	4/1/2013 6:21:00 PM
1,2,3-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 6:21:00 PM
1,2,4-Trichlorobenzene	< 1.1		0.45	1.1	ug/m3	1	4/1/2013 6:21:00 PM
1,2,4-Trimethylbenzene	0.60	J	0.23	0.75	ug/m3	1	4/1/2013 6:21:00 PM
1,2-Dichloroethane	< 0.62		0.20	0.62	ug/m3	1	4/1/2013 6:21:00 PM
1,3,5-Trimethylbenzene	< 0.75		0.18	0.75	ug/m3	1	4/1/2013 6:21:00 PM
Benzene	0.65		0.13	0.49	ug/m3	1	4/1/2013 6:21:00 PM
Carbon tetrachloride	< 0.96		0.36	0.96	ug/m3	1	4/1/2013 6:21:00 PM
Chloroform	< 0.74		0.20	0.74	ug/m3	1	4/1/2013 6:21:00 PM
cis-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 6:21:00 PM
Ethylbenzene	1.5		0.19	0.66	ug/m3	1	4/1/2013 6:21:00 PM
Freon 12	2.4		0.20	0.75	ug/m3	1	4/1/2013 6:21:00 PM
Freon 22	7.2		0.18	0.54	ug/m3	1	4/1/2013 6:21:00 PM
m&p-Xylene	8.7		0.44	1.3	ug/m3	1	4/1/2013 6:21:00 PM
Methyl tert-butyl ether	< 0.55		0.24	0.55	ug/m3	1	4/1/2013 6:21:00 PM
Methylene chloride	1.4		0.14	0.53	ug/m3	1	4/1/2013 6:21:00 PM
Naphthalene	< 0.80		0.25	0.80	ug/m3	1	4/1/2013 6:21:00 PM
o-Xylene	2.1		0.19	0.66	ug/m3	1	4/1/2013 6:21:00 PM
Tetrachloroethylene	< 1.0		0.39	1.0	ug/m3	1	4/1/2013 6:21:00 PM
Toluene	40		1.5	5.7	ug/m3	10	4/2/2013 4:35:00 PM
trans-1,2-Dichloroethene	< 0.60		0.19	0.60	ug/m3	1	4/1/2013 6:21:00 PM
Trichloroethene	2.9		0.36	0.82	ug/m3	1	4/1/2013 6:21:00 PM
Vinyl chloride	< 0.39		0.21	0.39	ug/m3	1	4/1/2013 6:21:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Appendix C

Support Documentation

CENTEK LABORATORIES, LLC

Date: *18-Apr-13*

CLIENT: Tetra Tech, Inc.
Project: Middle River
Lab Order: C1304005

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Compendium of Methods for the Determination of Toxic Organic Compounds, Compendium Method TO-15, January 1999 and Centek Laboratories, LLC SOP TS-80:

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objective except as indicated in the corrective action report(s). All samples were received and analyzed within the EPA recommended holding times. Test results are not Method Blank (MB) corrected for contamination.

NYSDEC ASP samples:
Canisters should be evacuated to a reading of less than or equal to 50 millitorr prior to shipment to sampling personnel. The vacuum in the canister will be field checked prior to sampling, and must read 28" of Hg (±2", vacuum, absolute) before a sample can be collected. After the sample has been collected, the pressure of the canister will be read and recorded again, and must be 5" of Hg (±1", vacuum, absolute) for the sample to be valid. Once received at the laboratory, the canister vacuum should be confirmed to be 5" of Hg,±1". Please record and report the pressure/vacuum of received canisters on the sample receipt paperwork. A pressure/vacuum reading should also be taken just prior to the withdrawal of sample from the canister, and recorded on the sample preparation log sheet. All regulators are calibrated to meet these requirements before they leave the laboratory. However, due to environmental conditions and use of the equipment Centek can not guarantee that this criteria can always be achieved.

Centek Chain of Custody

Centek Laboratories
143 Midler Park Drive
Syracuse, NY 13206
315-431-9730
www.CentekLabs.com

Vapor Intrusion & IAQ

Site Name: Middle River
Project: SUANDIAQ
PO#: 112IC04792-03
Quote # Q-1653
Other: BO3569

Detection Limit		Report Level	
☐	5ppbv	☐	Level I
☒	1ug/M3	☐	Level II
☐	1ug/M3 +TCE .25	☒	Cat "B" Like

Turnaround Time:	Check One	Rush TAT Surcharge %	Due Date:
5 Business Days	☒	0%	
4 Business Days	☐	25%	
3 Business Days	☐	50%	
2 Business Days	☐	75%	
Next Day by 5pm	☐	100%	
Next Day by Noon	☐	150%	
Same Day	☐	200%	

Company: Tetra Tech, Inc.

Report to:
Address: 2171 W. Park Court, Suite E
City, State, Zip: Stone Mountain, GA 30087
Email: Eric.Samuels@tetratech.com; Joseph.Samchuck@tetratech.com
Phone: (770) 413-0965

Company:
Check Here If Same: ☒

Invoice to:
Address:
City, State, Zip
Email:
Phone:

Sample ID	Date Sampled	Canister Number	Regulator Number	Analysis Request	Comments TIMES	Vacuum Start/Stop
IA-015-A-14A	3/28/13	556	299	TO15	0924/1739	-18.5/-1
IA-118-A-14A	3/28/13	544	295	TO15	0935/1748	-30/-4
IA-079-A-14A	3/28/13	558	172	TO15	0930/1750	-30/0
IA-076-A-14A	3/28/13	138	1157	TO15	0938/1758	-30/0
IA-108-A-14A	3/28/13	360	187	TO15	0926/1743	-30/-10

Chain of Custody	Print Name	Signature	Date/Time	Courier: CIRCLE ONE
Sampled by:	TONY APANAVAGE		3/29/13 1100	FedEx UPS Pickup/Dropoff
Relinquished by:				For LAB USE ONLY
Received at Lab by:	Jan Scala		4/1/13	Work Order # C1304005

*** By signing Centek Labs Chain of Custody, you are accepting Centek Labs Terms and Conditions listed on the reverse side.

CENTEK LABORATORIES, LLC

Date: *18-Apr-13*

CLIENT: Tetra Tech, Inc.
Project: Middle River
Lab Order: C1304005

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
C1304005-001A	1A-05-A-14A	556,299	3/28/2013	4/1/2013
C1304005-002A	1A-118-A-14A	544,295	3/28/2013	4/1/2013
C1304005-003A	1A-079-A-14A	558,172	3/28/2013	4/1/2013
C1304005-004A	1A-076-A-14A	138,1157	3/28/2013	4/1/2013
C1304005-005A	1A-108-A-14A	360,187	3/28/2013	4/1/2013

CENTEK LABORATORIES, LLC

Sample Receipt Checklist

Client Name: TETRA TECH - ATLANTA

Date and Time Received 4/1/2013

Work Order Number C1304005

Received by: JDS

Checklist completed by _____ 4/1/13 (Signature / Date)

Reviewed by _____ 4/1/13 (Initials / 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?	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/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☑	

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section bel

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

HOLDTIME

SDG C1304005

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV-M3	UG/M3	1A-118-A-14A	C1304005-002A	NM	3/28/2013	4/2/2013	4/2/2013	5	0	5
OV-M3	UG/M3	1A-118-A-14A	C1304005-002A	NM	3/28/2013	4/1/2013	4/1/2013	4	0	4
OV-M3	UG/M3	1A-108-A-14A	C1304005-005A	NM	3/28/2013	4/2/2013	4/2/2013	5	0	5
OV-M3	UG/M3	1A-108-A-14A	C1304005-005A	NM	3/28/2013	4/1/2013	4/1/2013	4	0	4
OV-M3	UG/M3	1A-079-A-14A	C1304005-003A	NM	3/28/2013	4/2/2013	4/2/2013	5	0	5
OV-M3	UG/M3	1A-079-A-14A	C1304005-003A	NM	3/28/2013	4/1/2013	4/1/2013	4	0	4
OV-M3	UG/M3	1A-076-A-14A	C1304005-004A	NM	3/28/2013	4/2/2013	4/2/2013	5	0	5
OV-M3	UG/M3	1A-076-A-14A	C1304005-004A	NM	3/28/2013	4/1/2013	4/1/2013	4	0	4
OV-M3	UG/M3	1A-05-A-14A	C1304005-001A	NM	3/28/2013	4/2/2013	4/2/2013	5	0	5
OV-M3	UG/M3	1A-05-A-14A	C1304005-001A	NM	3/28/2013	4/1/2013	4/1/2013	4	0	4

Injection Log

Directory: C:\HPCHEM\1\DATA

Instrument # 1
Internal Standard Stock # 5491
Standard Stock # 5493
LCS Stock # 5473
Method Ref: EPA TO-15 Jan. 1999

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
221	10	Ak031115.d	1.	C1303012-019A 10X	A305_1UG	11 Mar 2013 21:09
222	10	Ak031116.d	1.	C1303012-023A 10X	A305_1UG	11 Mar 2013 21:42
223	11	Ak031117.d	1.	C1303013-003A 10X	A305_1UG	11 Mar 2013 22:15
224	12	Ak031118.d	1.	C1303013-004A 10X	A305_1UG	11 Mar 2013 22:48
225	13	Ak031119.d	1.	C1303013-005A 10X	A305_1UG	11 Mar 2013 23:21
226	14	Ak031120.d	1.	C1303013-010A 10X	A305_1UG	11 Mar 2013 23:54
227	15	Ak031121.d	1.	C1303013-015A 10X	A305_1UG	12 Mar 2013 00:27
228	16	Ak031122.d	1.	C1303013	A305_1UG-015A 40X	12 Mar 2013 01:00
229	17	Ak031123.d	1.	C1303013-018A 10X	A305_1UG	12 Mar 2013 01:33
230	18	Ak031124.d	1.	C1303013	A305_1UG-018A 40X	12 Mar 2013 02:06
231	19	Ak031125.d	1.	C1303013-019A 10X	A305_1UG	12 Mar 2013 02:38
232	20	Ak031126.d	1.	C1303013	A305_1UG-019A 40X	12 Mar 2013 03:11
233	21	Ak031127.d	1.	ALCS1UGD-031113	A305_1UG	12 Mar 2013 03:44
234	22	Ak031128.d	1.	C1303033-006A 5X	A305_1UG	12 Mar 2013 04:17
235	23	Ak031129.d	1.	C1303033-008A 5X	A305_1UG	12 Mar 2013 04:50
236	24	Ak031130.d	1.	C1303033-001A 5X	A305_1UG	12 Mar 2013 05:23
237	25	Ak031131.d	1.	C1303033-002A 10X	A305_1UG	12 Mar 2013 05:56
238	26	Ak031132.d	1.	C1303033-002A 40X	A305_1UG	12 Mar 2013 06:29
239	27	Ak031133.d	1.	C1303033-003A 10X	A305_1UG	12 Mar 2013 07:02
240	28	Ak031134.d	1.	C1303033-005A 2X	A305_1UG	12 Mar 2013 07:36
241	27	Ak031135.d	1.	C1303033-003A 270X	A305_1UG	12 Mar 2013 08:37
242	28	Ak031136.d	1.	C1303012-014A 90X	A305_1UG	12 Mar 2013 09:10
243	29	Ak031137.d	1.	C1303012-023A 270X	A305_1UG	12 Mar 2013 09:44
244	30	Ak031138.d	1.	C1303012-013A 90X	A305_1UG	12 Mar 2013 10:17
245	31	Ak031139.d	1.	WAC031113A	A305_1UG	12 Mar 2013 10:50
246	31	Ak031140.d	1.	C1303013-015A 90X	A305_1UG	12 Mar 2013 11:24
247		Ak031141.d	1.	No MS or GC data present		
248	1	Ak031301.d	1.	BFB1UG		13 Mar 2013 16:28
249	4	Ak031318.d	1.	A1UG_0.04		14 Mar 2013 01:58
250	5	Ak031319.d	1.	A1UG_		14 Mar 2013 02:30
251	6	Ak031320.d	1.	A1UG_0.10		14 Mar 2013 03:04
252	7	Ak031321.d	1.	A1UG_0.15		14 Mar 2013 03:37
253	8	Ak031322.d	1.	A1UG_		14 Mar 2013 04:11
254	9	Ak031323.d	1.	A1UG_0.30		14 Mar 2013 04:45
255	10	Ak031324.d	1.	A1UG_0.50		14 Mar 2013 05:17
256	11	Ak031325.d	1.	A1UG_0.75		14 Mar 2013 05:51
257	12	Ak031326.d	1.	A1UG_1.0		14 Mar 2013 06:25
258	13	Ak031327.d	1.	A1UG_1.25		14 Mar 2013 06:59
259	14	Ak031328.d	1.	A1UG_1.5		14 Mar 2013 07:35
260	15	Ak031329.d	1.	A1UG_2.0		14 Mar 2013 08:09
261		Ak031330.d	1.	No MS or GC data present		
262	1	Ak031401.d	1.	BFB1UG		14 Mar 2013 08:49
263	2	Ak031402.d	1.	A1UG_1.0		14 Mar 2013 09:38
264	3	Ak031403.d	1.	ALCS1UG-031413		14 Mar 2013 10:12
265	4	Ak031404.d	1.	AMB1UG-031413		14 Mar 2013 10:46
266	5	Ak031405.d	1.	PROF		14 Mar 2013 11:19
267	6	Ak031406.d	1.	PROF 10X		14 Mar 2013 11:52
268	7	Ak031407.d	1.	PROF 40X		14 Mar 2013 12:26
269	1	Ak031408.d	1.	WAC031413A		14 Mar 2013 12:58
270	2	Ak031409.d	1.	WAC031413B		14 Mar 2013 13:32
271	3	Ak031410.d	1.	WAC031413C		14 Mar 2013 14:05
272	4	Ak031411.d	1.	WAC031413D		14 Mar 2013 15:38
273	2	Ak031412.d	1.	WAC031413E		14 Mar 2013 16:11
274	3	Ak031413.d	1.	WAC031413F		14 Mar 2013 16:44
275	4	Ak031414.d	1.	WAC031413G		14 Mar 2013 17:17

