PERFORMANCE EVALUATION

Scheduled Study

QT-0005815

08-Dec-2016 Through 01-Jan-2017

49670108
RTC Labcode

MT00945
EPA Labcode

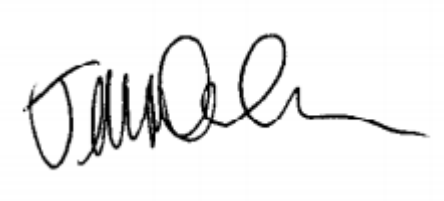
Participating Laboratory:

Energy Laboratories-Helena
Jon Hager
E 3161 Lyndale Avenue
Helena MT 59601 US

Thank you for participating in study QT-0005815. Additional information about this study may be found online at www.sigmaaldrich.com/pt.

Sigma-Aldrich RTC Inc.
2931 Soldier Springs Road
Laramie, WY 82070 USA
1-307-742-5452
www.sigmaaldrich.com

Sincerely,



Jennifer Duhon
Proficiency Testing Supervisor

Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

Accredating Labcode
EPA Region 8

Marcie Tidd
Waste Water/Drinking Water Certification
1595 Wynkoop Street
Denver CO 80202-1129 US

Accredating Labcode
Montana Dept. of Public Health & Human Services

Russell Leu
PO Box 4369
Helena MT 59604-4369 US

RTC is accrediated to perform PT programs for the scope of accredation to ISO/IEC 17043 under ANAB certificate AP-1469

Nutrients

Method:EPA 300.0 2.1 (1993) [10053200]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Orthophosphate as P [1,2] 1870 / PE1364-20ML - Lot LRAB1305 /Analyst:SW/ Analysis Date: 2016-12-14	1.7 mg/L *Evaluation Criteria - 8* ☒*Voluntary*	2	1.7 to 2.3	-2 *Evaluation Parameter - a:1, b:0, c:0.075, d:0*	Acceptable

Method:EPA 353.2 2 (1993) [10067604]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Nitrite as N [1,2] 1840 / PE1364-20ML - Lot LRAB1305 /Analyst:CM/ Analysis Date: 2016-12-15	1.10 mg/L *Evaluation Criteria - 8* ☐*Voluntary*	1.02	0.87 to 1.17	1.05 *Evaluation Parameter - a:1, b:0, c:0.075, d:0*	Acceptable

Method:EPA 365.1 2 (1993) [10070005]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Orthophosphate as P [1,2] 1870 / PE1364-20ML - Lot LRAB1305 /Analyst:CM/ Analysis Date: 2016-12-21	1.93 mg/L *Evaluation Criteria - 8* ☐*Voluntary*	2	1.7 to 2.3	-0.47 *Evaluation Parameter - a:1, b:0, c:0.075, d:0*	Acceptable

Trace Metals - Drinking Water

Method:EPA 200.8 5.4 (1994) [10014605]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Chromium, Cr (total) [1,2]	80 ug/L	91.6	77.9 to 105	-1.69	Acceptable
1040 / PE3488-500ML - Lot LRAB3517 /Analyst:DK/ Analysis Date: 2016-12-27	*Evaluation Criteria - 8* ☐*Voluntary*			*Evaluation Parameter - a:1, b:0, c:0.075, d:0*	

Volatile Organic Compounds(VOCs)

Method:EPA 524.2 4 (1992) [10089006]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
1,1,1,2-Tetrachloroethane [1,2] 5105 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	21 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	17.8	14.2 to 21.4	1.8 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) [10088809]

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Benzene [1,2] 4375 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	10 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	9.94	5.96 to 13.9	0.03 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Bromobenzene [1,2] 4385 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	17 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	16.6	13.3 to 19.9	0.24 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Bromochloromethane [1,2] 4390 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L *Evaluation Criteria - 4* ☐*Voluntary*	0	0 to 0	0 *Evaluation Parameter - break:10, highPercentage:0.20, lowPercentage:0.40*	Acceptable
n-Butylbenzene [1,2] 4435 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	13 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	11.6	9.28 to 13.9	1.21 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
sec-Butylbenzene [1,2] 4440 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.2 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	4.53	2.72 to 6.34	0.74 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
tert-Butylbenzene [1,2] 4445 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.6 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	5.48	3.29 to 7.67	0.11 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Carbon tetrachloride [1,2]	<1 ug/L	0	0 to 0	0	Acceptable

