APPENDIX H: LABORATORY DATA

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Clean Air Engineering, Inc.

500 West Wood Street
Palatine, IL 60067

Project Number: 13318

Particulate Matter, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Phosphorus, Selenium, Silver, Thallium, Zinc & Mercury

EPA Methods 5 & 29 Analyses

Analytical Report
30146

el1

Element One, Inc.
6319-D Carolina Beach Rd., Wilmington, NC 28412
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 30146
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Daphne Woodman, B.S. Chemist
November 2, 2017

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
November 2, 2017

SUMMARY OF RESULTS

Summary of Analysis

Shredder Outlet - Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	H_2O_2 /HNO_3 µg	Empty Impinger µg	$KMnO_4$ µg	HCl µg
TTE Exhaust Duct-M29/5-R1	#1	30.8	< 0.1	< 0.4	< 0.2	11.5	19.3
	#2		< 0.1	< 0.4	< 0.2	11.5	19.4
TTE Exhaust Duct-M29/5-R2	#1	26.9	0.126	< 0.4	< 0.2	9.98	16.9
	#2		0.129	< 0.4	< 0.2	9.73	17.0
TTE Exhaust Duct-M29/5-R3	#1	52.6	0.135	< 0.4	< 0.2	22.0	30.8
	#2		0.133	< 0.4	< 0.2	21.8	30.3
TTE Exhaust Duct-M29/5-R4	#1	67.9	0.106	< 0.4	< 0.2	24.0	43.8
	#2		0.105	< 0.4	< 0.2	24.0	43.8
TTE Exhaust Duct-M29/5-R5	#1	142	0.201	< 0.4	< 0.2	67.7	73.5
	#2		0.198	< 0.4	< 0.2	67.9	75.0
Field Blank	#1	< 0.5	< 0.1	< 0.3	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.3	< 0.2	< 0.5	< 0.4
Reagent Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4

Shredder Outlet TTE Exhaust Duct – Summary of Method 5 Particulate Analysis

Fraction	M29/5-R1 e30146-1 Catch, mg	M29/5-R2 e30146-2 Catch, mg	M29/5-R3 e30146-3 Catch, mg	M29/5-R4 e30146-4 Catch, mg	M29/5-R5 e30146-5 Catch, mg
Filter	12.4	10.2	19.0	14.2	9.4
Rinse	7.8	8.8	18.7	12.8	13.4
Total PM	20.2	19.0	37.7	27.0	22.8

Summary of Analysis

Shredder Outlet TTE Exhaust Duct – Summary of Method 29 Metals Analysis

Element	M29/5-R1 e30146-1 Total µg	M29/5-R2 e30146-2 Total µg	M29/5-R2 e30146-2 dup Total µg	M29/5-R3 e30146-3 Total µg
Antimony	1.63	1.33	1.30	2.21
Arsenic	< 1	< 1	< 1	< 1
Barium	12.2	11.9	12.2	19.8
Beryllium	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium	3.06	2.11	1.87	3.19
Chromium	8.50	7.22	7.37	12.7
Cobalt	0.762	0.732	0.742	1.18
Copper	11.1	11.8	11.5	19.0
Lead	20.3	21.6	21.9	50.9
Nickel	7.33	5.85	5.98	8.45
Phosphorus	46.9	53.6	52.5	67.0
Selenium	4.59	2.46	2.35	3.84
Silver	0.447	0.263	0.235	0.381
Thallium	< 0.2	< 0.2	< 0.2	< 0.2
Zinc	805	578	585	1099

Element	M29/5-R4 e30146-4 Total µg	M29/5-R5 e30146-5 Total µg
Antimony	2.16	1.96
Arsenic	< 1	< 1
Barium	16.8	17.6
Beryllium	< 0.05	< 0.05
Cadmium	1.87	3.50
Chromium	10.4	9.43
Cobalt	1.36	0.768
Copper	15.8	14.6
Lead	46.3	41.9
Nickel	7.90	8.12
Phosphorus	63.5	66.4
Selenium	< 1	< 1
Silver	< 0.2	< 0.2
Thallium	< 0.2	< 0.2
Zinc	1250	1100

Summary of Analysis

Blanks - Summary of Method 5 Particulate Analysis

Fraction	Field Blank e30146-7 Catch, mg	Reagent Blank e30146-8 Catch, mg
Filter	< 0.1	NA
Rinse	0.4	0.6
Total PM	0.4	0.6

Blanks - Summary of Method 29 Metals Analysis

Element	Field Blank e30146-7 Total µg	Reagent Blank e30146-8 Total µg
Antimony	< 0.2	< 0.2
Arsenic	< 0.2	< 0.2
Barium	6.15	2.87
Beryllium	< 0.05	< 0.05
Cadmium	< 0.2	< 0.2
Chromium	1.42	1.38
Cobalt	< 0.2	< 0.2
Copper	0.526	0.439
Lead	0.258	< 0.2
Nickel	2.05	2.01
Phosphorus	19.6	20.2
Selenium	< 0.2	< 0.2
Silver	< 0.2	< 0.2
Thallium	< 0.2	< 0.2
Zinc	2.53	2.12

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Clean Air, IL	Element One #:	30146
Client ID:	13318 Sims Metal Management Johnston, RI	Analyst:	JGP, MMP, DBW
Method:	Methods 29 & 5	Dates Received:	09/25/17
Analytes:	PM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, P, Se, Ag, Tl, Zn & Hg	Dates Analyzed:	09/26-10/03/17

Summary of Analysis

The Method 5 particulate samples were analyzed in accordance with EPA Method 5 guidelines. Particulate samples were weighed to a constant weight of ±0.5mg and reported to the nearest 0.1mg. The Method 29 samples were digested, prepared, and analyzed according to Method 29 protocol. Samples were analyzed for mercury on a PerkinElmer FIMS-100 CVAA mercury analyzer. The samples were analyzed for metals on a PerkinElmer NexION 350X ICP-MS.

Detection Limits

The FIMS-100 CVAA instrument reporting limit for mercury was 0.004 µg per aliquot analyzed. The ICP-MS instrument reporting limits were 0.25µg/L for beryllium, 20.0µg/L for phosphorus and 1.0µg/L for the other metals.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD), spike sample recovery and second source calibration verification data are summarized in the Quality Control Section. Due to matrix interference, it was necessary to analyze all samples for arsenic and selenium at a minimum five-fold dilution.

*Ref to page 13; the beryllium spike recovery for sample Shredder Outlet TTE Exhaust Duct-R3 was outside of laboratory guidelines of 75-125% with 63%. Sample was reanalyzed at a five-fold dilution resulting in 103% recovery. Sample was non-detect for beryllium at all dilutions.

All other QA/QC data was within the criteria of the method.

Rev. 11.02.17; to remove Run 6 per client's request.

Element One Analytical Narrative Cont.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values. The Method 5 blank correction factor has not been implemented. The reported results relate only to the items tested or calibrated.