Centek Laboratories, LLC

Injection Log

Directory: C:\HPCHEM\1\DATA

Instrument # 1
Internal Standard Stock # 9531
Standard Stock # 9530
LCS Stock # 9532
Method Ref: EPA TO-15 Jan

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	Ak040101.d	1.	BFB1UG	A313_UGM3	1 Apr 2013 09:38
2	2	Ak040102.d	1.	A1UG	A313_UGM3	1 Apr 2013 10:17
3	3	Ak040103.d	1.	A1UG_1.0	A313_UGM3	1 Apr 2013 11:08
4	4	Ak040104.d	1.	ALCS1UG-040113	A313_UGM3	1 Apr 2013 11:42
5	5	Ak040105.d	1.	AMB1UG-040113	A313_UGM3	1 Apr 2013 12:16
6	1	Ak040106.d	1.	WAC040113A	A313_UGM3	1 Apr 2013 12:53
7	2	Ak040107.d	1.	WAC040113B	A313_UGM3	1 Apr 2013 13:27
8	3	Ak040108.d	1.	WAC040113C	A313_UGM3	1 Apr 2013 14:02
9	4	Ak040109.d	1.	WAC040113D	A313_UGM3	1 Apr 2013 14:35
10	5	Ak040110.d	1.	WAC040113E	A313_UGM3	1 Apr 2013 15:08
11	6	Ak040111.d	1.	WAC040113F	A313_UGM3	1 Apr 2013 15:42
12	7	Ak040112.d	1.	WAC040113G	A313_UGM3	1 Apr 2013 16:39
13	8	Ak040113.d	1.	WAC040113H	A313_UGM3	1 Apr 2013 17:14
14	3	Ak040114.d	1.	C1304005-001A	A313_UGM3	1 Apr 2013 17:47
15	4	Ak040115.d	1.	C1304005-002A	A313_UGM3	1 Apr 2013 18:21
16	5	Ak040116.d	1.	C1304005-003A	A313_UGM3	1 Apr 2013 18:55
17	6	Ak040117.d	1.	C1304005-004A	A313_UGM3	1 Apr 2013 19:28
18	7	Ak040118.d	1.	C1304005-005A	A313_UGM3	1 Apr 2013 20:02
19	8	Ak040119.d	1.	C1303079-006A	A313_UGM3	1 Apr 2013 20:37
20	9	Ak040120.d	1.	C1303079-007A	A313_UGM3	1 Apr 2013 21:12
21	10	Ak040121.d	1.	C1303079-008A	A313_UGM3	1 Apr 2013 21:46
22	11	Ak040122.d	1.	C1303079-009A	A313_UGM3	1 Apr 2013 22:21
23	12	Ak040123.d	1.	C1303079-010A	A313_UGM3	1 Apr 2013 22:56
24	41	Ak040124.d	1.	C1303079-001A	A313_UGM3	1 Apr 2013 23:30
25	42	Ak040125.d	1.	C1303079-002A	A313_UGM3	2 Apr 2013 00:06
26	43	Ak040126.d	1.	C1303079-003A	A313_UGM3	2 Apr 2013 00:41
27	44	Ak040127.d	1.	C1303079-004A	A313_UGM3	2 Apr 2013 01:17
28	45	Ak040128.d	1.	C1303079-005A	A313_UGM3	2 Apr 2013 01:52
29	46	Ak040129.d	1.	C1304001-003A	A313_UGM3	2 Apr 2013 02:28
30	47	Ak040130.d	1.	C1304001-004A	A313_UGM3	2 Apr 2013 03:03
31	48	Ak040131.d	1.	C1304001-001A	A313_UGM3	2 Apr 2013 03:39
32	49	Ak040132.d	1.	C1304001-002A	A313_UGM3	2 Apr 2013 04:14
33	50	Ak040133.d	1.	ALCS1UGD-040113	A313_UGM3	2 Apr 2013 04:50
34	51	Ak040134.d	1.	C1303079-006A 10x	A313_UGM3	2 Apr 2013 05:24
35	52	Ak040135.d	1.	C1303079-007A 10x	A313_UGM3	2 Apr 2013 05:59
36	53	Ak040136.d	1.	C1303079-008A 10x	A313_UGM3	2 Apr 2013 06:33
37	54	Ak040137.d	1.	C1303079-009A 10x	A313_UGM3	2 Apr 2013 07:07
38	55	Ak040138.d	1.	C1303079-010A 10x	A313_UGM3	2 Apr 2013 07:42
39	56	Ak040139.d	1.	C1303079-001A 10x	A313_UGM3	2 Apr 2013 08:17
40	57	Ak040140.d	1.	C1303079-002A 10x	A313_UGM3	2 Apr 2013 08:51
41	58	Ak040141.d	1.	C1303079-003A 10x	A313_UGM3	2 Apr 2013 09:24
42	59	Ak040142.d	1.	C1303079-004A 10x	A313_UGM3	2 Apr 2013 09:57
43		Ak040143.d	1.	No MS or GC data present		
44	1	Ak040201.d	1.	BFB1UG	A313_UGM3	2 Apr 2013 13:01
45	2	Ak040202.d	1.	A1UG_1.0	A313_UGM3	2 Apr 2013 13:47
46	3	Ak040203.d	1.	ALCS1UG-040213	A313_UGM3	2 Apr 2013 14:20
47	4	Ak040204.d	1.	AMB1UG-040213	A313_UGM3	2 Apr 2013 14:53
48	1	Ak040205.d	1.	C1304005-001A 10x	A313_UGM3	2 Apr 2013 16:03
49	2	Ak040206.d	1.	C1304005-002A 10x	A313_UGM3	2 Apr 2013 16:35
50	3	Ak040207.d	1.	C1304005-003A 10x	A313_UGM3	2 Apr 2013 17:09
51	4	Ak040208.d	1.	C1304005-004A 10x	A313_UGM3	2 Apr 2013 17:42
52	5	Ak040209.d	1.	C1304005-005A 10x	A313_UGM3	2 Apr 2013 18:14
53	6	Ak040210.d	1.	C1303079-001A 40x	A313_UGM3	2 Apr 2013 18:48
54	7	Ak040211.d	1.	C1303079-002A 40x	A313_UGM3	2 Apr 2013 19:21
55	8	Ak040212.d	1.	C1303079-003A 40x	A313_UGM3	2 Apr 2013 19:55

Centek Laboratories, LLC
Directory: C:\HPCHEM\1\DATA

Injection Log

Instrument # 1
Internal Standard Stock # 9531
Standard Stock # 9530
Misc Info Stock # 9532
Method Ref: EPA TO-15 / Jan. 1

Line	Vial	FileName	Multiplier	SampleName		Injected
56	9	Ak040213.d	1.	C1303079-004A 10x	A313_UGM3	2 Apr 2013 20:29
57	10	Ak040214.d	1.	C1303079-004A 40x	A313_UGM3	2 Apr 2013 21:03
58	11	Ak040215.d	1.	C1303079-005A 10x	A313_UGM3	2 Apr 2013 21:36
59	12	Ak040216.d	1.	C1303079-005A 40x	A313_UGM3	2 Apr 2013 22:09
60	13	Ak040217.d	1.	C1304001-003A 10x	A313_UGM3	2 Apr 2013 22:42
61	14	Ak040218.d	1.	C1304001-004A 10x	A313_UGM3	2 Apr 2013 23:15
62	15	Ak040219.d	1.	C1304001-001A 10x	A313_UGM3	2 Apr 2013 23:48
63	16	Ak040220.d	1.	C1304001-001A 40x	A313_UGM3	3 Apr 2013 00:22
64	17	Ak040221.d	1.	C1304001-002A 10x	A313_UGM3	3 Apr 2013 00:57
65	18	Ak040222.d	1.	C1304001-002A 40x	A313_UGM3	3 Apr 2013 01:31
66	19	Ak040223.d	1.	ALCS1UGD-040213	A313_UGM3	3 Apr 2013 02:06
67		Ak040224.d	1.	No MS or GC data present		
68	1	Ak040301.d	1.	BFB1UG	A313_UGM3	3 Apr 2013 08:37
69	2	Ak040302.d	1.	A1UG_1.0	A313_UGM3	3 Apr 2013 09:19
70	3	Ak040303.d	1.	ALCS1UG-040313	A313_UGM3	3 Apr 2013 09:58
71	4	Ak040304.d	1.	AMB1UG-040313	A313_UGM3	3 Apr 2013 10:31
72	5	Ak040305.d	1.	C1303079-001A 810X	A313_UGM3	3 Apr 2013 11:38
73	6	Ak040306.d	1.	C1303079-001A 7290X	A313_UGM3	3 Apr 2013 12:12
74	7	Ak040307.d	1.	C1303079-002A 810X	A313_UGM3	3 Apr 2013 12:45
75	9	Ak040308.d	1.	C1303079-003A 810X	A313_UGM3	3 Apr 2013 13:19
76	10	Ak040309.d	1.	C1303079-004A 810X	A313_UGM3	3 Apr 2013 13:52
77	11	Ak040310.d	1.	C1303079-004A 1620X	A313_UGM3	3 Apr 2013 14:25
78	11	Ak040311.d	1.	C1303079-005A 2430X	A313_UGM3	3 Apr 2013 14:58
79	12	Ak040312.d	1.	C1303079-005A 9720X	A313_UGM3	3 Apr 2013 15:32
80	12	Ak040313.d	1.	C1303079-003A 1620X	A313_UGM3	3 Apr 2013 16:05
81	14	Ak040314.d	1.	form	A313_UGM3	3 Apr 2013 17:29
82	16	Ak040315.d	1.	C1304012-001A 10X	A313_UGM3	3 Apr 2013 17:58
83	17	Ak040316.d	1.	C1304012-001A 40X	A313_UGM3	3 Apr 2013 18:32
84	18	Ak040317.d	1.	C1304012-001A	A313_UGM3	3 Apr 2013 19:06
85	18	Ak040318.d	1.	C1304012-001A 810x	A313_UGM3	4 Apr 2013 08:00
86	20	Ak040319.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 20:13
87	21	Ak040320.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 20:47
88	22	Ak040321.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 21:20
89	23	Ak040322.d	1.	FORM GAS	A313_UGM3	3 Apr 2013 21:53
90	24	Ak040323.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 22:26
91	25	Ak040324.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 23:00
92	26	Ak040325.d	1.	FORM h2o	A313_UGM3	3 Apr 2013 23:34
93	27	Ak040326.d	1.	FORM h2o	A313_UGM3	4 Apr 2013 00:09
94	1	Ak040401.d	1.	BFB1UG	A313_UGM3	4 Apr 2013 08:37
95	2	Ak040402.d	1.	A1UG	A313_UGM3	4 Apr 2013 09:15
96	3	Ak040403.d	1.	A1UG	A313_UGM3	4 Apr 2013 09:57
97	4	Ak040404.d	1.	WAC040413A N	A313_UGM3	4 Apr 2013 10:43
98	5	Ak040405.d	1.	WAC040413B	A313_UGM3	4 Apr 2013 11:17
99	6	Ak040406.d	1.	WAC040413C	A313_UGM3	4 Apr 2013 11:50
100	7	Ak040407.d	1.	WAC040413D	A313_UGM3	4 Apr 2013 12:23
101	8	Ak040408.d	1.	WAC040413E	A313_UGM3	4 Apr 2013 12:57
102	9	Ak040409.d	1.	WAC040413F	A313_UGM3	4 Apr 2013 13:33
103		Ak040410.d	1.	No MS or GC data present		
104	31	Ak040501.d	1.	BFBFORM		5 Apr 2013 08:22
105	31	Ak040502.d	1.	AFORM100		5 Apr 2013 09:11
106	32	Ak040503.d	1.	AFORM75		5 Apr 2013 09:46
107	33	Ak040504.d	1.	AFORM50		5 Apr 2013 10:20
108	34	Ak040505.d	1.	AFORM25		5 Apr 2013 10:53
109	35	Ak040506.d	1.	AFORM10		5 Apr 2013 11:26
110	36	Ak040507.d	1.	ALCSF-040513		5 Apr 2013 11:59