4455 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	*Evaluation Criteria - 4* ☐*Voluntary*				*Evaluation Parameter - break:10, highPercentage:0.20, lowPercentage:0.40*
Chlorobenzene [1,2]	12 ug/L	12.3	9.84 to 14.8	-0.24	Acceptable
4475 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	*Evaluation Criteria - 8* ☐*Voluntary*				*Evaluation Parameter - a:1, b:0, c:0.1, d:0*
Chloroethane [1,2]	<1 ug/L	37.6	22.6 to 52.6	-5	Not Acceptable
4485 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	*Evaluation Criteria - 8* ☐*Voluntary*				*Evaluation Parameter - a:1, b:0, c:0.20, d:0*

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
2-Chlorotoluene [1,2] 4535 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	6.5 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	6.12	3.67 to 8.57	0.31 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
4-Chlorotoluene [1,2] 4540 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	3.6 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	3.93	2.36 to 5.5	-0.42 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Dibromomethane [1,2] 4595 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.7 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	5.9	3.54 to 8.26	-0.17 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,2-Dichlorobenzene [1,2] 4610 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.4 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	5.17	3.1 to 7.24	0.22 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,3-Dichlorobenzene [1,2] 4615 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	15 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	15	12 to 18	0 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,4-Dichlorobenzene [1,2] 4620 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	16 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	16.8	13.4 to 20.2	-0.48 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Dichlorodifluoromethane [1,2] 4625 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	0	0 to 0	0 *Evaluation Parameter - a:1, b:0, c:0.20, d:0*	Acceptable
1,1-Dichloroethane [1,2] 4630 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	4.6 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	4.74	2.84 to 6.64	-0.15 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,2-Dichloroethane [1,2] 4635 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	13 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	13.8	11 to 16.6	-0.58 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
1,1-Dichloroethylene [1,2] 4640 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	12 ug/L	13 *Evaluation Criteria - 8* ☐ *Voluntary*	10.4 to 15.6	-0.77 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
cis-1,2-Dichloroethylene [1,2] 4645 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	16 ug/L	14.4 *Evaluation Criteria - 8* ☐ *Voluntary*	11.5 to 17.3	1.11 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,2-Dichloropropane [1,2] 4655 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	16 ug/L	14.5 *Evaluation Criteria - 8* ☐ *Voluntary*	11.6 to 17.4	1.03 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,3-Dichloropropane [1,2] 4660 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L	13.4 *Evaluation Criteria - 8* ☐ *Voluntary*	10.7 to 16.1	0.45 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
2,2-Dichloropropane [1,2] 4665 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	6.2 ug/L	5.89 *Evaluation Criteria - 8* ☐ *Voluntary*	3.53 to 8.25	0.26 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,1-Dichloropropene [1,2] 4670 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	17 ug/L	16.1 *Evaluation Criteria - 8* ☐ *Voluntary*	12.9 to 19.3	0.56 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
cis-1,3-Dichloropropene [1,2] 4680 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	6.9 ug/L	7.17 *Evaluation Criteria - 8* ☐ *Voluntary*	4.3 to 10	-0.19 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
trans-1,3-Dichloropropene [1,2] 4685 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	9.3 ug/L	9.55 *Evaluation Criteria - 8* ☐ *Voluntary*	5.73 to 13.4	-0.13 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
trans-1,2-Dichloroethylene [1,2] 4700 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L	13.3 *Evaluation Criteria - 8* ☐ *Voluntary*	10.6 to 16	0.53 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Ethylbenzene [1,2] 4765 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L	13.9 *Evaluation Criteria - 8* ☐ *Voluntary*	11.1 to 16.7	0.07 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Hexachlorobutadiene [1,2] 4835 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	45 ug/L	39 *Evaluation Criteria - 8* ☐ *Voluntary*	31.2 to 46.8	1.54 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Isopropylbenzene [1,2] 4900 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	17 ug/L	16.9 *Evaluation Criteria - 8* ☐ *Voluntary*	13.5 to 20.3	0.06 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