The ICP analysis of the blank samples revealed detectable concentrations of metals. The corresponding prepared front half and archived back half samples were analyzed to determine the source of the metals. The results are summarized in the tables below.

Element	Field Blank Total µg	Field Blank Prepared Front Half Total µg	Filed Blank Archived Back Half Total µg
Barium	6.15	8.07	< 0.34
Chromium	1.42	1.10	0.530
Copper	0.526	0.249	< 0.34
Lead	0.258	0.170	< 0.34
Nickel	2.05	1.86	< 0.34
Phosphorus	19.6	3.66	19.4
Zinc	2.53	1.33	1.49

Element	Reagent Blank Total µg	Reagent Blank Prepared Front Half Total µg	Archived c8a 0.1N HNO_3 Total µg	Archived c9 5% HNO_3/10% H_2O_2 Total µg
Barium	2.87	2.76	< 0.3	< 0.19
Chromium	1.38	1.20	0.525	< 0.19
Copper	0.439	0.265	< 0.3	< 0.19
Nickel	2.01	1.85	< 0.3	< 0.19
Phosphorus	20.2	5.14	7.21	16.0
Zinc	2.12	1.13	0.617	0.257

This is the first revision to this report; per the client's request Run 6 was omitted.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Shredder Outlet - Mercury Duplicate Analysis RPD

(Method 29 QC limits: < 10% for RPD)

Run Number	Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
TTE Exhaust Duct-M29/5-R1	NA	NA	NA	0.1%	0.6%
TTE Exhaust Duct-M29/5-R2	2.5%	NA	NA	2.5%	0.6%
TTE Exhaust Duct-M29/5-R3	1.3%	NA	NA	0.7%	1.4%
TTE Exhaust Duct-M29/5-R4	0.8%	NA	NA	0.0%	0.1%
TTE Exhaust Duct-M29/5-R5	1.4%	NA	NA	0.3%	2.1%
Field Blank	NA	NA	NA	NA	NA
Reagent Blank	NA	NA	NA	NA	NA

Shredder Outlet - Mercury Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Run Number		Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
TTE Exhaust Duct-M29/5-R3	#1	95%	96%	94%	80%	96%
	#2	95%	96%	94%	80%	98%

Summary of Quality Control Data

Shredder Outlet - Metals Duplicate Analysis RPD

(Method 29 QC limits: < 20% for RPD)

Element	TTE Exhaust Duct-M29/5-R2 RPD
Antimony	2.1%
Arsenic	NA
Barium	1.9%
Beryllium	NA
Cadmium	11.7%
Chromium	2.0%
Cobalt	1.4%
Copper	2.3%
Lead	1.3%
Nickel	2.1%
Phosphorus	2.0%
Selenium	4.4%
Silver	11.2%
Thallium	NA
Zinc	1.3%

Summary of Quality Control Data

Shredder Outlet - Metals Analysis Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Element	TTE Exhaust Duct-M29/5-R3 Recovery
Antimony	108%
Arsenic	94%
Barium	97%
Beryllium	63%*
Cadmium	101%
Chromium	98%
Cobalt	101%
Copper	120%
Lead	99%
Nickel	94%
Phosphorus	108%
Selenium	87%
Silver	98%
Thallium	88%
Zinc	88%

*See Analytical Narrative, page 8.

Summary of Quality Control Data

Second Source Calibration Check Recoveries

(QC limits: ±10% for Second Source Continuing Check Standard)*

Element	0.25 ppb	1 ppb	50 ppb	100 ppb*	250 ppb
Antimony		107%	104%	103%	102%
Arsenic		99%	99%	99%	100%
Barium		107%	103%	103%	102%
Beryllium	102%	107%	104%	104%	102%
Cadmium		102%	97%	97%	97%
Chromium		121%	105%	102%	101%
Cobalt		109%	105%	107%	101%
Copper		111%	102%	104%	100%
Lead		98%	101%	102%	100%
Nickel		111%	105%	105%	103%
Selenium		103%	102%	101%	99%
Silver		112%	100%	110%	106%
Thallium		103%	94%	104%	99%
Zinc		98%	104%	103%	103%

Element	21 ppb	250 ppb	1100 ppb*	2500 ppb
Phosphorus	116%	102%	104%	103%

SAMPLE CUSTODY

e30146

66-13318-1

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	1	QUARTZ FILTER PETRI DISH

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	1	Filter No. e2-152-21	1	Y/NA	X	X	X		Metals include: Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phosphorus (P), Selenium (Se), Silver (Ag), Thallium (Tl), Zinc (Zn)
	9/15	TTE Exhaust Duct	2	Filter No. e2-152-22	1	Y/NA	X	X	X		
	9/18	TTE Exhaust Duct	3	Filter No. e2-152-23	1	Y/NA	X	X	X		
	9/18	TTE Exhaust Duct	4	Filter No. e2-152-25	1	Y/NA	X	X	X		
	9/20	TTE Exhaust Duct	5	Filter No. e2-152-27	1	Y/NA	X	X	X		
	9/20	TTE Exhaust Duct	6	Filter No. e2-152-26	1	Y/NA	X	X	X		
	9/18	TTE Exhaust Duct	Field Blank	Filter No. e2-152-24	1	Y/NA				X	

Note: Front and Back Half combined
Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
	9/25/17 0950	Via FedEx				

All M5-29 samples rec'd in good condition in Fisher brand + Level 2 QFC containers. -KLG

e30146

66-13318-2

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	2	FRONT HALF ACETONE RINSE 500 mL CLEAR GLASS

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	Train Proof	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y				X	Metals include: Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phosphorus (P), Selenium (Se), Silver (Ag), Thallium (Tl), Zinc (Zn)
	9/15	TTE Exhaust Duct	1	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/15	TTE Exhaust Duct	2	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/18	TTE Exhaust Duct	3	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/18	TTE Exhaust Duct	4	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/20	TTE Exhaust Duct	5	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/20	TTE Exhaust Duct	6	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y	X	X	X		
	9/18	Unit X Stack	Field Blank	Front Half Acetone Rinse, 500 mL Clear Glass	1	Y				X	

Note: Front and Back Half combined Analysis

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E. Doak	9/22/2017 17:00	Eric Doak				B. Ansell
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e30146

66-13318-3

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3365 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	3	FRONT HALF HNO_3 RINSE 250 mL HDPE

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	Train Proof	Front Half HNO3 Rinse, 250 mL HDPE	1	Y				X	Metals include: Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phosphorus (P), Selenium (Se), Silver (Ag), Thallium (Tl), Zinc (Zn)
	9/15	TTE Exhaust Duct	1	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/15	TTE Exhaust Duct	2	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/18	TTE Exhaust Duct	3	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/18	TTE Exhaust Duct	4	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/20	TTE Exhaust Duct	5	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/20	TTE Exhaust Duct	6	Front Half HNO3 Rinse, 250 mL HDPE	1	Y		X	X		
	9/18	Unit X Stack	Field Blank	Front Half HNO3 Rinse, 250 mL HDPE	1	Y			X		