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
1)	I	Bromochloromethane	----------ISTD----------							
2)	T	Freon 22			3.081	2.495	2.258	2.251	2.318	14.51
3)	T	Propylene			0.902	0.799	0.840	0.745	0.750	11.67
4)	T	Freon 12			6.430	5.238	4.955	4.831	4.997	12.39
5)	T	Chloromethane			1.576	1.477	1.232	1.226	1.260	14.29
6)	T	Freon 114			4.946	4.059	3.737	3.681	3.803	13.25
7)	T	Vinyl Chloride	1.539	1.228	1.254	1.180	1.065	1.076	1.130	15.65
8)	T	1,3-butadiene			0.931	0.818	0.703	0.790	0.796	11.00
9)	T	Bromomethane			1.682	1.356	1.335	1.286	1.314	12.22
10)	T	Ethanol				0.297	0.301	0.267	0.267	11.24
11)	T	Acrolein			0.348	0.266	0.253	0.316	0.268	15.80
12)	T	Chloroethane			0.598	0.607	0.515	0.503	0.507	12.58
13)	T	Vinyl Bromide			1.779	1.426	1.436	1.387	1.388	12.57
14)	T	Freon 11			7.033	5.436	5.167	5.090	5.257	14.29
15)	T	Acetone				0.494	0.434	0.464	0.435	8.75
16)	T	Isopropyl alcoh			1.606	1.386	1.334	1.364	1.284	13.47
17)	T	1,1-dichloroeth			1.403	1.317	1.136	1.106	1.151	11.64
18)	T	Freon 113			3.698	2.902	2.731	2.739	2.759	14.84
19)	t	t-Butyl alcohol			2.837	2.073	2.026	1.999	2.053	16.43
20)	T	Methylene chlor			1.210	1.099	0.999	0.939	0.968	13.24
21)	T	Allyl chloride			1.877	1.966	1.500	1.482	1.546	15.52
22)	T	Carbon disulfid			4.597	3.489	3.093	3.120	3.221	18.55
23)	T	trans-1,2-dichl			2.028	1.600	1.480	1.589	1.584	11.75
24)	T	methyl tert-but			3.872	3.220	2.988	2.808	3.063	11.56
25)	T	1,1-dichloroeth			3.052	2.440	2.194	2.322	2.323	13.53
26)	T	Vinyl acetate			2.495	1.506	1.629	1.914	1.790	17.55
27)	T	Methyl Ethyl Ke				0.366	0.396	0.398	0.379	4.47
28)	T	cis-1,2-dichlor			1.896	1.355	1.459	1.335	1.439	13.09
29)	T	Hexane			1.592	1.227	1.174	1.282	1.268	10.97
30)	T	Ethyl acetate			2.170	1.847	1.715	1.754	1.802	8.91
31)	T	Chloroform			4.440	3.414	3.311	3.200	3.318	14.33
32)	T	Tetrahydrofuran			0.952	0.885	0.776	0.747	0.780	11.53
33)	T	1,2-dichloroeth			2.949	2.320	2.209	2.204	2.258	12.92
34)	I	1,4-difluorobenzene	----------ISTD----------							
35)	T	1,1,1-trichloro			1.691	1.197	1.110	1.124	1.155	19.49
36)	T	Cyclohexane			0.454	0.362	0.344	0.347	0.364	10.62
37)	T	Carbon tetrachl	2.306	1.702	1.954	1.379	1.339	1.321	1.492	25.15
38)	T	Benzene			1.169	0.940	0.930	0.890	0.910	12.50
39)	T	Methyl methacry			0.372	0.258	0.260	0.273	0.277	14.13
40)	T	1,4-dioxane				0.129	0.111	0.112	0.113	6.79
41)	T	2,2,4-trimethyl			1.581	1.160	1.122	1.111	1.175	14.30
42)	T	Heptane			0.557	0.386	0.375	0.349	0.389	17.92
43)	T	Trichloroethene	0.771	0.585	0.694	0.512	0.490	0.476	0.541	20.17
44)	T	1,2-dichloropro			0.469	0.354	0.351	0.341	0.350	14.45
45)	T	Bromodichlorome			1.483	1.087	1.074	1.029	1.076	15.84
46)	T	cis-1,3-dichlor			0.661	0.457	0.457	0.467	0.482	15.14
47)	T	trans-1,3-dichl			0.564	0.407	0.452	0.422	0.455	10.95
48)	T	1,1,2-trichloro			0.657	0.492	0.488	0.454	0.485	14.88
49)	I	Chlorobenzene-d5	----------ISTD----------							
50)	T	Toluene			0.844	0.608	0.629	0.623	0.648	12.47
51)	T	Methyl Isobutyl				0.475	0.458	0.455	0.432	8.76

(#) = Out of Range ### Number of calibration levels exceeded format ###

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
52)	T	Dibromochlorome			1.638	1.173	1.108	1.073	1.141	18.20
53)	T	Methyl Butyl Ke				0.318	0.302	0.288	0.289	7.94
54)	T	1,2-dibromoetha			1.038	0.716	0.742	0.742	0.753	15.64
55)	T	Tetrachloroethy	1.204	0.802	0.927	0.662	0.660	0.642	0.728	27.38
56)	T	Chlorobenzene			1.422	1.010	1.025	1.004	1.038	15.23
57)	T	Ethylbenzene			1.717	1.238	1.329	1.351	1.395	10.54
58)	T	m&p-xylene			1.264	0.940	1.018	1.089	1.120	10.07
59)	T	Styrene			0.755	0.574	0.644	0.657	0.683	9.97
60)	T	Bromoform			1.415	1.046	1.061	1.055	1.065	13.71
61)	T	o-xylene			1.767	1.273	1.367	1.476	1.471	12.17
62)	S	Bromofluorobenz	0.528	0.511	0.561	0.568	0.580	0.584	0.572	5.48
63)	T	1,1,2,2-tetrach			1.298	0.917	0.953	0.967	0.978	13.44
64)	T	2-Chlorotoluene			1.513	1.121	1.058	1.073	1.138	14.08
65)	T	4-ethyltoluene			1.164	0.928	0.960	1.063	1.116	11.90
66)	T	1,3,5-trimethyl			1.779	1.363	1.450	1.435	1.516	8.44
67)	T	1,2,4-trimethyl			1.145	0.850	0.974	1.050	1.095	14.38
68)	T	1,3-dichloroben			0.961	0.731	0.825	0.894	0.895	10.72
69)	T	benzyl chloride			0.946	0.662	0.675	0.698	0.794	14.70
70)	T	1,4-dichloroben			0.894	0.746	0.750	0.822	0.850	11.35
71)	T	1,2,3-trimethyl			1.335	1.032	1.121	1.227	1.298	14.02
72)	T	1,2-dichloroben			1.048	0.805	0.859	0.921	0.920	9.22
73)	T	1,2,4-trichloro			0.551	0.576	0.492	0.500	0.541	10.80
74)	T	Naphthalene			0.975	0.854	0.741	0.812	0.859	10.87
75)	T	Hexachloro-1,3-			1.135	0.863	0.991	0.923	0.947	9.68

(#) = Out of Range ### Number of calibration levels exceeded format ###

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\AK040103.D Vial: 3
Acq On : 1 Apr 2013 11:08 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:13 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane	1.000	1.000	0.0	156#	0.00
2	T	Freon 22	2.318	2.422	-4.5	175#	0.00
3	T	Propylene	0.750	0.662	11.7	153#	0.00
4	T	Freon 12	4.997	5.079	-1.6	171#	0.00
5	T	Chloromethane	1.260	1.315	-4.4	179#	0.00
6	T	Freon 114	3.803	4.029	-5.9	181#	0.00
7	T	Vinyl Chloride	1.130	1.085	4.0	172#	0.00
8	T	1,3-butadiene	0.796	0.779	2.1	139	0.00
9	T	Bromomethane	1.314	1.338	-1.8	173#	0.00
10	T	Ethanol	0.267	0.236	11.6	142	0.00
11	T	Acrolein	0.268	0.243	9.3	159#	0.00
12	T	Chloroethane	0.507	0.515	-1.6	172#	0.00
13	T	Vinyl Bromide	1.388	1.462	-5.3	178#	0.00
14	T	Freon 11	5.257	5.786	-10.1	185#	0.00
15	T	Acetone	0.435	0.464	-6.7	183#	0.00
16	T	Isopropyl alcohol	1.284	1.217	5.2	164#	0.00
17	T	1,1-dichloroethene	1.151	1.204	-4.6	178#	0.00
18	T	Freon 113	2.759	2.963	-7.4	182#	0.00
19	t	t-Butyl alcohol	2.053	1.819	11.4	152#	0.00
20	T	Methylene chloride	0.968	1.054	-8.9	182#	0.00
21	T	Allyl chloride	1.546	1.414	8.5	164#	0.00
22	T	Carbon disulfide	3.221	3.287	-2.0	180#	0.00
23	T	trans-1,2-dichloroethene	1.584	1.525	3.7	160#	0.00
24	T	methyl tert-butyl ether	3.063	2.192	28.4	116	0.00
25	T	1,1-dichloroethane	2.323	2.221	4.4	160#	0.00
26	T	Vinyl acetate	1.790	1.414	21.0	132	0.00
27	T	Methyl Ethyl Ketone	0.379	0.311	17.9	128	0.00
28	T	cis-1,2-dichloroethene	1.439	1.198	16.7	135	0.00
29	T	Hexane	1.268	1.053	17.0	143	0.00
30	T	Ethyl acetate	1.802	1.498	16.9	141	0.00
31	T	Chloroform	3.318	3.260	1.7	166#	0.00
32	T	Tetrahydrofuran	0.780	0.575	26.3	123	0.00
33	T	1,2-dichloroethane	2.258	2.088	7.5	154#	0.00
34	I	1,4-difluorobenzene	1.000	1.000	0.0	130	0.00
35	T	1,1,1-trichloroethane	1.155	1.306	-13.1	163#	0.00
36	T	Cyclohexane	0.364	0.356	2.2	135	0.00
37	T	Carbon tetrachloride	1.492	1.592	-6.7	165#	0.00
38	T	Benzene	0.910	0.967	-6.3	148	0.00
39	T	Methyl methacrylate	0.277	0.221	20.2	114	0.00
40	T	1,4-dioxane	0.113	0.099	12.4	123	0.00
41	T	2,2,4-trimethylpentane	1.175	1.210	-3.0	144	0.00
42	T	Heptane	0.389	0.395	-1.5	144	0.00
43	T	Trichloroethene	0.541	0.538	0.6	151#	0.00
44	T	1,2-dichloropropane	0.350	0.407	-16.3	164#	0.00
45	T	Bromodichloromethane	1.076	1.235	-14.8	162#	0.00
46	T	cis-1,3-dichloropropene	0.482	0.426	11.6	125	0.00
47	T	trans-1,3-dichloropropene	0.455	0.404	11.2	122	0.00
48	T	1,1,2-trichloroethane	0.485	0.531	-9.5	153#	0.00
49	I	Chlorobenzene-d5	1.000	1.000	0.0	142	0.00

(#) = Out of Range

Data File : C:\HPCHEM\1\DATA\AK040103.D Vial: 3
Acq On : 1 Apr 2013 11:08 am Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:13 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
50	T	Toluene	0.648	0.552	14.8	125	0.00
51	T	Methyl Isobutyl Ketone	0.432	0.379	12.3	138	0.00
52	T	Dibromochloromethane	1.141	1.084	5.0	145	0.00
53	T	Methyl Butyl Ketone	0.289	0.302	-4.5	163#	0.00
54	T	1,2-dibromoethane	0.753	0.694	7.8	140	0.00
55	T	Tetrachloroethylene	0.728	0.603	17.2	139	0.00
56	T	Chlorobenzene	1.038	0.920	11.4	134	0.00
57	T	Ethylbenzene	1.395	1.116	20.0	119	0.00
58	T	m&p-xylene	1.120	0.965	13.8	124	0.00
59	T	Styrene	0.683	0.544	20.4	116	0.00
60	T	Bromoform	1.065	0.873	18.0	126	0.00
61	T	o-xylene	1.471	1.272	13.5	144	0.00
62	S	Bromofluorobenzene	0.572	0.530	7.3	127	0.00
63	T	1,1,2,2-tetrachloroethane	0.978	0.978	0.0	151#	0.00
64	T	2-Chlorotoluene	1.138	0.951	16.4	131	0.00
65	T	4-ethyltoluene	1.116	0.978	12.4	126	0.00
66	T	1,3,5-trimethylbenzene	1.516	1.296	14.5	127	0.00
67	T	1,2,4-trimethylbenzene	1.095	0.829	24.3	112	0.00
68	T	1,3-dichlorobenzene	0.895	0.771	13.9	127	0.00
69	T	benzyl chloride	0.794	0.736	7.3	118	0.00
70	T	1,4-dichlorobenzene	0.850	0.680	20.0	122	0.00
71	T	1,2,3-trimethylbenzene	1.298	1.146	11.7	129	0.00
72	T	1,2-dichlorobenzene	0.920	0.747	18.8	124	0.00
73	T	1,2,4-trichlorobenzene	0.541	0.443	18.1	128	0.00
74	T	Naphthalene	0.859	0.616	28.3	114	0.00
75	T	Hexachloro-1,3-butadiene	0.947	0.867	8.4	142	0.00