4-Isopropyltoluene [1,2] 4910 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	9.4 ug/L	9.2 *Evaluation Criteria - 8* ☐ *Voluntary*	5.52 to 12.9	0.11 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Methyl bromide (Bromomethane) [1,2] 4950 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L	0 *Evaluation Criteria - 8* ☐ *Voluntary*	0 to 0	0 *Evaluation Parameter - a:1, b:0, c:0.20, d:0*	Acceptable
Methyl chloride (Chloromethane) [1,2] 4960 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L	0 *Evaluation Criteria - 8* ☐ *Voluntary*	0 to 0	0 *Evaluation Parameter - a:1, b:0, c:0.20, d:0*	Acceptable
Methylene chloride (Dichloromethane) [1,2] 4975 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	9.5 ug/L	9.7 *Evaluation Criteria - 8* ☐ *Voluntary*	5.82 to 13.6	-0.1 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Methyl tert-butyl ether (MTBE) [1,2] 5000 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	25 ug/L	26.9 *Evaluation Criteria - 8* ☐ *Voluntary*	21.5 to 32.3	-0.71 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Naphthalene [1,2] 5005 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L	12.3 *Evaluation Criteria - 8* ☐ *Voluntary*	9.84 to 14.8	1.38 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
n-Propylbenzene (1-Phenylpropane) [1,2] 5090 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.6 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	5.62	3.37 to 7.87	-0.02 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Styrene [1,2] 5100 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	13 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	12.4	9.92 to 14.9	0.48 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,1,2,2-Tetrachloroethane [1,2] 5110 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	3.8 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	3.85	2.31 to 5.39	-0.06 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Tetrachloroethylene (Perchloroethylene) [1,2] 5115 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	9.0 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	8.73	5.24 to 12.2	0.15 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Toluene [1,2] 5140 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	6.0 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	5.74	3.44 to 8.04	0.23 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,2,3-Trichlorobenzene [1,2] 5150 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	47 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	34.2	27.4 to 41	3.74 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Not Acceptable
1,2,4-Trichlorobenzene [1,2] 5155 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	5.2 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	6.1	3.66 to 8.54	-0.74 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
1,1,1-Trichloroethane [1,2] 5160 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L *Evaluation Criteria - 4* ☐ *Voluntary*	0	0 to 0	0 *Evaluation Parameter - break:10, highPercentage:0.20, lowPercentage:0.40*	Acceptable
1,1,2-Trichloroethane [1,2] 5165 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L *Evaluation Criteria - 8* ☐ *Voluntary*	13.2	10.6 to 15.8	0.61 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Trichloroethene (Trichloroethylene) [1,2] 5170 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	18 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	16.7	13.4 to 20	0.78 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
Trichlorofluoromethane [1,2] 5175 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	<1 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	0	0 to 0	0 *Evaluation Parameter - a:1, b:0, c:0.20, d:0*	Acceptable
1,2,3-Trichloropropane [1,2] 5180 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	16 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	14.7	11.8 to 17.6	0.88 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,2,4-Trimethylbenzene [1,2] 5210 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	13 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	13.3	10.6 to 16	-0.23 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable
1,3,5-Trimethylbenzene [1,2] 5215 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	4.5 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	4.06	2.44 to 5.68	0.54 *Evaluation Parameter - a:1, b:0, c:0.2, d:0*	Acceptable
Vinyl chloride [1,2] 5235 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	10 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	10.1	6.06 to 14.1	-0.05 *Evaluation Parameter - a:1, b:0, c:0.20, d:0*	Acceptable
m+p-Xylene [1,2] 5240 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	14 ug/L *Evaluation Criteria - 1* ☐*Voluntary*	14.2	7.81 to 20.6	-0.09 *Evaluation Parameter - a:1, b:0, c:0.15, d:0*	Acceptable
o-Xylene [1,2] 5250 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	19 ug/L *Evaluation Criteria - 1* ☐*Voluntary*	17.8	9.79 to 25.8	0.45 *Evaluation Parameter - a:1, b:0, c:0.15, d:0*	Acceptable
Xylene, total [1,2] 5260 / PE1358-1KT - Lot LRAB3339 /Analyst:KW/ Analysis Date: 2016-12-13	33 ug/L *Evaluation Criteria - 8* ☐*Voluntary*	32.1	25.7 to 38.5	0.28 *Evaluation Parameter - a:1, b:0, c:0.1, d:0*	Acceptable