ANALYSIS REQUESTED

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time
E. Doak	9/22/2017 17:00				
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Signature | Date

e30146

66-13318-4

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-827-0033 (phone)
847-991-3365 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	4	IMPINGERS 1-3 CATCH AND RINSE 1000 mL HDPE

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?		ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	1	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			Metals Include: Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phosphorus (P), Selenium (Se), Silver (Ag), Thallium (Tl), Zinc (Zn)
	9/15	TTE Exhaust Duct	2	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			
	9/18	TTE Exhaust Duct	3	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			
	9/18	TTE Exhaust Duct	4	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			
	9/20	TTE Exhaust Duct	5	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			
	9/20	TTE Exhaust Duct	6	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y		X	X			
	9/18	Unit X Stack	Field Blank	Impingers 1-3 Catch and Rinse, 1000 mL HDPE	1	Y				X		

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
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e 30146

66-13318-5

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5A	IMPINGER 4 CATCH AND RINSE 250 mL HDPE

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	1	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/15	TTE Exhaust Duct	2	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/18	TTE Exhaust Duct	3	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/18	TTE Exhaust Duct	4	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/20	TTE Exhaust Duct	5	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/20	TTE Exhaust Duct	6	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y			X		
	9/18	Unit X Stack	Field Blank	Impinger 4 Catch and Rinse, 250 mL HDPE	1	Y				X	

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
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	9/25/17 0950					

e30146

66-13318-6

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3365 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5B	IMPINGERS 5-6 CATCH AND RINSE 950 mL AMBER GLASS

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/15	TTE Exhaust Duct	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/18	TTE Exhaust Duct	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/18	TTE Exhaust Duct	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/20	TTE Exhaust Duct	5	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/20	TTE Exhaust Duct	6	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y			X		
	9/18	Unit X Stack	Field Blank	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1	Y				X	

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
	9/25/17 0950					

e 30146

66-13318-7

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3365 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5C	IMPINGERS 5-6 8N HCL RINSE 250 mL AMBER GLASS

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0128 (phone)
Ken Smith

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	9/15	TTE Exhaust Duct	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/15	TTE Exhaust Duct	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/18	TTE Exhaust Duct	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/18	TTE Exhaust Duct	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/20	TTE Exhaust Duct	5	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/20	TTE Exhaust Duct	6	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y			X		
	9/18	Unit X Stack	Field Blank	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1	Y				X	

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
	9/25/17 0950					

e30146

CLIENT: Sims Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

66-13318-6

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3365 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	SEE BELOW (IF APPLICABLE)	REAGENT BLANKS

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive
	9/20	Reagent Blank	All	Acetone (200 mL), Container 7: 250 mL Clear Glass	1		X	X	X	
	9/20	Reagent Blank	All	0.1 N HNO_3 (300 mL), Container 8A: 1000 mL HDPE	1			X	X	
	9/20	Reagent Blank	All	DI Water (100 mL), Container 8B: 250 mL HDPE	1			X	X	
	9/20	Reagent Blank	All	5% HNO_3 / 10% H_2O_2 (200 mL), Container 9: 250 mL HDPE	1			X	X	
	9/20	Reagent Blank	All	4% $KMnO_4$ / 10% H_2SO_4 (100 mL), Container 10: 250 mL Amber Glass	1				X	
	9/20	Reagent Blank	All	DI Water (200 mL) / 6N HCl (25 mL), Container 11: 250 mL Amber Glass	1				X	
	9/20	Reagent Blank	All	Quartz Filters (3), Container 12: 250 mL HDPE	1			X	X	

ANALYSIS REQUESTED

FORWARDING LAB
Element One, Inc.
6318-D Carolina Beach Rd
Wilmington, NC 28412
910-793-0126 (phone)
Ken Smith

ADDITIONAL INFORMATION

Metals include:
Antimony (Sb)
Arsenic (As)
Barium (Ba)
Beryllium (Be)
Cadmium (Cd)
Chromium (Cr)
Cobalt (Co)
Copper (Cu)
Lead (Pb)
Mercury (Hg)
Nickel (Ni)
Phosphorus (P)
Selenium (Se)
Silver (Ag)
Thallium (Tl)
Zinc (Zn)

Note: Front and Back Half combined Analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00					B. Ansell
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
	9/23/17 0950					

ANALYTICAL DATA

Analytical Calculations

Metals-

Element Results (µg) =ICP Results (µg/L)*Dilution*Final Volume (L)

Where-

ICP Results= Raw sample concentration (ppb)--*ICP-Data Sheet*

Dilution= Diluted Volume--*ICP-MS Run Sheet*
Aliquot

Final Volume=FH=Final Volume (FV)--*Sample Submission*
BH=Received Volume (BV) *Final Volume (FV)--*Sample Submission*
Aliquot (Used)
Combined Results=FH+BH

Mercury-

Mercury Results (µg) =CVAA Results (µg) *Final Volume (ml)
Aliquot (ml)

Where-

CVAA Results= Raw sample reading (µg)--*Hg-Data Sheet*

Aliquot= Sample Aliquot (Alq.)--*Hg-Data Sheet*

Final Volume=Final Volume (FV)*--*Sample Submission*
* With the exception of the BH fraction where-
=Received Volume (BV)--*Sample Submission*

Analytical Calculations

Spike Recovery-

$$\textbf{Spike (\%)} = \frac{\textbf{(Spiked Result (µg/L) – Sample Result (µg/L))}}{\textbf{Spike Amount (µg/L)}} \textbf{ X100}$$

Where-

Spike Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Sample Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Spike Amount--*ICP-MS Spike Table*

Duplicate Analysis RPD-

$$\textbf{RPD (\%)} = \frac{\textbf{(Duplicate Result (µg/L) - Sample Result (µg/L))}}{\textbf{Average (µg/L)}} \textbf{ X100}$$

Where-

Sample Result =Raw sample concentration (ppb)--*ICP-Data Sheet*

Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

Average= $\frac{\textit{(Duplicate + Sample Results)}}{2}$

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 30146**

FH / BH Combined

Analysis Due Date 10.03.17
QA/QC/Report Due Date 10.05.17

Client	Clean Air IL
Project No	13318

Date Rec	09.25.17
Time Rec	0950

HNO_3 Lot: 57052	HF Lot: 5115033	HCl Lot: 4116090	**Ref. Method:**
Volume Marked Y / N	Volume Loss Y / N / ?	~~4116090~~ DKH Acetone: 57006	**29 / 5**

Sample Identification

Shredder Outlet		Shredder Outlet		Blanks	
1	TTE Exhaust Duct-M29-R1	4	TTE Exhaust Duct-M29-R4	7	Field Blank
2	TTE Exhaust Duct-M29-R2	5	TTE Exhaust Duct-M29-R5	8	Reagent Blank
	TTE Exhaust Duct-M29-R2	6	TTE Exhaust Duct-M29-R6		
3	TTE Exhaust Duct-M29-R3				
	TTE Exhaust Duct-M29-R3 Spike				