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\AK040202.D Vial: 2
Acq On : 2 Apr 2013 1:47 pm Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane	1.000	1.000	0.0	135	0.00
2	T	Freon 22	2.318	2.490	-7.4	156#	0.00
3	T	Propylene	0.750	0.673	10.3	134	0.00
4	T	Freon 12	4.997	5.126	-2.6	149	0.00
5	T	Chloromethane	1.260	1.270	-0.8	150	0.00
6	T	Freon 114	3.803	4.060	-6.8	158#	0.00
7	T	Vinyl Chloride	1.130	1.120	0.9	154#	0.00
8	T	1,3-butadiene	0.796	0.735	7.7	114	-0.01
9	T	Bromomethane	1.314	1.431	-8.9	160#	0.00
10	T	Ethanol	0.267	0.276	-3.4	144	0.00
11	T	Acrolein	0.268	0.270	-0.7	153#	-0.02
12	T	Chloroethane	0.507	0.499	1.6	144	0.00
13	T	Vinyl Bromide	1.388	1.449	-4.4	153#	-0.01
14	T	Freon 11	5.257	6.200	-17.9	171#	0.00
15	T	Acetone	0.435	0.531	-22.1	181#	-0.02
16	T	Isopropyl alcohol	1.284	1.407	-9.6	164#	-0.02
17	T	1,1-dichloroethene	1.151	1.229	-6.8	157#	-0.01
18	T	Freon 113	2.759	3.022	-9.5	161#	0.00
19	t	t-Butyl alcohol	2.053	2.261	-10.1	164#	-0.02
20	T	Methylene chloride	0.968	1.043	-7.7	156#	0.00
21	T	Allyl chloride	1.546	1.612	-4.3	162#	-0.02
22	T	Carbon disulfide	3.221	3.297	-2.4	156#	-0.01
23	T	trans-1,2-dichloroethene	1.584	1.682	-6.2	153#	-0.02
24	T	methyl tert-butyl ether	3.063	3.022	1.3	139	-0.02
25	T	1,1-dichloroethane	2.323	2.272	2.2	142	-0.02
26	T	Vinyl acetate	1.790	1.390	22.3	112	-0.03
27	T	Methyl Ethyl Ketone	0.379	0.369	2.6	132	-0.03
28	T	cis-1,2-dichloroethene	1.439	1.266	12.0	124	0.00
29	T	Hexane	1.268	0.946	25.4	111	-0.02
30	T	Ethyl acetate	1.802	1.775	1.5	145	-0.02
31	T	Chloroform	3.318	3.285	1.0	145	-0.02
32	T	Tetrahydrofuran	0.780	0.644	17.4	119	-0.02
33	T	1,2-dichloroethane	2.258	2.123	6.0	135	-0.03
34	I	1,4-difluorobenzene	1.000	1.000	0.0	107	-0.02
35	T	1,1,1-trichloroethane	1.155	1.349	-16.8	139	-0.02
36	T	Cyclohexane	0.364	0.359	1.4	113	-0.01
37	T	Carbon tetrachloride	1.492	1.704	-14.2	145	-0.02
38	T	Benzene	0.910	0.994	-9.2	125	-0.03
39	T	Methyl methacrylate	0.277	0.256	7.6	109	-0.03
40	T	1,4-dioxane	0.113	0.158	-39.8#	161#	-0.04
41	T	2,2,4-trimethylpentane	1.175	1.205	-2.6	118	-0.01
42	T	Heptane	0.389	0.386	0.8	116	-0.01
43	T	Trichloroethene	0.541	0.564	-4.3	130	-0.02
44	T	1,2-dichloropropane	0.350	0.403	-15.1	134	0.00
45	T	Bromodichloromethane	1.076	1.319	-22.6	142	-0.01
46	T	cis-1,3-dichloropropene	0.482	0.491	-1.9	119	-0.01
47	T	trans-1,3-dichloropropene	0.455	0.450	1.1	112	-0.02
48	T	1,1,2-trichloroethane	0.485	0.586	-20.8	139	-0.01
49	I	Chlorobenzene-d5	1.000	1.000	0.0	116	-0.01

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\AK040202.D Vial: 2
Acq On : 2 Apr 2013 1:47 pm Operator: RJP
Sample : A1UG_1.0 Inst : MSD #1
Misc : A313_UGM3 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
50	T	Toluene	0.648	0.610	5.9	113	-0.01
51	T	Methyl Isobutyl Ketone	0.432	0.549	-27.1	163#	-0.01
52	T	Dibromochloromethane	1.141	1.203	-5.4	131	-0.01
53	T	Methyl Butyl Ketone	0.289	0.415	43.6#	182#	-0.04
54	T	1,2-dibromoethane	0.753	0.786	-4.4	130	-0.01
55	T	Tetrachloroethylene	0.728	0.683	6.2	128	-0.01
56	T	Chlorobenzene	1.038	1.018	1.9	121	0.00
57	T	Ethylbenzene	1.395	1.254	10.1	109	-0.01
58	T	m&p-xylene	1.120	1.093	2.4	115	-0.01
59	T	Styrene	0.683	0.614	10.1	107	0.00
60	T	Bromoform	1.065	0.929	12.8	109	-0.01
61	T	o-xylene	1.471	1.450	1.4	134	-0.01
62	S	Bromofluorobenzene	0.572	0.558	2.4	109	-0.01
63	T	1,1,2,2-tetrachloroethane	0.978	1.074	-9.8	136	-0.01
64	T	2-Chlorotoluene	1.138	1.009	11.3	113	-0.01
65	T	4-ethyltoluene	1.116	1.059	5.1	111	-0.01
66	T	1,3,5-trimethylbenzene	1.516	1.409	7.1	112	-0.01
67	T	1,2,4-trimethylbenzene	1.095	0.904	17.4	100	-0.01
68	T	1,3-dichlorobenzene	0.895	0.842	5.9	113	0.00
69	T	benzyl chloride	0.794	0.852	-7.3	112	0.00
70	T	1,4-dichlorobenzene	0.850	0.825	2.9	120	0.00
71	T	1,2,3-trimethylbenzene	1.298	1.355	-4.4	125	0.00
72	T	1,2-dichlorobenzene	0.920	0.874	5.0	118	0.00
73	T	1,2,4-trichlorobenzene	0.541	0.393	27.4	92	0.02
74	T	Naphthalene	0.859	0.736	14.3	111	0.03
75	T	Hexachloro-1,3-butadiene	0.947	1.013	-7.0	136	0.05

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

CENTEK LABORATORIES, LLC

Date: *18-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID AMB1UG-040113	SampType: MBLK	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6815
Client ID: ZZZZZ	Batch ID: R6815	TestNo: TO-15		Analysis Date: 4/1/2013	SeqNo: 80487

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	< 0.15	0.15									
1,1,2-Trichloroethane	< 0.15	0.15									
1,1-Dichloroethane	< 0.15	0.15									
1,1-Dichloroethene	< 0.15	0.15									
1,2,3-Trimethylbenzene	< 0.15	0.15									
1,2,4-Trichlorobenzene	< 0.15	0.15									
1,2,4-Trimethylbenzene	< 0.15	0.15									
1,2-Dichloroethane	< 0.15	0.15									
1,3,5-Trimethylbenzene	< 0.15	0.15									
Benzene	< 0.15	0.15									
Carbon tetrachloride	< 0.15	0.15									
Chloroform	< 0.15	0.15									
cis-1,2-Dichloroethene	< 0.15	0.15									
Ethylbenzene	< 0.15	0.15									
Freon 12	< 0.15	0.15									
Freon 22	< 0.15	0.15									
m&p-Xylene	< 0.30	0.30									
Methyl tert-butyl ether	< 0.15	0.15									
Methylene chloride	< 0.15	0.15									
Naphthalene	< 0.15	0.15									
o-Xylene	< 0.15	0.15									
Tetrachloroethylene	< 0.15	0.15									
Toluene	< 0.15	0.15									
trans-1,2-Dichloroethene	< 0.15	0.15									
Trichloroethene	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID	AMB1UG-040113	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6815
Client ID:	ZZZZZ	Batch ID:	R6815	TestNo:	TO-15			Analysis Date:	4/1/2013	SeqNo:	80487

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	< 0.15	0.15									

Sample ID	AMB1UG-040213	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6816
Client ID:	ZZZZZ	Batch ID:	R6816	TestNo:	TO-15			Analysis Date:	4/2/2013	SeqNo:	80495

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	< 0.15	0.15									
1,1,2-Trichloroethane	< 0.15	0.15									
1,1-Dichloroethane	< 0.15	0.15									
1,1-Dichloroethene	< 0.15	0.15									
1,2,3-Trimethylbenzene	< 0.15	0.15									
1,2,4-Trichlorobenzene	< 0.15	0.15									
1,2,4-Trimethylbenzene	< 0.15	0.15									
1,2-Dichloroethane	< 0.15	0.15									
1,3,5-Trimethylbenzene	< 0.15	0.15									
Benzene	< 0.15	0.15									
Carbon tetrachloride	< 0.15	0.15									
Chloroform	< 0.15	0.15									
cis-1,2-Dichloroethene	< 0.15	0.15									
Ethylbenzene	< 0.15	0.15									
Freon 12	< 0.15	0.15									
Freon 22	< 0.15	0.15									
m&p-Xylene	< 0.30	0.30									
Methyl tert-butyl ether	< 0.15	0.15									
Methylene chloride	< 0.15	0.15									
Naphthalene	< 0.15	0.15									
o-Xylene	< 0.15	0.15									
Tetrachloroethylene	< 0.15	0.15									
Toluene	< 0.15	0.15									
trans-1,2-Dichloroethene	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID	AMB1UG-040213	SampType:	MBLK	TestCode:	1ugM3_FullLi	Units:	ppbV	Prep Date:		RunNo:	6816
Client ID:	ZZZZZ	Batch ID:	R6816	TestNo:	TO-15			Analysis Date:	4/2/2013	SeqNo:	80496

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	< 0.15	0.15									
Vinyl chloride	< 0.15	0.15									

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CENTEK LABORATORIES, LLC

Date: 18-Apr-13

QC SUMMARY REPORT
SURROGATE RECOVERIES

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River
Test No: TO-15 **Matrix:** A

Sample ID	BR4FBZ							
ALCS1UG-040113	88.0							
ALCS1UG-040213	97.0							
ALCS1UGD-040213	96.0							
AMB1UG-040113	80.0							
AMB1UG-040213	85.0							
C1304005-001A	96.0							
C1304005-002A	92.0							
C1304005-003A	84.0							
C1304005-004A	96.0							
C1304005-005A	102							

Acronym		Surrogate	QC Limits
BR4FBZ	=	Bromofluorobenzene	70-130

*** Surrogate recovery outside acceptance limits**

1

Tune File : C:\HPCHEM\1\DATA\AK040103.D
Tune Time : 1 Apr 2013 11:08 am

Daily Calibration File : C:\HPCHEM\1\DATA\AK040103.D

			(BFB)	(IS1)	(IS2)	(IS3)
				31058	91071	93962
File	Sample	DL	Surrogate Recovery %	Internal Standard Responses		
AK040104.D	ALCS1UG-040113	88		31533	88841	91050
AK040105.D	AMB1UG-040113	80		31969	86649	79570
AK040114.D	C1304005-001A	96		30203	87005	97018
AK040115.D	C1304005-002A	92		33704	96038	112542
AK040116.D	C1304005-003A	84		33850	96543	126966
AK040117.D	C1304005-004A	96		32923	93870	97692
AK040118.D	C1304005-005A	102		32458	98713	106408
AK040133.D	ALCS1UGD-040113	98		33175	92050	96717

t - fails 24hr time check * - fails criteria

Created: Thu Apr 18 10:00:17 2013 MSD #1/

Tune File : C:\HPCHEM\1\DATA\AK040202.D
Tune Time : 2 Apr 2013 1:47 pm

Daily Calibration File : C:\HPCHEM\1\DATA\AK040202.D

			(BFB)	(IS1)	(IS2)	(IS3)
				26866	74937	76628
File	Sample	DL	Surrogate Recovery %	Internal Standard Responses		
AK040203.D	ALCS1UG-040213		97	29108	83914	84810
AK040204.D	AMB1UG-040213		85	25813	69871	60061
AK040205.D	C1304005-001A	10x	84	27468	76530	75026
AK040206.D	C1304005-002A	10x	82	27594	78156	77637
AK040207.D	C1304005-003A	10x	82	26763	74657	79249
AK040208.D	C1304005-004A	10x	85	26345	72297	70296
AK040209.D	C1304005-005A	10x	82	27538	80470	75911
AK040223.D	ALCS1UGD-040213		96	26835	77396	77946

t - fails 24hr time check * - fails criteria

Created: Thu Apr 18 10:01:57 2013 MSD #1/

CENTEK LABORATORIES, LLC

Date: *18-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UG-040113	SampType: LCS	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6815
Client ID: ZZZZZ	Batch ID: R6815	TestNo: TO-15		Analysis Date: 4/1/2013	SeqNo: 80488