Method:EPA 524.2 4.1 (1995) (Continued)

Analyte	Result	Units	Assigned Value	Accept. Window	Z	Evaluation

Group Analysis Summary

Acceptable : 53 / 55

Score : 96.36% - (Acceptable)

Sample Information

TRACE METALS - WS (WHOLE VOLUME) SAMPLE

PE3488-500ML / Lot LRAB3517

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Arsenic, As [1,2] 1010 Trace Metals - Drinking Water	ug/L	47.8±0.244	0	0
Beryllium, Be [1,2] 1020 Trace Metals - Drinking Water	ug/L	5.73±0.029	0	0
Cadmium, Cd [1,2] 1030 Trace Metals - Drinking Water	ug/L	11.0±0.056	0	0
Chromium, Cr (total) [1,2] 1040 Trace Metals - Drinking Water	ug/L	91.6±0.467	0	0
Copper, Cu [1,2] 1055 Trace Metals - Drinking Water	ug/L	920±4.69	0	0
Iron, Fe [1,2] 1070 Trace Metals - Drinking Water	ug/L	1415±7.22	0	0
Lead, Pb [1,2] 1075 Trace Metals - Drinking Water	ug/L	7.8±0.040	0	0
Manganese, Mn [1,2] 1090 Trace Metals - Drinking Water	ug/L	441±2.25	0	0
Mercury, Hg [1,2] 1095 Trace Metals - Drinking Water	ug/L	7.4±0.038	0	0
Nickel, Ni [1,2] 1105 Trace Metals - Drinking Water	ug/L	163±0.830	0	0
Selenium, Se [1,2] 1140 Trace Metals - Drinking Water	ug/L	35.2±0.180	0	0
Zinc, Zn [1,2] 1190 Trace Metals - Drinking Water	ug/L	1561±7.96	0	0
Aluminum, Al [1,2] 1000 Trace Metals - Drinking Water	ug/L	249±1.27	0	0

ANIONS - WS

PE1364-20ML / Lot LRAB1305

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Orthophosphate as PO4 [2] 11870	mg/L	6.26±0.032	0	0
Chloride [1,2] 1575	mg/L	41.4±0.211	0	0
Fluoride [1,2] 1730	mg/L	2.55±0.014	0	0
Nitrate as NO3 [1,2] 1805	mg/L	19.0±0.097	0	0
Nitrate as N [1,2] 1810	mg/L	4.29±0.022	0	0
Nitrate+nitrite as N [1,2] 1820	mg/L	5.32±0.027	0	0
Nitrite as NO2 [1,2] 1835	mg/L	3.36±0.017	0	0
Nitrite as N [1,2] 1840	mg/L	1.02±0.005	1.03	0.19
Orthophosphate as P [1,2] 1870	mg/L	2.04±0.010	0	0
Sulfate [1,2] 2000	mg/L	93.1±0.475	0	0
Orthophosphate as PO4 [2] 11870 Minerals	mg/L	6.26±0.032	0	0
Chloride [1,2] 1575 Minerals	mg/L	41.4±0.211	0	0
Fluoride [1,2] 1730 Minerals	mg/L	2.55±0.014	0	0
Nitrate as NO3 [1,2] 1805 Minerals	mg/L	19.0±0.097	0	0
Nitrate as N [1,2] 1810 Nutrients	mg/L	4.29±0.022	0	0
Nitrate+nitrite as N [1,2] 1820 Nutrients	mg/L	5.32±0.027	0	0
Nitrite as NO2 [1,2] 1835 Minerals	mg/L	3.36±0.017	0	0
Nitrite as N [1,2] 1840 Nutrients	mg/L	1.02±0.005	1.03	0.19
Orthophosphate as P [1,2] 1870 Nutrients	mg/L	2.04±0.010	0	0
Phosphorus as P, total [1,2] 1910 Miscellaneous Analytes	mg/L	2.04±0.010	0	0