Analyses Requested	Samples 1-8	Hg ✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓
	Samples 1-8	Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, P, Se, Ag, Tl, Zn
	Samples 1-8	PM

Runs / FB	Fil / Ace (FH)		HNO_3 (FH)		5% HNO_3/10% H_2O_2 (BH)			HNO_3 (A)		$KMnO_4$ (B)		HCl (C)	
			pH <2.0 Y / N		pH <2.0 Y / N			pH <2.0 Y / N		pH <2.0 Y / N		pH <2.0 Y / N	
Lab ID	Fil ID	BV ml	BV ml	FV ml	BV ml	Used	FV ml	BV ml	FV ml	BV ml	FV ml	BV ml	FV ml
1	152-21	136	118	100	380	190	50	112	200	390	500	220	400
2.D	152-22	146	104	↓	395	197	↓	100	↓	390	↓	220	↓
3.S	152-23	740	130	↓	410	205	↓	102	↓	380	↓	225	↓
4	152-25	236	130	↓	420	210	↓	102	↓	395	↓	220	↓
5	15227	184	140	↓	405	200	↓	~~98~~ 96	↓	405	↓	225	↓
6	152-26	226	122	↓	380	190	↓	98	↓	400	↓	225	↓
7	152-24	192	140	↓	340	170	↓	102	↓	395	↓	225	↓

M-29 Reagent Blank

Lab ID	Fraction			BV, ml	FV, ml	Comments
8	C-7	FH	Acetone Blank	218		
	C-8A	FH	0.1N HNO_3	300	100	used 100mls
	C-8A	A	0.1N HNO_3	300	↓	
	C-8B	B	DI H_2O	100	100+33	used 33mls
	C-9	BH	5% HNO_3/10% H_2O_2	190	50	used 95mls
	C-10	B	4% $KMnO_4$/10%H_2SO_4	495	100+33	used 100mls
	C-11	C	8N HCl DI H_2O	230	400	
	C-12	FH	Filter			

Lab Communications

LRB+ Spiked w/ 0.1mls 25ppm Std A, B + C (021417-A,B,C) MMP 9/28/17
LRB+ Spiked w/ 0.1mls 100ppm Std F (021417-F)
samples 5A, 6A & 8A reacted to Potassium persulfate

Fractions Received: Runs/FB; C1, C2, C3, C4, C5A, C5B, C5C—RB; C7, C8A, C8B, C9, C10, C11, C12 –KLG 09.25.17

SS Page 1 of 1
9/25/2017 2:28:32 PM
SS by KLG
Labeled By MMP 9/25/17

FH Prep By/Date MMP 9/28/17 A Prep By/Date DKH 9/25/17
BH Prep By/Date MMP 9/28/17 B Prep By/Date MMP 9/25/17
BH/FH Prep By/Date DKH 9/28/17 C Prep By/Date DKH 9/26/17
PM Prep By/Date [illegible] ID Verification By / Date [illegible] 9-25-17
Hg Prep DKH 9/25/17

elementOne

Method 5 Particulate

Lab # 30146

Client CAE IL

Balance checks

Date: 09.27.17 2g = 2.0000
Date: 09.28.17 2g = 2.0001
Date: 2g =

Acetone Concentration
3.48E-06 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 09.27.17 Initials - JGP		Date - 09.27.17 Initials - JGP		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
30146-1	e2-152-21	1	0.3574	1000	0.3700	1330	0.3698			
30146-2	e2152-22	2	0.3699	1000	0.3803	1330	0.3801			
30146-3	e2-152-23	3	0.3436	1000	0.3630	1330	0.3626			
30146-4	e2-152-25	4	0.3445	1000	0.3589	1330	0.3587			
30146-5	e2-152-27	5	0.3579	1000	0.3675	1330	0.3673			
30146-6	e2-152-26	6	0.3729	1000	0.3793	1330	0.3792			
Client Blk										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 09.27.17 Initials - JGP		Date - 09.27.17 Initials - JGP		Date - 09.28.17 Initials - JGP		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
30146-1	136	x34	9.9781	1000	9.9859	1330	9.9859			
30146-2	146	543	10.1495	1000	10.1590	1330	10.1583	915	10.1586	
30146-3	240	x81	10.3518	1000	10.3705	1330	10.3705			
30146-4	236	x94	10.3320	1000	10.3448	1330	10.345			
30146-5	184	822	9.9928	1000	10.0064	1330	10.0062			
30146-6	226	x93	10.5322	1000	10.5416	1330	10.5417			
Client Ace Blk	218	863	10.1390	1000	10.1395	1330	10.1396			
E1 Acetone Blank	100	778	11.0436	1000	11.044	1330	11.0437			

Total Catches

Sample ID #	Filter ID	Filter Tare, g	Final Filter + Catch, g	Filter Catch, mg		Acetone Bag ID	Bag Tare, g	Final Bag + Ace Catch, g	Acetone Catch, mg	Total Catch, mg
30146-1	e2-152-21	0.3574	0.3698	12.4		x34	9.9781	9.9859	7.8	20.2
30146-2	e2152-22	0.3699	0.3801	10.2		543	10.1495	10.1583	8.8	19.0
30146-3	e2-152-23	0.3436	0.3626	19.0		x81	10.3518	10.3705	18.7	37.7
30146-4	e2-152-25	0.3445	0.3587	14.2		x94	10.3320	10.3448	12.8	27.0
30146-5	e2-152-27	0.3579	0.3673	9.4		822	9.9928	10.0062	13.4	22.8
30146-6	e2-152-26	0.3729	0.3792	6.3		x93	10.5322	10.5416	9.4	15.7
Client Blk						863	10.139	10.1396	0.6	0.6
E1 Blank						778	11.0436	11.0437	0.1	0.1

Element One, Inc. Form 123 - Revision 2.01.24.12

elementOne

Method 5 Particulate

Lab # 30146

Client CAE IL

Balance checks Date: 09.27.17 2g = 2.0000
Date: 09.28.17 2g = 2.0001
Date: 2g =

Acetone Concentration 3.48E-06 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 09.27.17 Initials - JGP		Date - 09.27.17 Initials - JGP		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
30146-7	e2-152-24	7	0.3708	1000	0.3712	1330	0.3708			
Client Blk										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 09.27.17 Initials - JGP		Date - 09.27.17 Initials - JGP		Date - 09.28.17 Initials - JGP		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
30146-7	192	839	9.9825	1000	9.9837	1330	9.9829	915	9.9830	
Client Ace Blk	218	863	10.1390	1000	10.1396	1330	10.1396			
E1 Acetone Blank	100	778	11.0436	1000	11.0440	1330	11.0437			