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.100	0.15	1	0	110	70	130				
1,1,2-Trichloroethane	1.110	0.15	1	0	111	70	130				
1,1-Dichloroethane	0.8600	0.15	1	0	86.0	70	130				
1,1-Dichloroethene	0.9500	0.15	1	0	95.0	70	130				
1,2,4-Trichlorobenzene	0.8400	0.15	1	0	84.0	70	130				
1,2,4-Trimethylbenzene	0.7400	0.15	1	0	74.0	70	130				
1,2-Dichloroethane	0.8700	0.15	1	0	87.0	70	130				
1,3,5-Trimethylbenzene	0.8100	0.15	1	0	81.0	70	130				
Benzene	1.070	0.15	1	0	107	70	130				
Carbon tetrachloride	1.060	0.15	1	0	106	70	130				
Chloroform	0.9400	0.15	1	0	94.0	70	130				
cis-1,2-Dichloroethene	0.8300	0.15	1	0	83.0	70	130				
Ethylbenzene	0.7700	0.15	1	0	77.0	70	130				
Freon 12	0.9600	0.15	1	0	96.0	70	130				
m&p-Xylene	1.680	0.30	2	0	84.0	70	130				
Methyl tert-butyl ether	0.8700	0.15	1	0	87.0	70	130				
Methylene chloride	0.9600	0.15	1	0	96.0	70	130				
o-Xylene	0.8400	0.15	1	0	84.0	70	130				
Tetrachloroethylene	0.8100	0.15	1	0	81.0	70	130				
Toluene	0.8500	0.15	1	0	85.0	70	130				
trans-1,2-Dichloroethene	0.9900	0.15	1	0	99.0	70	130				
Trichloroethene	0.9400	0.15	1	0	94.0	70	130				
Vinyl chloride	0.9100	0.15	1	0	91.0	70	130				

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UG-040213	SampType: LCS	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6816
Client ID: ZZZZZ	Batch ID: R6816	TestNo: TO-15		Analysis Date: 4/2/2013	SeqNo: 80496

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.150	0.15	1	0	115	70	130				
1,1,2-Trichloroethane	1.170	0.15	1	0	117	70	130				
1,1-Dichloroethane	0.9000	0.15	1	0	90.0	70	130				
1,1-Dichloroethene	1.060	0.15	1	0	106	70	130				
1,2,4-Trichlorobenzene	0.8900	0.15	1	0	89.0	70	130				
1,2,4-Trimethylbenzene	0.7500	0.15	1	0	75.0	70	130				
1,2-Dichloroethane	0.9700	0.15	1	0	97.0	70	130				
1,3,5-Trimethylbenzene	0.8700	0.15	1	0	87.0	70	130				
Benzene	1.110	0.15	1	0	111	70	130				
Carbon tetrachloride	1.110	0.15	1	0	111	70	130				
Chloroform	0.9900	0.15	1	0	99.0	70	130				
cis-1,2-Dichloroethene	0.9000	0.15	1	0	90.0	70	130				
Ethylbenzene	0.8900	0.15	1	0	89.0	70	130				
Freon 12	1.020	0.15	1	0	102	70	130				
m&p-Xylene	1.910	0.30	2	0	95.5	70	130				
Methyl tert-butyl ether	0.9300	0.15	1	0	93.0	70	130				
Methylene chloride	1.040	0.15	1	0	104	70	130				
o-Xylene	0.9400	0.15	1	0	94.0	70	130				
Tetrachloroethylene	0.8900	0.15	1	0	89.0	70	130				
Toluene	0.9400	0.15	1	0	94.0	70	130				
trans-1,2-Dichloroethene	1.020	0.15	1	0	102	70	130				
Trichloroethene	1.030	0.15	1	0	103	70	130				
Vinyl chloride	0.9600	0.15	1	0	96.0	70	130				

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CENTEK LABORATORIES, LLC

Date: *18-Apr-13*

ANALYTICAL QC SUMMARY REPORT

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Sample ID ALCS1UGD-040213	SampType: LCSD	TestCode: 1ugM3_FullLi	Units: ppbV	Prep Date:	RunNo: 6816
Client ID: ZZZZZ	Batch ID: R6816	TestNo: TO-15		Analysis Date: 4/3/2013	SeqNo: 80497

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	1.170	0.15	1	0	117	70	130	1.15	1.72	30	
1,1,2-Trichloroethane	1.170	0.15	1	0	117	70	130	1.17	0	30	
1,1-Dichloroethane	0.9200	0.15	1	0	92.0	70	130	0.9	2.20	30	
1,1-Dichloroethene	1.080	0.15	1	0	108	70	130	1.06	1.87	30	
1,2,4-Trichlorobenzene	0.7900	0.15	1	0	79.0	70	130	0.89	11.9	30	
1,2,4-Trimethylbenzene	0.7700	0.15	1	0	77.0	70	130	0.75	2.63	30	
1,2-Dichloroethane	0.9700	0.15	1	0	97.0	70	130	0.97	0	30	
1,3,5-Trimethylbenzene	0.9100	0.15	1	0	91.0	70	130	0.87	4.49	30	
Benzene	1.120	0.15	1	0	112	70	130	1.11	0.897	30	
Carbon tetrachloride	1.120	0.15	1	0	112	70	130	1.11	0.897	30	
Chloroform	0.9900	0.15	1	0	99.0	70	130	0.99	0	30	
cis-1,2-Dichloroethene	0.9000	0.15	1	0	90.0	70	130	0.9	0	30	
Ethylbenzene	0.9100	0.15	1	0	91.0	70	130	0.89	2.22	30	
Freon 12	1.070	0.15	1	0	107	70	130	1.02	4.78	30	
m&p-Xylene	1.900	0.30	2	0	95.0	70	130	1.91	0.525	30	
Methyl tert-butyl ether	0.9500	0.15	1	0	95.0	70	130	0.93	2.13	30	
Methylene chloride	1.080	0.15	1	0	108	70	130	1.04	3.77	30	
o-Xylene	0.9500	0.15	1	0	95.0	70	130	0.94	1.06	30	
Tetrachloroethylene	0.9300	0.15	1	0	93.0	70	130	0.89	4.40	30	
Toluene	0.9600	0.15	1	0	96.0	70	130	0.94	2.11	30	
trans-1,2-Dichloroethene	1.050	0.15	1	0	105	70	130	1.02	2.90	30	
Trichloroethene	1.070	0.15	1	0	107	70	130	1.03	3.81	30	
Vinyl chloride	1.020	0.15	1	0	102	70	130	0.96	6.06	30	

Qualifiers:

.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits				

CLIENT: Tetra Tech, Inc.
Work Order: C1304005
Project: Middle River

TestCode: 1ugM3_FullList

Qualifiers:	.	Results reported are not blank corrected	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected at or below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
	S	Spike Recovery outside accepted recovery limits				

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT: Middle River and Tilley Chemical		JOB NUMBER SDG C1304005	
SUBJECT: Sample Calculations			
BASED ON		DRAWING NUMBER	
BY: Ann Cognetta	CHECKED BY	APPROVED BY 5-8-13 JAI	DATE April 24, 2013

Sample IA-15-A-14A; toluene

$$\frac{125946}{75026} * 10 * \frac{1\ ppbv}{0.648} = 2591\ ppbv$$

$$25.91\ ppbv * \frac{92.14\ g/mole}{24.45\ l/mole} = 97.634\ g/m^3$$ ✓

Sample Calculation

Centek Laboratories, LLC

Date: *18-Apr-13*
IA-15-A-14A

CLIENT:	Tetra Tech, Inc.	**Client Sample ID:**	~~1A-05-A-14A~~ AC
Lab Order:	C1304005	**Tag Number:**	556,299
Project:	Middle River	**Collection Date:**	3/28/2013
Lab ID:	C1304005-001A	**Matrix:**	AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 W/ADDITIONAL CMPDS BY METHOD TO1		**TO-15**				**Analyst: RJP**
1,1,1-Trichloroethane	< 0.83	0.83		ug/m3	1	4/1/2013 5:47:00 PM
1,1,2-Trichloroethane	< 0.83	0.83		ug/m3	1	4/1/2013 5:47:00 PM
1,1-Dichloroethane	< 0.62	0.62		ug/m3	1	4/1/2013 5:47:00 PM
1,1-Dichloroethene	< 0.60	0.60		ug/m3	1	4/1/2013 5:47:00 PM
1,2,3-Trimethylbenzene	< 0.75	0.75		ug/m3	1	4/1/2013 5:47:00 PM
1,2,4-Trichlorobenzene	< 1.1	1.1		ug/m3	1	4/1/2013 5:47:00 PM
1,2,4-Trimethylbenzene	0.85	0.75		ug/m3	1	4/1/2013 5:47:00 PM
1,2-Dichloroethane	< 0.62	0.62		ug/m3	1	4/1/2013 5:47:00 PM
1,3,5-Trimethylbenzene	< 0.75	0.75		ug/m3	1	4/1/2013 5:47:00 PM
Benzene	1.1	0.49		ug/m3	1	4/1/2013 5:47:00 PM
Carbon tetrachloride	< 0.96	0.96		ug/m3	1	4/1/2013 5:47:00 PM
Chloroform	< 0.74	0.74		ug/m3	1	4/1/2013 5:47:00 PM
cis-1,2-Dichloroethene	0.48	0.60	J	ug/m3	1	4/1/2013 5:47:00 PM
Ethylbenzene	4.4	0.66		ug/m3	1	4/1/2013 5:47:00 PM
Freon 12	2.4	0.75		ug/m3	1	4/1/2013 5:47:00 PM
Freon 22	1.2	0.54		ug/m3	1	4/1/2013 5:47:00 PM
m&p-Xylene	17	13		ug/m3	10	4/2/2013 4:03:00 PM
Methyl tert-butyl ether	< 0.55	0.55		ug/m3	1	4/1/2013 5:47:00 PM
Methylene chloride	24	5.3		ug/m3	10	4/2/2013 4:03:00 PM
Naphthalene	< 0.80	0.80		ug/m3	1	4/1/2013 5:47:00 PM
o-Xylene	8.7	0.66		ug/m3	1	4/1/2013 5:47:00 PM
Tetrachloroethylene	< 1.0	1.0		ug/m3	1	4/1/2013 5:47:00 PM
Toluene	99	5.7		ug/m3	10	4/2/2013 4:03:00 PM
trans-1,2-Dichloroethene	< 0.60	0.60		ug/m3	1	4/1/2013 5:47:00 PM
Trichloroethene	1.8	0.82		ug/m3	1	4/1/2013 5:47:00 PM
Vinyl chloride	< 0.39	0.39		ug/m3	1	4/1/2013 5:47:00 PM

Qualifiers:

**	Reporting Limit	.	Results reported are not blank corrected
B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected at or below quantitation limits
JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC Quantitation Report (QT Reviewed) Sample Calculation

Data File : C:\HPCHEM\1\DATA\AK040205.D Vial: 1
Acq On : 2 Apr 2013 4:03 pm Operator: RJP
Sample : C1304005-001A 10x Inst : MSD #1
Misc : A313_UGM3 IA-15-A-14A Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 03 11:38:24 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.47	128	27468	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.76	114	76530	1.00	ppb	0.00
49) Chlorobenzene-d5	16.17	117	75026	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	35984	0.84	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 84.00%			
Target Compounds						Qvalue
20) Methylene chloride	6.78	84	18332	0.69	ppb	98
50) Toluene	14.35	92	125946	2.59	ppb	97
58) m&p-xylene	16.62	91	32233m	0.38	ppb	

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK040205.D A313_1UG.M Thu Apr 18 09:57:33 2013 MSD1 Page 1

Sample Calculation

Response Factor Report MSD #1

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Wed Mar 27 15:03:05 2013
Response via : Initial Calibration