Sulfate [1,2] 2000 Minerals	mg/L	93.1±0.475	0	0
Nitrate as N [1,2] 1810 Minerals	mg/L	4.29±0.022	0	0
Nitrate+nitrite as N [1,2] 1820 Minerals	mg/L	5.32±0.027	0	0
Nitrite as N [1,2] 1840 Minerals	mg/L	1.02±0.005	1.03	0.19
Orthophosphate as P [1,2] 1870 Minerals	mg/L	2.04±0.010	0	0
Sulfate [1,2] 2000 Miscellaneous Analytes	mg/L	93.1±0.475	0	0

Complete Volatiles Kit - WS

PE1358-1KT / Lot LRAB3339

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Benzene [1,2] 4375 Volatile Organic Compounds(VOCs)	ug/L	9.94±0.1	0	0
Bromobenzene [1,2] 4385 Volatile Organic Compounds(VOCs)	ug/L	16.6±0.161	0	0
Bromochloromethane [1,2] 4390 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
n-Butylbenzene [1,2] 4435 Volatile Organic Compounds(VOCs)	ug/L	11.6±0.113	0	0
sec-Butylbenzene [1,2] 4440 Volatile Organic Compounds(VOCs)	ug/L	4.53±0.044	0	0
tert-Butylbenzene [1,2] 4445 Volatile Organic Compounds(VOCs)	ug/L	5.48±0.053	0	0
Carbon tetrachloride [1,2] 4455 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
Chlorobenzene [1,2] 4475 Volatile Organic Compounds(VOCs)	ug/L	12.3±0.119	0	0
Chloroethane [1,2] 4485 Volatile Organic Compounds(VOCs)	ug/L	37.6±0.365	0	0
2-Chlorotoluene [1,2] 4535 Volatile Organic Compounds(VOCs)	ug/L	6.12±0.059	0	0
4-Chlorotoluene [1,2] 4540 Volatile Organic Compounds(VOCs)	ug/L	3.93±0.038	0	0
Dibromomethane [1,2] 4595 Volatile Organic Compounds(VOCs)	ug/L	5.9±0.057	0	0
1,2-Dichlorobenzene [1,2] 4610 Volatile Organic Compounds(VOCs)	ug/L	5.17±0.05	0	0
1,3-Dichlorobenzene [1,2] 4615 Volatile Organic Compounds(VOCs)	ug/L	15±0.146	0	0
1,4-Dichlorobenzene [1,2] 4620 Volatile Organic Compounds(VOCs)	ug/L	16.8±0.163	0	0
Dichlorodifluoromethane [1,2] 4625 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
Dichlorofluoromethane [2] 4627 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
1,1-Dichloroethane [1,2] 4630 Volatile Organic Compounds(VOCs)	ug/L	4.74±0.046	0	0
1,2-Dichloroethane [1,2] 4635 Volatile Organic Compounds(VOCs)	ug/L	13.8±0.134	0	0
1,1-Dichloroethylene [1,2] 4640 Volatile Organic Compounds(VOCs)	ug/L	13±0.126	0	0