Total Catches

Sample ID #	Filter ID	Filter Tare, g	Final Filter + Catch, g	Filter Catch, mg		Acetone Bag ID	Bag Tare, g	Final Bag + Ace Catch, g	Acetone Catch, mg	Total Catch, mg
30146-7	e2-152-24	0.3708	0.3708	< 0.1		839	9.9825	9.9829	0.4	0.4
Client Blk						863	10.139	10.1396	0.6	0.6
E1 Blank						778	11.0436	11.0437	0.1	0.1

Element One, Inc. Form 123 - Revision 2.01.24.12

elementOne **Method 29 Microwave Worksheet** Lab ID # e 30146

Client: clearair

Date Digested: 09.28.17 Initials: SAP Worksheet Prepared by: MMP

Auto Sample Loc.	Sample Lab ID	Sample Weight (g)	# of filters digested	Spike	Prep Volume (ml)	Weight In Micro / Weight Out Micro	Units
1	LRB+			1 mL A,B,C	F		
2	LRB						
3	30146-1		1				
5	-2						
6	-3						
7	-4						
8	-5						
10	-6						
11	-7						
13	-8						
14	M29 Cleaning						
15							

LRB+ spiked @ 0.1mL w/ 25ppm Std A,B,C (021417-A,B,C) & 0.1mL w/ 100ppm Std F (021417-F)

HF: 5115033 HNO3: 570572

Element One, Inc. Form 104 - Revision 1.0

Sample/Batch Report

Capt W 10/3/17

User Name: r2d2
Computer Name: PESERVICE-PC
Sample File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Sample\a6.sam
Report Date/Time: Tuesday, October 03, 2017 13:29:53

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
403		30146-1	CAE	Sample					
404		30146-2	CAE	Sample					
405	d	30146-2	CAE	Duplicate of 3					
406		30146-3	CAE	Sample					
407	s	30146-3	CAE	Spike - 1 of 5					
408		30146-4	CAE	Sample					
409		30146-5	CAE	Sample					
410		30146-6	CAE	Sample					
411		30146-7	CAE	Sample					
412		30146-8	CAE	Sample					
8		QC Std 6		Sample					
9		QC Std 7		Sample					
401		LRB		Sample					
402	s	LRB		Spike - 1 of 14					
413	x5	30146-1	CAE	Sample					
414	x5	30146-2	CAE	Sample					
415	x5d	30146-2	CAE	Duplicate of 17					
416	x5	30146-3	CAE	Sample					
417	x5s	30146-3	CAE	Spike - 1 of 19					
418	x10	30146-3	CAE	Sample					
419	x10s	30146-3	CAE	Spike - 1 of 21					
420	x5	30146-4	CAE	Sample					
421	x5	30146-5	CAE	Sample					
422	x5	30146-6	CAE	Sample					
423		New IS Check		Sample					
424		30146-7	CAE	Sample					
425		30146-7 FH	CAE	Sample					
426		30146-7 BH	CAE	Sample					
427		30146-8	CAE	Sample					
428		30146-8 FH	CAE	Sample					
429		30146-8 C8A	CAE	Sample					
430		30146-8 C9	CAE	Sample					
5		QC Std 2		Sample					
431	x50	30146-1	CAE	Sample					
432	x50	30146-2	CAE	Sample					
433	x50d	30146-2	CAE	Duplicate of 36					
434	x50	30146-3	CAE	Sample					
435	x50s	30146-3	CAE	Spike - 1 of 38					
436	x50	30146-4	CAE	Sample					
437	x50	30146-5	CAE	Sample					
438	x50	30146-6	CAE	Sample					
424		30146-7	CAE	Sample					
425		30146-7 FH	CAE	Sample					
426		30146-7 BH	CAE	Sample					
427		30146-8	CAE	Sample					
428		30146-8 FH	CAE	Sample					
429		30146-8 C8A	CAE	Sample					
430		30146-8 C9	CAE	Sample					
413	x5	30146-1	CAE	Sample					
414	x5	30146-2	CAE	Sample					
415	x5d	30146-2	CAE	Duplicate of 51					

416	x5	30146-3	CAE	Sample
417	x5s	30146-3	CAE	Spike - 1 of 53
420	x5	30146-4	CAE	Sample
421	x5	30146-5	CAE	Sample
422	x5	30146-6	CAE	Sample
406		30146-3	CAE	Sample
407	s	30146-3	CAE	Spike - 1 of 58
1		Blank		Sample
403		30146-1	CAE	Sample
404		30146-2	CAE	Sample
405	d	30146-2	CAE	Duplicate of 59
408		30146-4	CAE	Sample
409		30146-5	CAE	Sample
410		30146-6	CAE	Sample

Dataset Report

10/3/17

User Name: r2d2
Computer Name: PESERVICE-PC
Dataset File Path: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\100317-1a\
Report Date/Time: Tuesday, October 03, 2017 13:29:40

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant Prep. Vol.	Aliquot Vol.	Diluted Vol.
09:03:28 Tue 03-Oct-17	Blank		Blank				
09:06:31 Tue 03-Oct-17	Standard 1		Standard #1				
09:09:34 Tue 03-Oct-17	Standard 2		Standard #2				
09:12:38 Tue 03-Oct-17	Standard 3		Standard #3				
09:15:41 Tue 03-Oct-17	QC Std 1		QC Std #1				
09:18:45 Tue 03-Oct-17	QC Std 2		QC Std #2				
09:21:48 Tue 03-Oct-17	QC Std 3		QC Std #3				
09:24:52 Tue 03-Oct-17	QC Std 4		QC Std #4				
09:27:55 Tue 03-Oct-17	QC Std 5		QC Std #5				
09:30:59 Tue 03-Oct-17	QC Std 6		QC Std #6 — wrong A/S location				
09:34:03 Tue 03-Oct-17	QC Std 7		QC Std #7				
09:37:07 Tue 03-Oct-17	QC Std 8		QC Std #8				
09:40:11 Tue 03-Oct-17	QC Std 9		QC Std #9				
09:43:15 Tue 03-Oct-17	QC Std 10		QC Std #10				
09:46:20 Tue 03-Oct-17	QC Std 2		Sample				
09:49:24 Tue 03-Oct-17	30146-1		Sample	CAE			
09:52:28 Tue 03-Oct-17	30146-2		Sample	CAE			
09:55:32 Tue 03-Oct-17	30146-2	d	Duplicate of 17	CAE			
09:58:35 Tue 03-Oct-17	30146-3		Sample	CAE			
10:01:39 Tue 03-Oct-17	30146-3	s	Spike - 1 of 19	CAE			
10:04:43 Tue 03-Oct-17	30146-4		Sample	CAE			
10:07:47 Tue 03-Oct-17	30146-5		Sample	CAE			
10:10:50 Tue 03-Oct-17	30146-6		Sample	CAE			
10:13:54 Tue 03-Oct-17	30146-7		Sample	CAE			
10:16:59 Tue 03-Oct-17	QC Std 1		QC Std #1				
10:20:03 Tue 03-Oct-17	QC Std 4		QC Std #4				
10:23:06 Tue 03-Oct-17	30146-8		Sample	CAE			
10:26:13 Tue 03-Oct-17	QC Std 6		Sample ✓				
10:29:16 Tue 03-Oct-17	QC Std 7		Sample ✓				
10:36:08 Tue 03-Oct-17	LRB		Sample				
10:39:12 Tue 03-Oct-17	LRB	s	Spike - 1 of 30				
10:42:16 Tue 03-Oct-17	30146-1	x5	Sample	CAE			
10:45:20 Tue 03-Oct-17	30146-2	x5	Sample	CAE			
10:48:23 Tue 03-Oct-17	30146-2	x5d	Duplicate of 33	CAE			
10:51:27 Tue 03-Oct-17	30146-3	x5	Sample	CAE			
10:54:31 Tue 03-Oct-17	30146-3	x5s	Spike - 1 of 35	CAE			
10:57:34 Tue 03-Oct-17	30146-3	x10	Sample	CAE			
11:00:38 Tue 03-Oct-17	30146-3	x10s	Spike - 1 of 37	CAE			
11:03:42 Tue 03-Oct-17	30146-4	x5	Sample	CAE			
11:06:47 Tue 03-Oct-17	QC Std 1		QC Std #1				
11:09:51 Tue 03-Oct-17	QC Std 4		QC Std #4				
11:12:56 Tue 03-Oct-17	30146-5	x5	Sample	CAE			
11:15:59 Tue 03-Oct-17	30146-6	x5	Sample	CAE			
11:19:03 Tue 03-Oct-17	New IS Check		Sample				
11:22:07 Tue 03-Oct-17	30146-7		Sample	CAE			
11:25:10 Tue 03-Oct-17	30146-7 FH		Sample	CAE			
11:28:14 Tue 03-Oct-17	30146-7 BH undig		Sample	CAE			
11:31:18 Tue 03-Oct-17	30146-8		Sample	CAE			
11:34:21 Tue 03-Oct-17	30146-8 FH		Sample	CAE			