Calibration Files
0.04 =AK031318.D 0.10 =AK031320.D 0.15 =AK031321.D
0.30 =AK031323.D 0.50 =AK031324.D 0.75 =AK031325.D

		Compound	0.04	0.10	0.15	0.30	0.50	0.75	Avg	%RSD
1)	I	Bromochloromethane	----------ISTD----------							
2)	T	Freon 22			3.081	2.495	2.258	2.251	2.318	14.51
3)	T	Propylene			0.902	0.799	0.840	0.745	0.750	11.67
4)	T	Freon 12			6.430	5.238	4.955	4.831	4.997	12.39
5)	T	Chloromethane			1.576	1.477	1.232	1.226	1.260	14.29
6)	T	Freon 114			4.946	4.059	3.737	3.681	3.803	13.25
7)	T	Vinyl Chloride	1.539	1.228	1.254	1.180	1.065	1.076	1.130	15.65
8)	T	1,3-butadiene			0.931	0.818	0.703	0.790	0.796	11.00
9)	T	Bromomethane			1.682	1.356	1.335	1.286	1.314	12.22
10)	T	Ethanol				0.297	0.301	0.267	0.267	11.24
11)	T	Acrolein			0.348	0.266	0.253	0.316	0.268	15.80
12)	T	Chloroethane			0.598	0.607	0.515	0.503	0.507	12.58
13)	T	Vinyl Bromide			1.779	1.426	1.436	1.387	1.388	12.57
14)	T	Freon 11			7.033	5.436	5.167	5.090	5.257	14.29
15)	T	Acetone				0.494	0.434	0.464	0.435	8.75
16)	T	Isopropyl alcoh			1.606	1.386	1.334	1.364	1.284	13.47
17)	T	1,1-dichloroeth			1.403	1.317	1.136	1.106	1.151	11.64
18)	T	Freon 113			3.698	2.902	2.731	2.739	2.759	14.84
19)	t	t-Butyl alcohol			2.837	2.073	2.026	1.999	2.053	16.43
20)	T	Methylene chlor			1.210	1.099	0.999	0.939	0.968	13.24
21)	T	Allyl chloride			1.877	1.966	1.500	1.482	1.546	15.52
22)	T	Carbon disulfid			4.597	3.489	3.093	3.120	3.221	18.55
23)	T	trans-1,2-dichl			2.028	1.600	1.480	1.589	1.584	11.75
24)	T	methyl tert-but			3.872	3.220	2.988	2.808	3.063	11.56
25)	T	1,1-dichloroeth			3.052	2.440	2.194	2.322	2.323	13.53
26)	T	Vinyl acetate			2.495	1.506	1.629	1.914	1.790	17.55
27)	T	Methyl Ethyl Ke				0.366	0.396	0.398	0.379	4.47
28)	T	cis-1,2-dichlor			1.896	1.355	1.459	1.335	1.439	13.09
29)	T	Hexane			1.592	1.227	1.174	1.282	1.268	10.97
30)	T	Ethyl acetate			2.170	1.847	1.715	1.754	1.802	8.91
31)	T	Chloroform			4.440	3.414	3.311	3.200	3.318	14.33
32)	T	Tetrahydrofuran			0.952	0.885	0.776	0.747	0.780	11.53
33)	T	1,2-dichloroeth			2.949	2.320	2.209	2.204	2.258	12.92
34)	I	1,4-difluorobenzene	----------ISTD----------							
35)	T	1,1,1-trichloro			1.691	1.197	1.110	1.124	1.155	19.49
36)	T	Cyclohexane			0.454	0.362	0.344	0.347	0.364	10.62
37)	T	Carbon tetrachl	2.306	1.702	1.954	1.379	1.339	1.321	1.492	25.15
38)	T	Benzene			1.169	0.940	0.930	0.890	0.910	12.50
39)	T	Methyl methacry			0.372	0.258	0.260	0.273	0.277	14.13
40)	T	1,4-dioxane				0.129	0.111	0.112	0.113	6.79
41)	T	2,2,4-trimethyl			1.581	1.160	1.122	1.111	1.175	14.30
42)	T	Heptane			0.557	0.386	0.375	0.349	0.389	17.92
43)	T	Trichloroethene	0.771	0.585	0.694	0.512	0.490	0.476	0.541	20.17
44)	T	1,2-dichloropro			0.469	0.354	0.351	0.341	0.350	14.45
45)	T	Bromodichlorome			1.483	1.087	1.074	1.029	1.076	15.84
46)	T	cis-1,3-dichlor			0.661	0.457	0.457	0.467	0.482	15.14
47)	T	trans-1,3-dichl			0.564	0.407	0.452	0.422	0.455	10.95
48)	T	1,1,2-trichloro			0.657	0.492	0.488	0.454	0.485	14.88
49)	I	Chlorobenzene-d5	----------ISTD----------							
50)	T	Toluene			0.844	0.608	0.629	0.623	0.648	12.47
51)	T	Methyl Isobutyl				0.475	0.458	0.455	0.432	8.76

(#) = Out of Range ### Number of calibration levels exceeded format ###

GC/MS VOLATILES-WHOLE AIR

METHOD TO-15

CANISTER CLEANING LOG

Centek Laboratories, LLC

QC Canister Cleaning Logbook

Instrument: Entech 3100

Canister Number	QC Can Number	Number of Cycles	Date	QC Batch Number	Detection Limits	Leak Test 24hr (psig str/stp)	
562		30	3.19.13	WAC031913 A	1ug/m3±0.25 100%	+ 30	+ 20
1210				B		+	+
410				C		+	+
93				D		+	+
142				E		+	+
1193				F		+	+
821	840			WAC031913 H	1ug/m3±0.25	+	+
860						+	+
855						+	+
823						+	+
827						+	+
840						+	+
237	94			WAC031913 I		+	+
1186						+	+
233						+	+
163						+	+
94						+	+
463	236			WAC031913 J		+	+
1191						+	+
3241						+	+
129						+	+
236						+	+
						+	+
						+	+
						+	+

Cleaned by: _____

Page # 144

Instrument: Entech 3100

Canister Number	QC Can Number	Number of Cycles	Date	QC Batch Number	Detection Limits	Leak Test 24hr (psig str/stp)	
464	466	30	3.19.13	WAC031913 K	1ug/m3+0.25	+ 30	+ 30
351						+	+
1192						+	+
318						+	+
466						+	+
495	229			WAC031913 L		+	+
240						+	+
431						+	+
320						+	+
229						+	+
493	552			WAC031913 M		+	+
318						+	+
1175						+	+
354						+	+
552						+	+
1173	364			WAC031913 N		+	+
245						+	+
554						+	+
544						+	+
364						+	+
133	283			WAC031913O		+	+
360						+	+
131						+	+
138						+	+
283						+	+

Cleaned by: _____

Page # 145

Centek Laboratories, LLC

QC Canister Cleaning Logbook

Instrument: Entech 3100

Canister Number	QC Can Number	Number of Cycles	Date	QC Batch Number	Detection Limits	Leak Test 24hr (psig str/stp)	
1183	556	30	3.19.13	WAC031913P	1ug/m3+0.25	+30	+30
558						+	+
429						+	+
367						+	+
556						+	+
1174	357			WAC031913Q		+	+
98						+	+
571						+	+
542						+	+
359						+	+
211	1197			WAC031913R		+	+
1205						+	+
218						+	+
484						+	+
1197						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+
						+	+

Cleaned by: _____

Page # 146

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031917.D Vial: 11
Acq On : 19 Mar 2013 6:56 pm Operator: RJP
Sample : WAC031913K Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:07 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

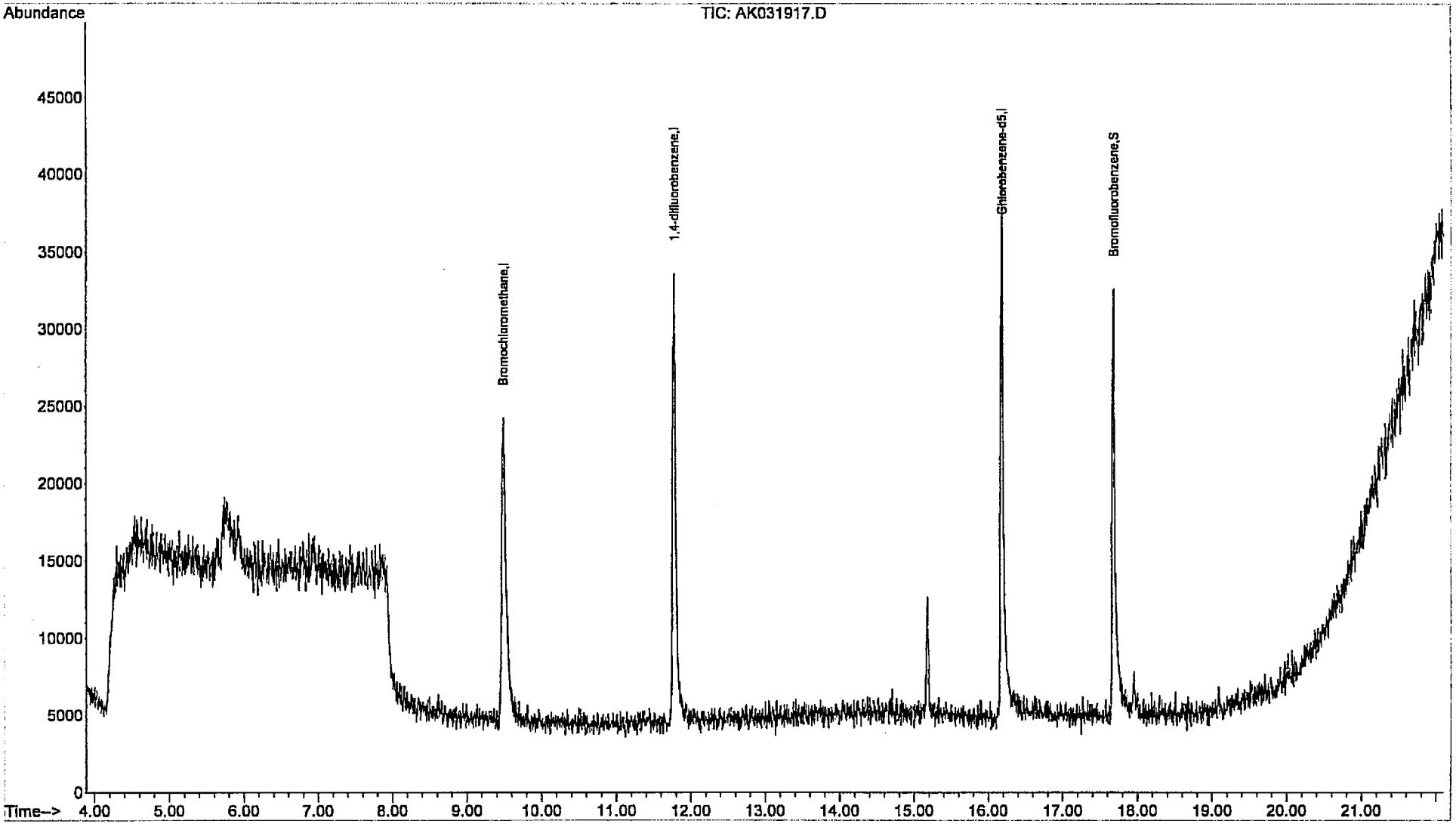
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11759	1.00	ppb	0.02
34) 1,4-difluorobenzene	11.77	114	36585	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31646	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	14287	0.79	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 79.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031917.D A313_1UG.M Thu Apr 18 10:39:40 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031917.D Vial: 11
Acq On : 19 Mar 2013 6:56 pm Operator: RJP
Sample : WAC031913K Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031918.D Vial: 12
Acq On : 19 Mar 2013 7:29 pm Operator: RJP
Sample : WAC031913L Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:08 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