cis-1,2-Dichloroethylene [1,2] 4645 Volatile Organic Compounds(VOCs)	ug/L	14.4±0.139	0	0
1,2-Dichloropropane [1,2] 4655 Volatile Organic Compounds(VOCs)	ug/L	14.5±0.141	0	0
1,3-Dichloropropane [1,2] 4660 Volatile Organic Compounds(VOCs)	ug/L	13.4±0.13	0	0
2,2-Dichloropropane [1,2] 4665 Volatile Organic Compounds(VOCs)	ug/L	5.89±0.057	0	0
1,1-Dichloropropene [1,2] 4670 Volatile Organic Compounds(VOCs)	ug/L	16.1±0.156	0	0
cis-1,3-Dichloropropene [1,2] 4680 Volatile Organic Compounds(VOCs)	ug/L	7.17±0.07	0	0
trans-1,3-Dichloropropene [1,2] 4685 Volatile Organic Compounds(VOCs)	ug/L	9.55±0.093	0	0
trans-1,2-Dichloroethylene [1,2] 4700 Volatile Organic Compounds(VOCs)	ug/L	13.3±0.129	0	0
Ethylbenzene [1,2] 4765 Volatile Organic Compounds(VOCs)	ug/L	13.9±0.134	0	0
Hexachlorobutadiene [1,2] 4835 Volatile Organic Compounds(VOCs)	ug/L	39±0.379	0	0
Isopropylbenzene [1,2] 4900 Volatile Organic Compounds(VOCs)	ug/L	16.9±0.164	0	0
4-Isopropyltoluene [1,2] 4910 Volatile Organic Compounds(VOCs)	ug/L	9.2±0.089	0	0
Methyl bromide (Bromomethane) [1,2] 4950 Volatile Organic Compounds(VOCs)	ug/L	0.00	0	0
Methyl chloride (Chloromethane) [1,2] 4960 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
Methylene chloride (Dichloromethane) [1,2] 4975 Volatile Organic Compounds(VOCs)	ug/L	9.7±0.094	0	0
Methyl tert-butyl ether (MTBE) [1,2] 5000 Volatile Organic Compounds(VOCs)	ug/L	26.9±0.261	0	0
Naphthalene [1,2] 5005 Volatile Organic Compounds(VOCs)	ug/L	12.3±0.119	0	0
n-Propylbenzene (1-Phenylpropane) [1,2] 5090 Volatile Organic Compounds(VOCs)	ug/L	5.62±0.054	0	0
Styrene [1,2] 5100 Volatile Organic Compounds(VOCs)	ug/L	12.4±0.121	0	0
1,1,1,2-Tetrachloroethane [1,2] 5105 Volatile Organic Compounds(VOCs)	ug/L	17.8±0.173	0	0
1,1,2,2-Tetrachloroethane [1,2] 5110 Volatile Organic Compounds(VOCs)	ug/L	3.85±0.037	0	0
Tetrachloroethylene (Perchloroethylene) [1,2] 5115 Volatile Organic Compounds(VOCs)	ug/L	8.73±0.085	0	0
Toluene [1,2] 5140 Volatile Organic Compounds(VOCs)	ug/L	5.74±0.056	0	0
1,2,3-Trichlorobenzene [1,2] 5150 Volatile Organic Compounds(VOCs)	ug/L	34.2±0.331	0	0
1,2,4-Trichlorobenzene [1,2] 5155 Volatile Organic Compounds(VOCs)	ug/L	6.1±0.059	0	0

1,1,1-Trichloroethane [1,2] 5160 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
1,1,2-Trichloroethane [1,2] 5165 Volatile Organic Compounds(VOCs)	ug/L	13.2±0.128	0	0
Trichloroethene (Trichloroethylene) [1,2] 5170 Volatile Organic Compounds(VOCs)	ug/L	16.7±0.162	0	0
Trichlorofluoromethane [1,2] 5175 Volatile Organic Compounds(VOCs)	ug/L	0	0	0
1,2,3-Trichloropropane [1,2] 5180 Volatile Organic Compounds(VOCs)	ug/L	14.7±0.143	0	0
1,2,4-Trimethylbenzene [1,2] 5210 Volatile Organic Compounds(VOCs)	ug/L	13.3±0.129	0	0
1,3,5-Trimethylbenzene [1,2] 5215 Volatile Organic Compounds(VOCs)	ug/L	4.06±0.039	0	0
Vinyl chloride [1,2] 5235 Volatile Organic Compounds(VOCs)	ug/L	10.1±0.098	0	0
m+p-Xylene [1,2] 5240 Volatile Organic Compounds(VOCs)	ug/L	14.2±0.138	0	0
o-Xylene [1,2] 5250 Volatile Organic Compounds(VOCs)	ug/L	17.8±0.173	0	0
Xylene, total [1,2] 5260 Volatile Organic Compounds(VOCs)	ug/L	32.1±0.311	0	0
Benzene [1,2] 4375	ug/L	9.94±0.1	0	0
Bromobenzene [1,2] 4385	ug/L	16.6±0.161	0	0
Bromochloromethane [1,2] 4390	ug/L	0	0	0
n-Butylbenzene [1,2] 4435	ug/L	11.6±0.113	0	0
sec-Butylbenzene [1,2] 4440	ug/L	4.53±0.044	0	0
tert-Butylbenzene [1,2] 4445	ug/L	5.48±0.053	0	0
Carbon tetrachloride [1,2] 4455	ug/L	0	0	0
Chlorobenzene [1,2] 4475	ug/L	12.3±0.119	0	0
Chloroethane [1,2] 4485	ug/L	37.6±0.365	0	0
2-Chlorotoluene [1,2] 4535	ug/L	6.12±0.059	0	0
4-Chlorotoluene [1,2] 4540	ug/L	3.93±0.038	0	0
Dibromomethane [1,2] 4595	ug/L	5.9±0.057	0	0
1,2-Dichlorobenzene [1,2] 4610	ug/L	5.17±0.05	0	0
1,3-Dichlorobenzene [1,2] 4615	ug/L	15±0.146	0	0