11:37:25 Tue 03-Oct-17	30146-8 C8A		Sample	CAE
11:40:29 Tue 03-Oct-17	30146-8 C9		Sample	CAE
11:43:34 Tue 03-Oct-17	QC Std 1		QC Std #1	
11:46:38 Tue 03-Oct-17	QC Std 2		QC Std #2	
11:49:43 Tue 03-Oct-17	QC Std 4		QC Std #4	
11:52:49 Tue 03-Oct-17	Blank		Blank	
11:54:52 Tue 03-Oct-17	Standard 1		Standard #1	
11:56:55 Tue 03-Oct-17	Standard 2		Standard #2	
11:58:59 Tue 03-Oct-17	Standard 3		Standard #3	
12:01:02 Tue 03-Oct-17	QC Std 1		QC Std #1	
12:03:06 Tue 03-Oct-17	QC Std 2		QC Std #2	
12:05:10 Tue 03-Oct-17	QC Std 3		QC Std #3	
12:07:14 Tue 03-Oct-17	QC Std 4		QC Std #4	
12:09:18 Tue 03-Oct-17	QC Std 5		QC Std #5	
12:11:21 Tue 03-Oct-17	QC Std 6		QC Std #6	
12:13:25 Tue 03-Oct-17	QC Std 7		QC Std #7	
12:15:29 Tue 03-Oct-17	QC Std 9		QC Std #9	
12:17:33 Tue 03-Oct-17	QC Std 10		QC Std #10	
12:19:38 Tue 03-Oct-17	QC Std 2		Sample	
12:21:43 Tue 03-Oct-17	30146-1	x50	Sample	CAE
12:23:47 Tue 03-Oct-17	30146-2	x50	Sample	CAE
12:25:50 Tue 03-Oct-17	30146-2	x50d	Duplicate of 70	CAE
12:27:54 Tue 03-Oct-17	30146-3	x50	Sample	CAE
12:29:57 Tue 03-Oct-17	30146-3	x50s	Spike - 1 of 72	CAE
12:32:01 Tue 03-Oct-17	30146-4	x50	Sample	CAE
12:34:04 Tue 03-Oct-17	30146-5	x50	Sample	CAE
12:36:08 Tue 03-Oct-17	30146-6	x50	Sample	CAE
12:38:12 Tue 03-Oct-17	30146-7		Sample	CAE
12:40:17 Tue 03-Oct-17	QC Std 1		QC Std #1	
12:42:20 Tue 03-Oct-17	QC Std 4		QC Std #4	
12:44:25 Tue 03-Oct-17	30146-7 FH		Sample	CAE
12:46:28 Tue 03-Oct-17	30146-7 BH undig		Sample	CAE
12:48:32 Tue 03-Oct-17	30146-8		Sample	CAE
12:50:35 Tue 03-Oct-17	30146-8 FH		Sample	CAE
12:52:39 Tue 03-Oct-17	30146-8 C8A		Sample	CAE
12:54:42 Tue 03-Oct-17	30146-8 C9		Sample	CAE
12:56:47 Tue 03-Oct-17	30146-1	x5	Sample	CAE
12:58:50 Tue 03-Oct-17	30146-2	x5	Sample	CAE
13:00:53 Tue 03-Oct-17	30146-2	x5d	Duplicate of 87	CAE
13:02:57 Tue 03-Oct-17	30146-3	x5	Sample	CAE
13:05:00 Tue 03-Oct-17	30146-3	x5s	Spike - 1 of 89	CAE
13:07:05 Tue 03-Oct-17	QC Std 1		QC Std #1	
13:09:09 Tue 03-Oct-17	QC Std 4		QC Std #4	
13:11:17 Tue 03-Oct-17	30146-4	x5	Sample	CAE
13:13:21 Tue 03-Oct-17	30146-5	x5	Sample	CAE
13:15:24 Tue 03-Oct-17	30146-6	x5	Sample	CAE
13:17:28 Tue 03-Oct-17	30146-3		Sample	CAE
13:19:33 Tue 03-Oct-17	30146-3	s	Spike - 1 of 96	CAE
13:23:41 Tue 03-Oct-17	QC Std 1		QC Std #1	
13:25:45 Tue 03-Oct-17	QC Std 2		QC Std #2	
13:27:49 Tue 03-Oct-17	QC Std 4		QC Std #4	