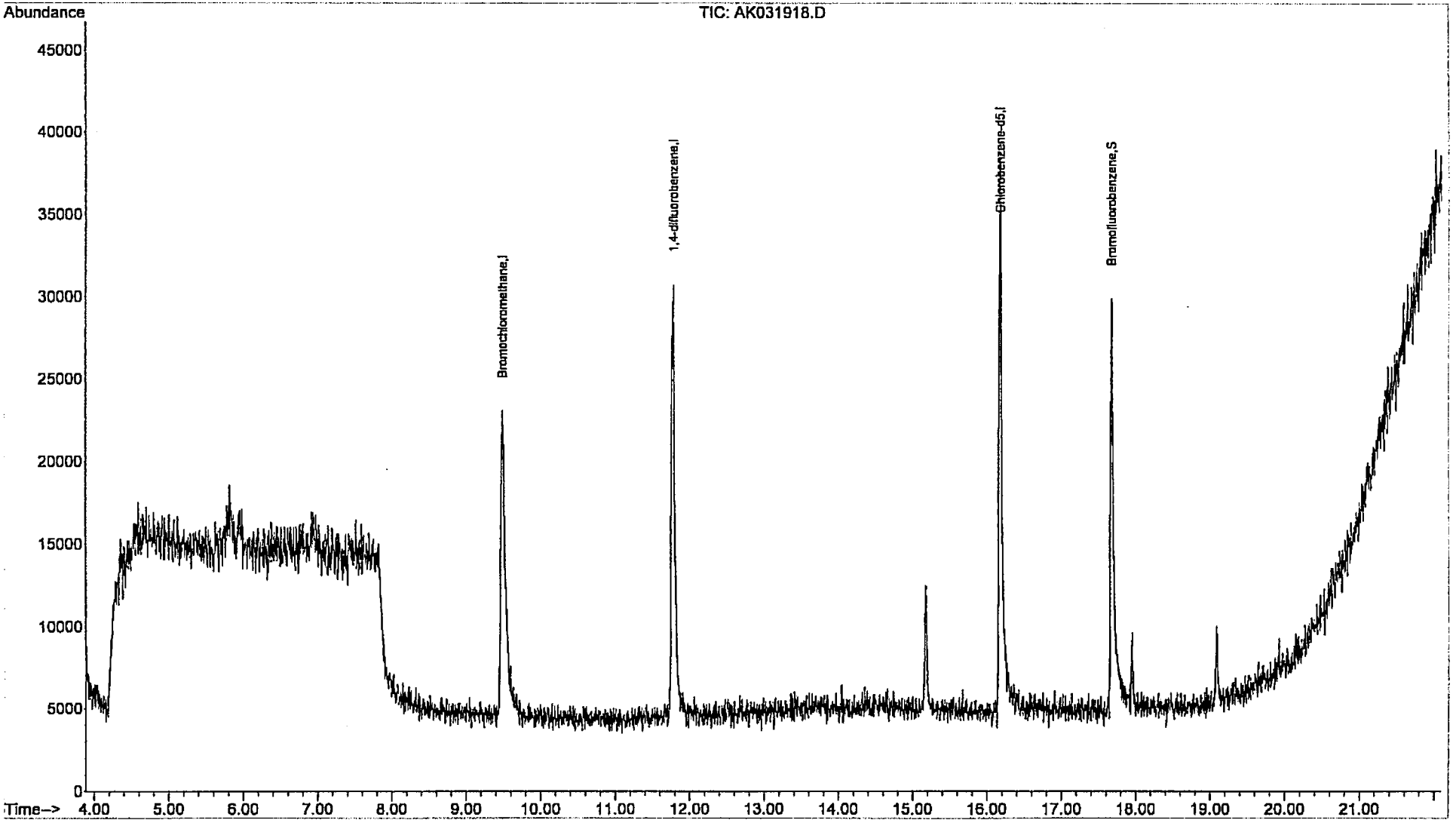
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11111	1.00	ppb	0.02
34) 1,4-difluorobenzene	11.78	114	34796	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31964	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	13168	0.72	ppb	0.01
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031918.D Vial: 12
Acq On : 19 Mar 2013 7:29 pm Operator: RJP
Sample : WAC031913L Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031919.D Vial: 13
Acq On : 19 Mar 2013 8:03 pm Operator: RJP
Sample : WAC031913M Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:09 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

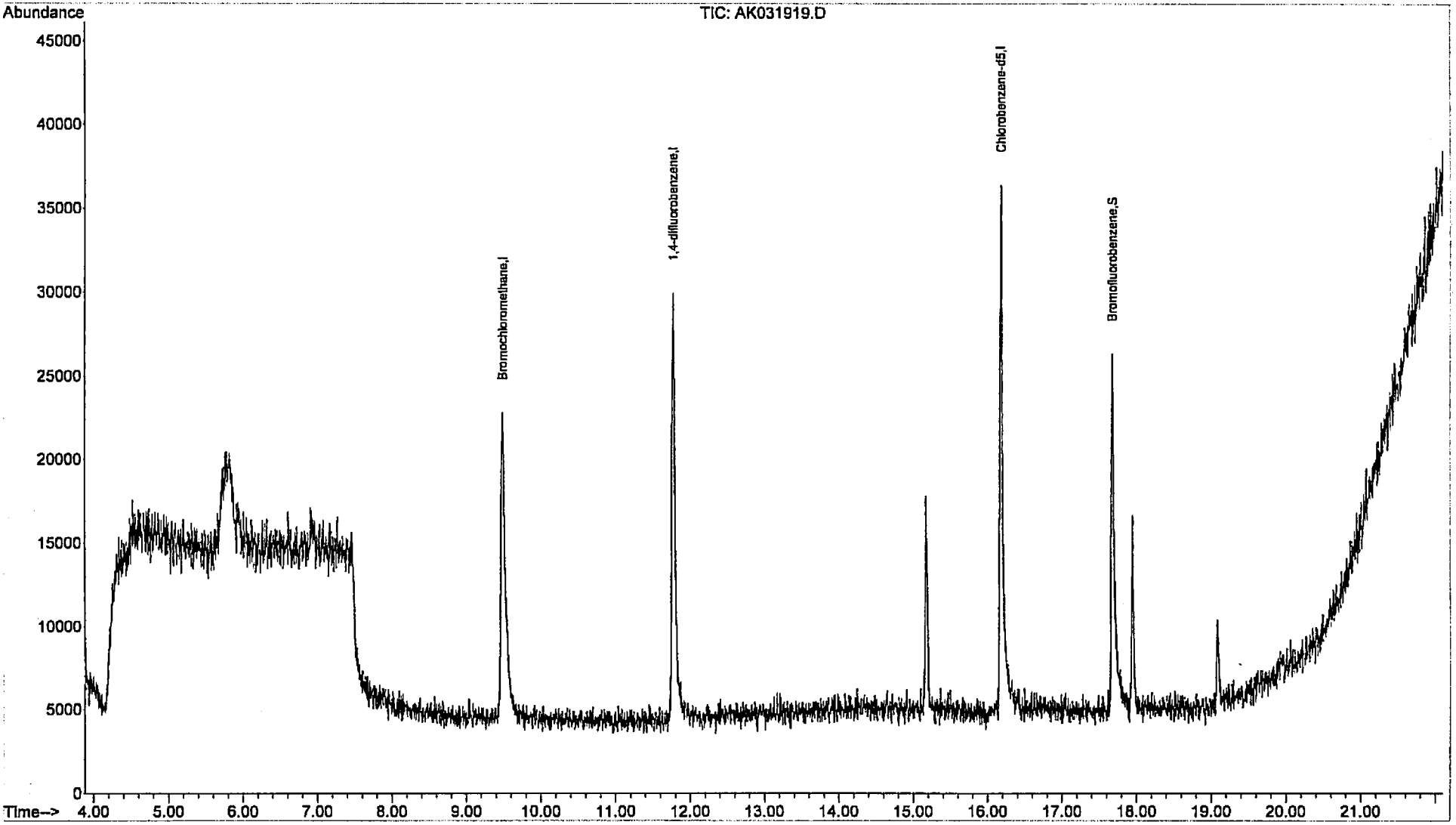
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11266	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	33083	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	29053	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	11984	0.72	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031919.D Vial: 13
Acq On : 19 Mar 2013 8:03 pm Operator: RJP
Sample : WAC031913M Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:08 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



AK031919.D A313_1UG.M Thu Apr 18 10:39:45 2013 MSD1 Page 2

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031920.D Vial: 14
Acq On : 19 Mar 2013 8:36 pm Operator: RJP
Sample : WAC031913N Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:10 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

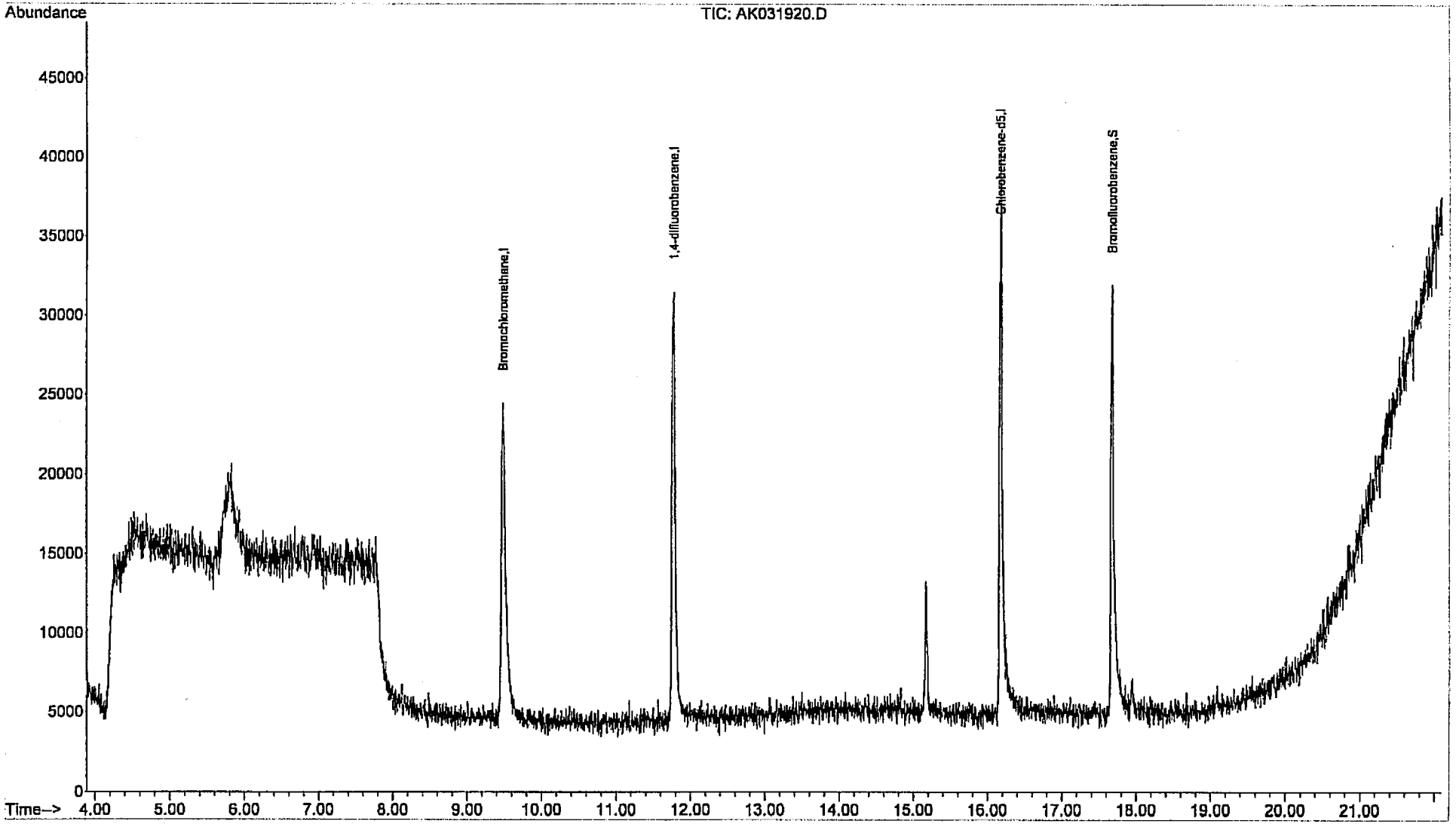
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11684	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	35873	1.00	ppb	0.01
49) Chlorobenzene-d5	16.18	117	32390	1.00	ppb	0.01
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	14021	0.76	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 76.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031920.D A313_1UG.M Thu Apr 18 10:39:46 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031920.D Vial: 14
Acq On : 19 Mar 2013 8:36 pm Operator: RJP
Sample : WAC031913N Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 6:45 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031921.D Vial: 15
Acq On : 19 Mar 2013 9:09 pm Operator: RJP
Sample : WAC031913O Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:11 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