1,4-Dichlorobenzene [1,2] 4620	ug/L	16.8±0.163	0	0
Dichlorodifluoromethane [1,2] 4625	ug/L	0	0	0
Dichlorofluoromethane [2] 4627	ug/L	0	0	0
1,1-Dichloroethane [1,2] 4630	ug/L	4.74±0.046	0	0
1,2-Dichloroethane [1,2] 4635	ug/L	13.8±0.134	0	0
1,1-Dichloroethylene [1,2] 4640	ug/L	13±0.126	0	0
cis-1,2-Dichloroethylene [1,2] 4645	ug/L	14.4±0.139	0	0
1,2-Dichloropropane [1,2] 4655	ug/L	14.5±0.141	0	0
1,3-Dichloropropane [1,2] 4660	ug/L	13.4±0.13	0	0
2,2-Dichloropropane [1,2] 4665	ug/L	5.89±0.057	0	0
1,1-Dichloropropene [1,2] 4670	ug/L	16.1±0.156	0	0
cis-1,3-Dichloropropene [1,2] 4680	ug/L	7.17±0.07	0	0
trans-1,3-Dichloropropene [1,2] 4685	ug/L	9.55±0.093	0	0
trans-1,2-Dichloroethylene [1,2] 4700	ug/L	13.3±0.129	0	0
Ethylbenzene [1,2] 4765	ug/L	13.9±0.134	0	0
Hexachlorobutadiene [1,2] 4835	ug/L	39±0.379	0	0
Isopropylbenzene [1,2] 4900	ug/L	16.9±0.164	0	0
4-Isopropyltoluene [1,2] 4910	ug/L	9.2±0.089	0	0
Methyl bromide (Bromomethane) [1,2] 4950	ug/L	0.00	0	0
Methyl chloride (Chloromethane) [1,2] 4960	ug/L	0	0	0
Methylene chloride (Dichloromethane) [1,2] 4975	ug/L	9.7±0.094	0	0
Methyl tert-butyl ether (MTBE) [1,2] 5000	ug/L	26.9±0.261	0	0
Naphthalene [1,2] 5005	ug/L	12.3±0.119	0	0
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Styrene [1,2] 5100	ug/L	12.4±0.121	0	0

1,1,1,2-Tetrachloroethane [1,2] 5105	ug/L	17.8±0.173	0	0
1,1,2,2-Tetrachloroethane [1,2] 5110	ug/L	3.85±0.037	0	0
Tetrachloroethylene (Perchloroethylene) [1,2] 5115	ug/L	8.73±0.085	0	0
Toluene [1,2] 5140	ug/L	5.74±0.056	0	0
1,2,3-Trichlorobenzene [1,2] 5150	ug/L	34.2±0.331	0	0
1,2,4-Trichlorobenzene [1,2] 5155	ug/L	6.1±0.059	0	0
1,1,1-Trichloroethane [1,2] 5160	ug/L	0	0	0
1,1,2-Trichloroethane [1,2] 5165	ug/L	13.2±0.128	0	0
Trichloroethene (Trichloroethylene) [1,2] 5170	ug/L	16.7±0.162	0	0
Trichlorofluoromethane [1,2] 5175	ug/L	0	0	0
1,2,3-Trichloropropane [1,2] 5180	ug/L	14.7±0.143	0	0
1,2,4-Trimethylbenzene [1,2] 5210	ug/L	13.3±0.129	0	0
1,3,5-Trimethylbenzene [1,2] 5215	ug/L	4.06±0.039	0	0
Vinyl chloride [1,2] 5235	ug/L	10.1±0.098	0	0
m+p-Xylene [1,2] 5240	ug/L	14.2±0.138	0	0
o-Xylene [1,2] 5250	ug/L	17.8±0.173	0	0
Xylene, total [1,2] 5260	ug/L	32.1±0.311	0	0