elementOne
Analyst:--DBW--

ICP-MS RUN SHEET
10/3/2017

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
403		30146-1	CAE	Sample		100x2
404		30146-2	CAE	Sample		100x2
405	d	30146-2	CAE	Duplicate of 3		100x2
406		30146-3	CAE	Sample		100x2
407	s	30146-3	CAE	Spike - 1 of 5		100x2
408		30146-4	CAE	Sample		100x2
409		30146-5	CAE	Sample		100x2
410		30146-6	CAE	Sample		100x2
411		30146-7	CAE	Sample		100x2
412		30146-8	CAE	Sample		100x2
8		QC Std 6		Sample		
9		QC Std 7		Sample		
401		LRB		Sample		100
402	s	LRB		Spike - 1 of 14		100
413	x5	30146-1	CAE	Sample		100x2
414	x5	30146-2	CAE	Sample		100x2
415	x5d	30146-2	CAE	Duplicate of 17		100x2
416	x5	30146-3	CAE	Sample		100x2
417	x5s	30146-3	CAE	Spike - 1 of 19		100x2
418	x10	30146-3	CAE	Sample		100x2
419	x10s	30146-3	CAE	Spike - 1 of 21		100x2
420	x5	30146-4	CAE	Sample		100x2
421	x5	30146-5	CAE	Sample		100x2
422	x5	30146-6	CAE	Sample		100x2
423		New IS Check		Sample		
424		30146-7	CAE	Sample		100x2
425		30146-7 FH	CAE	Sample		100
426		30146-7 BH undig	CAE	Sample		340
427		30146-8	CAE	Sample		100x2
428		30146-8 FH	CAE	Sample		100
429		30146-8 C8A	CAE	Sample		300
430		30146-8 C9	CAE	Sample		190
5		QC Std 2		Sample		
431	x50	30146-1	CAE	Sample		100x2
432	x50	30146-2	CAE	Sample		100x2
433	x50d	30146-2	CAE	Duplicate of 36		100x2
434	x50	30146-3	CAE	Sample		100x2
435	x50s	30146-3	CAE	Spike - 1 of 38		100x2
436	x50	30146-4	CAE	Sample		100x2
437	x50	30146-5	CAE	Sample		100x2
438	x50	30146-6	CAE	Sample		100x2
424		30146-7	CAE	Sample		100x2
425		30146-7 FH	CAE	Sample		100
426		30146-7 BH undig	CAE	Sample		340
427		30146-8	CAE	Sample		100x2
428		30146-8 FH	CAE	Sample		100
429		30146-8 C8A	CAE	Sample		300
430		30146-8 C9	CAE	Sample		190
413	x5	30146-1	CAE	Sample		100x2
414	x5	30146-2	CAE	Sample		100x2
415	x5d	30146-2	CAE	Duplicate of 51		100x2
416	x5	30146-3	CAE	Sample		100x2
417	x5s	30146-3	CAE	Spike - 1 of 53		100x2
420	x5	30146-4	CAE	Sample		100x2
421	x5	30146-5	CAE	Sample		100x2
422	x5	30146-6	CAE	Sample		100x2
406		30146-3	CAE	Sample		100x2
407	s	30146-3	CAE	Spike - 1 of 58		100x2

Spikes are post at 0.02mL of 25ppm spiking solutions lot 021417-ABC&F in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DBW	10/3/17 13:34		KLG	10/4/17 @ 1115	
Re-Test Required:	No: ✓	Yes:	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date/Time: Tuesday, October 03, 2017 09:12:38
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\100317-1a\Standard 3.004
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):

Autosampler Position: 4

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Be	Linear Thru Zero	0.005	0.999962	0.00
P	Linear Thru Zero	0.002	0.999985	0.00
Sc	Linear Thru Zero			
Cr	Linear Thru Zero	0.033	0.999992	0.00
Cr	Linear Thru Zero	0.004	0.999996	0.00
Co	Linear Thru Zero	0.043	0.999994	0.00
Ni	Linear Thru Zero	0.009	0.999995	0.00
Cu	Linear Thru Zero	0.021	0.999973	0.00
Cu	Linear Thru Zero	0.010	0.999995	0.00
Zn	Linear Thru Zero	0.006	0.999998	0.00
Zn	Linear Thru Zero	0.001	0.999989	0.00
Zn	Linear Thru Zero	0.005	1.000000	0.00
As	Linear Thru Zero	0.005	0.999999	0.00
Se	Linear Thru Zero	0.000	0.999986	0.00
Se	Linear Thru Zero	0.001	0.999993	0.00
Rh	Linear Thru Zero			
Ag	Linear Thru Zero	0.021	0.999853	0.00
Ag	Linear Thru Zero			
Cd	Linear Thru Zero	0.005	0.999999	0.00
Cd	Linear Thru Zero	0.011	0.999997	0.00
Sb	Linear Thru Zero			
Sb	Linear Thru Zero	0.011	0.999990	0.00
Ba	Linear Thru Zero			
Ba	Linear Thru Zero	0.006	0.999975	0.00
Ho	Linear Thru Zero			
Tl	Linear Thru Zero	0.024	0.999987	0.00
Pb	Linear Thru Zero	0.032	0.999993	0.00
Kr	Linear Thru Zero			