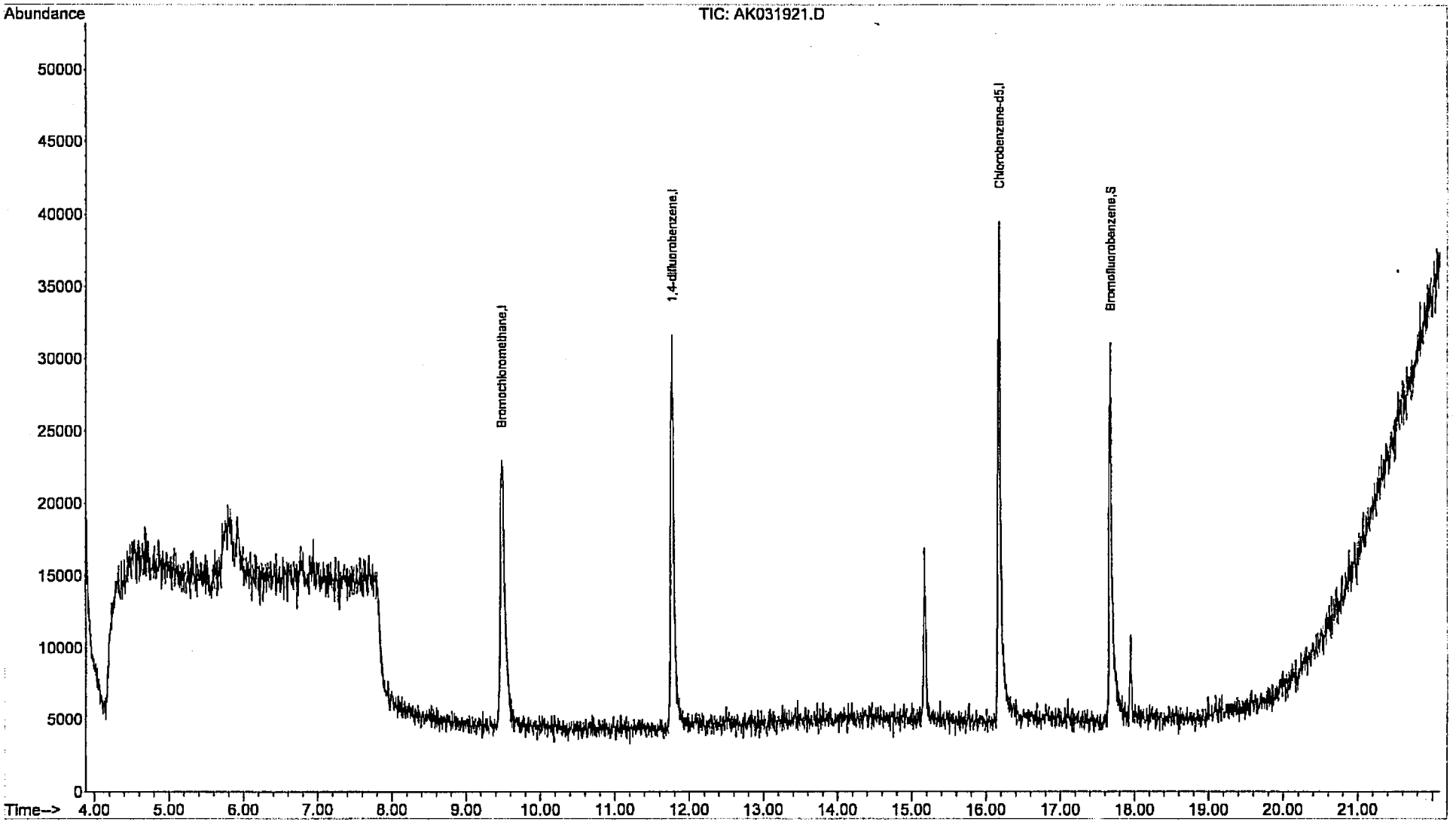
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11588	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	33952	1.00	ppb	0.02
49) Chlorobenzene-d5	16.17	117	30767	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	13040	0.74	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 74.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031921.D Vial: 15
Acq On : 19 Mar 2013 9:09 pm Operator: RJP
Sample : WAC031913O Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031922.D Vial: 16
Acq On : 19 Mar 2013 9:42 pm Operator: RJP
Sample : WAC031913P Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:12 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

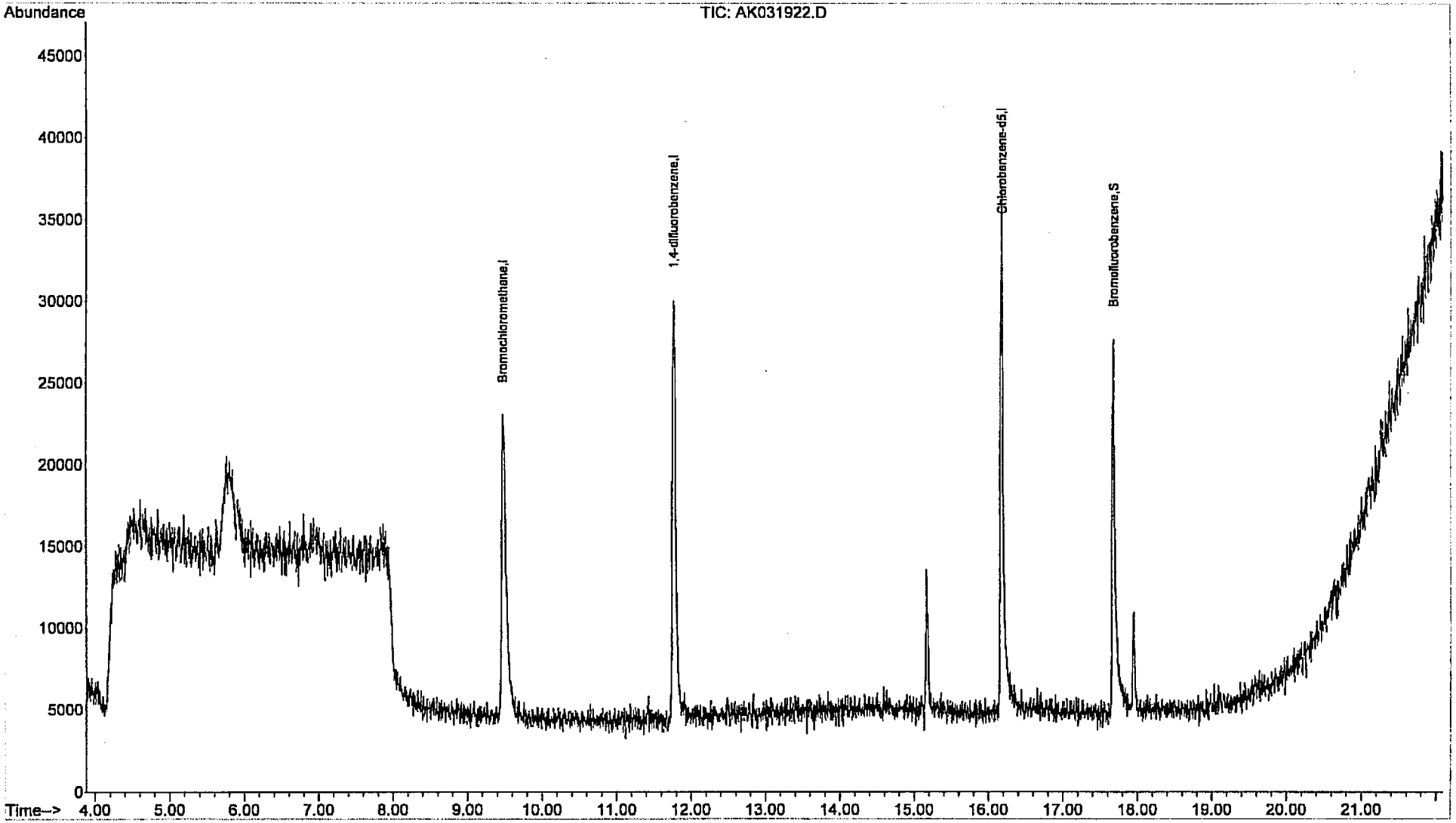
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.48	128	11290	1.00	ppb	0.00
34) 1,4-difluorobenzene	11.77	114	33532	1.00	ppb	0.01
49) Chlorobenzene-d5	16.18	117	29066	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.67	95	12001	0.72	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 72.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031922.D A313_1UG.M Thu Apr 18 10:39:50 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031922.D Vial: 16
Acq On : 19 Mar 2013 9:42 pm Operator: RJP
Sample : WAC031913P Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031923.D Vial: 17
Acq On : 19 Mar 2013 10:15 pm Operator: RJP
Sample : WAC031913Q Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:13 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_T015

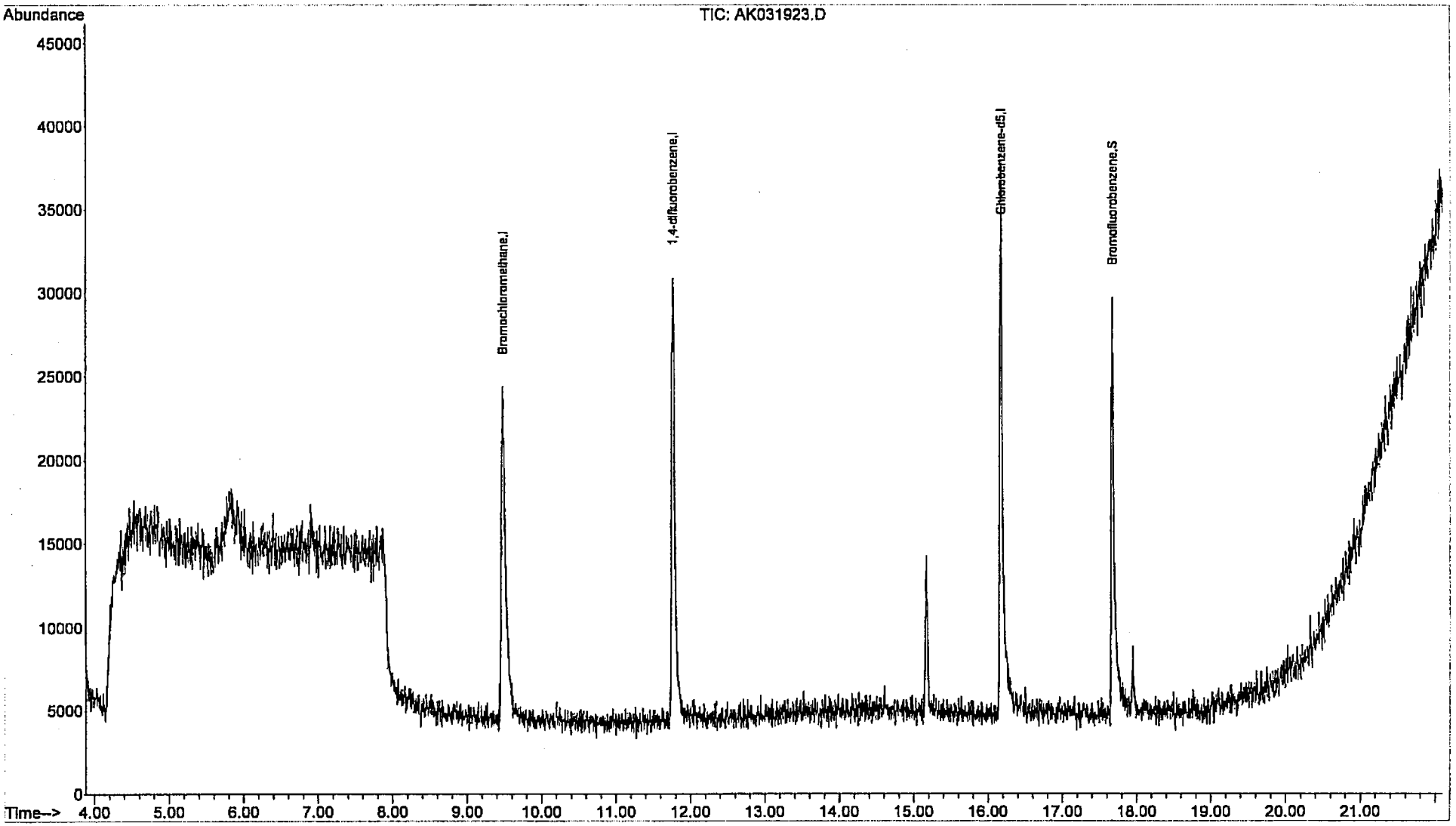
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11192	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	34366	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	30569	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	12478	0.71	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 71.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031923.D Vial: 17
Acq On : 19 Mar 2013 10:15 pm Operator: RJP
Sample : WAC031913Q Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031924.D Vial: 18
Acq On : 19 Mar 2013 10:48 pm Operator: RJP
Sample : WAC031913R Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 20 06:45:14 2013 Quant Results File: A313_1UG.RES

Quant Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Mar 14 09:00:09 2013
Response via : Initial Calibration
DataAcq Meth : 1UG_TO15

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	9.49	128	11104	1.00	ppb	0.01
34) 1,4-difluorobenzene	11.77	114	34151	1.00	ppb	0.02
49) Chlorobenzene-d5	16.18	117	31381	1.00	ppb	0.00
System Monitoring Compounds						
62) Bromofluorobenzene	17.68	95	13124	0.73	ppb	0.00
Spiked Amount 1.000	Range 70 - 130		Recovery = 73.00%			
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed
AK031924.D A313_1UG.M Thu Apr 18 10:39:54 2013 MSD1 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA2\AK031924.D Vial: 18
Acq On : 19 Mar 2013 10:48 pm Operator: RJP
Sample : WAC031913R Inst : MSD #1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 16 11:09 2013 Quant Results File: A313_1UG.RES

Method : C:\HPCHEM\1\METHODS\A313_1UG.M (RTE Integrator)
Title : TO-15 VOA Standards for 5 point calibration
Last Update : Thu Apr 18 09:56:14 2013
Response via : Initial Calibration