Definitions and Interpretation of Statistical Analysis:

Assigned Value: Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Accept. Window: The range of values that constitute acceptable performance for a laboratory participating in this PT study.

Z: A Z-Score tells how a single data point compares to normal data. A Z-Score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a Z-Score less than |2| is considered to be in control, a Z-Score between |2| and |3| is considered 'Questionable', but still within control and a Z greater than |3| is considered not acceptable and the method is out of control. For WS studies, a z-score greater than |2| is unacceptable. Calculated as **Z = (Reported Value - Assigned Value) / Proficiency Std. Dev.**

Proficiency Std. Dev.: Standard deviation calculated based on **Evaluation Criteria.**

Study Mean: Statistical study mean calculated using a robust statisitical model (RTC employs the 'Biweight Program'). Robust statistical techniques to minimize the influence that extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Study Std. Dev.: Standard deviation calculated from study data using robust statisicals (Biweight).

Gravimetric Value: The 'prepared to' value, determined by gravimetric means. The uncertainty associated to this value is standard uncertainty and based on RTC's gravimetric tolerances.

Evaluation Criteria:

1 - Regression Equation - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a * gravimetric + b and proficiency standard deviation = c * gravimetric + d.

2 - Study Robust Mean and c,d regression - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = c * proficiency value + d.

3 - Fixed Limits - Acceptance windows based on span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric * percentage.

4 - Adjustable Fixed Limits - Acceptance windows base on a span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric * lowPercentage where gravimetric < break and gravimetric +/-

gravimetric * highPercentage where gravimetric >= break.

5 - Study Statistics - Acceptance windows based on a number of standard deviations span from the study mean as study mean +/- (deviations * standard deviation).

6 - Log Transform Statistics - Acceptance windows based on lognormal distributed data. Acceptance windows = mean(lognormal) +/- span * standard deviation(lognormal).

7 - Reserved

8 - Regression Equation 2SD - Acceptance windows based on EPA equation of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a * gravimetric + b and proficiency standard deviation = c * gravimetric + d. Generally reserved for drinking water studies.

Proficiency Test Item Preparation, Homogeneity and Stability Assessment - RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. RTC's proficiency test materials meet requirements of ISO Guide 34. For more information contact RTC. Additionally RTC complies with TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

Metrological Traceability - All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO Guide 34 in conjunction with ISO/IEC 17025.

Statistical Analysis - RTC uses robust statistics to calculate study means and standard deviations - Reference - Kafadar, K, A Biweight Approach to the One-Sample Problem, Journal of the American Statistical Association, Vol. 77, No. 378, June, 1982, pp. 416-424.

Additional Information - Go to www.pt.sigmainformatics.com for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis, and additional comments/recommendations. If you failed an analyte it may be required to perform a corrective action and/or retest. RTC recommends that you contact your accreditation body for specific instruction.

Program analyte accrediting footnotes

[1] NELAC Compliant, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

[2] ISO 17043 Accredited, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Authorizing Officer: 

Date: 1/4/2017

Patrick Brumfield, ASQ CQA

QA Manager

This section of the report is for informational purposes only. If you are unsure about specific accreditation requirements, please contact your state coordinator.

UNACCEPTABLE ANALYTES

RTC Lab Code: **49670108**

PE1358-1KT

Complete Volatiles Kit - WS

Analytes	MethodNumber	MethodName
1,2,3-Trichlorobenzene [1,2]	10088809	EPA 524.2 4.1 (1995)
Chloroethane [1,2]	10088809	EPA 524.2 4.1 (1995)

PASS RATE

Number of Reported Results:	59
Number of Passing Results:	57
Pass Rate:	96.61%