Method 6020 & 200.8 Metals Summary Report

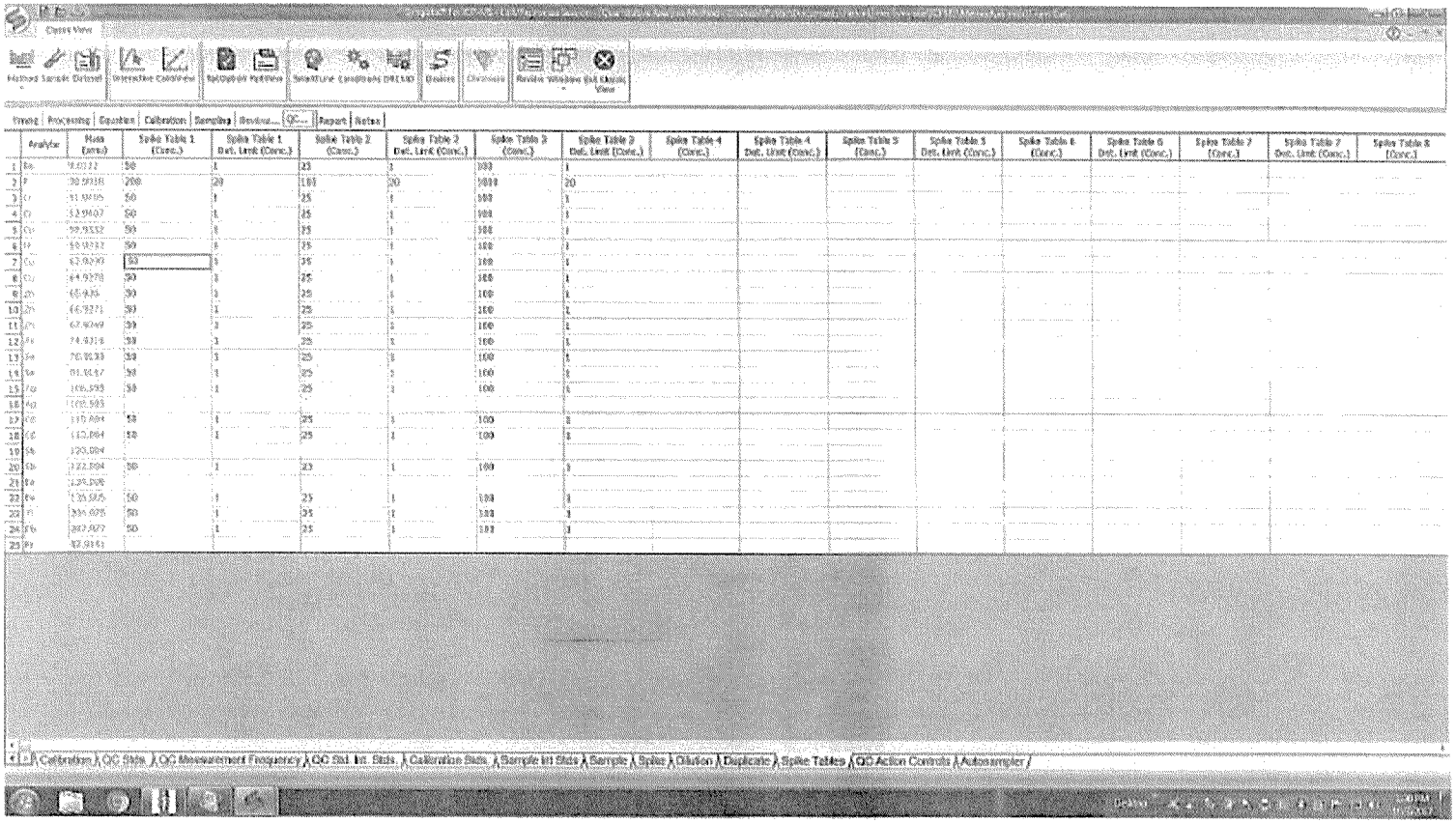
Sample ID: QC Std 1

Sample Date/Time: Tuesday, October 03, 2017 13:07:05
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\100317-1a\QC Std 1.091
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):

Autosampler Position: 1

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Be	Linear Thru Zero			
P	Linear Thru Zero			
Sc	Linear Thru Zero			
Cr	Linear Thru Zero			
Cr	Linear Thru Zero			
Co	Linear Thru Zero			
Ni	Linear Thru Zero			
Cu	Linear Thru Zero	0.021	1.000000	0.00
Cu	Linear Thru Zero	0.010	0.999994	0.00
Zn	Linear Thru Zero	0.006	0.999987	0.00
Zn	Linear Thru Zero	0.001	0.999985	0.00
Zn	Linear Thru Zero	0.005	0.999999	0.00
As	Linear Thru Zero	0.005	0.999995	0.00
Se	Linear Thru Zero			
Se	Linear Thru Zero	0.001	1.000000	0.00
Rh	Linear Thru Zero			
Ag	Linear Thru Zero			
Ag	Linear Thru Zero			
Cd	Linear Thru Zero			
Cd	Linear Thru Zero			
Sb	Linear Thru Zero			
Sb	Linear Thru Zero			
Ba	Linear Thru Zero			
Ba	Linear Thru Zero			
Ho	Linear Thru Zero			
Tl	Linear Thru Zero			
Pb	Linear Thru Zero	0.031	0.999959	0.00
Kr	Linear Thru Zero			



	Analyte	Mass (amu)	Spike Table 1 (Conc.)	Spike Table 1 Det. Limit (Conc.)	Spike Table 2 (Conc.)	Spike Table 2 Det. Limit (Conc.)	Spike Table 3 (Conc.)	Spike Table 3 Det. Limit (Conc.)	Spike Table 4 (Conc.)	Spike Table 4 Det. Limit (Conc.)	Spike Table 5 (Conc.)	Spike Table 5 Det. Limit (Conc.)	Spike Table 6 (Conc.)	Spike Table 6 Det. Limit (Conc.)	Spike Table 7 (Conc.)	Spike Table 7 Det. Limit (Conc.)	Spike Table 8 (Conc.)
1	Be	9.0122	50	1	25	1	100	1									
2	P	30.9738	200	20	100	20	1000	20									
3	Cr	51.9616	50	1	25	1	100	1									
4	Cr	52.9407	50	1	25	1	100	1									
5	Cu	59.9332	50	1	25	1	100	1									
6	Ni	59.9332	50	1	25	1	100	1									
7	Cu	62.9299	50	1	25	1	100	1									
8	Cu	64.9278	50	1	25	1	100	1									
9	Zn	65.926	50	1	25	1	100	1									
10	Zn	66.9271	50	1	25	1	100	1									
11	Zn	67.9249	50	1	25	1	100	1									
12	Zn	69.9218	50	1	25	1	100	1									
13	As	74.9216	50	1	25	1	100	1									
14	Se	76.9199	50	1	25	1	100	1									
15	Se	78.9187	50	1	25	1	100	1									
16	Se	80.9179	50	1	25	1	100	1									
17	Se	81.9167															
18	Se	82.9165	50	1	25	1	100	1									
19	Se	83.9166	50	1	25	1	100	1									
20	Se	85.9142															
21	Ag	106.9055	50	1	25	1	100	1									
22	Ag	108.9047	50	1	25	1	100	1									
23	Cd	109.9030															
24	Cd	111.9028	50	1	25	1	100	1									
25	Cd	112.9044															

ICP-MS QC Values Table

Element or Test	ICP Element Mass	Element symbol	Lowest Reported Value	Upper Reported Value	Reporting Unit	QC #1	QC #2	QC #3	QC #4	QC #5	QC #6 A	QC #7 AB	QC #8 .25	QC #9 LRB	QC #10 LRB+	QC #11 LRB+
Lithium	6	*Li*														
Lithium	7	Li	1	500	µg/L	0	1	250	100	50				0	50	100
Beryllium	9	Be	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Boron	10	*B*	5	500	µg/L	0	1	250	100	50				0	50	100
Boron	11	B	5	500	µg/L	0	1	250	100	50				0	50	100
Sodium	23	Na	20	5500	µg/L	0	21	2500	1100	250	5000	5000		0	718	
Magnesium	24	Mg	20	5500	µg/L	0	21	2500	1100	250	5000	5000		0	550	
Magnesium	25	*Mg*	20	5500	µg/L	0	21	2500	1100	250				0	550	
Aluminum	27	Al	1	500	µg/L	0	1	250	100	50	5000	5000		0	50	100
Phosphorus	31	P	20	5000	µg/L	0	20	2500	1000	250	5000	5000		0	200	
Potassium	39	K	20	5500	µg/L	0	20	2000	1000	200	5000	5000		0	500	
Calcium	44	Ca	50	5500	µg/L	0	21	2500	1100	250	5000	5000		0	550	
Scandium	45															
Titanium	47	Ti	1	500	µg/L	0	1	250	100	50	100	100	0.25	0	50	100
Titanium	49	Ti	1	500	µg/L	0	1	250	100	50	100	100	0.25	0	50	100
Vanadium	51	V	1	500	µg/L	0	1	250	100	50	0	2	0.25	0	50	100
Vanadium	51	V	1	500	µg/L	0	1	250	100	50	0	2	0.25	0	50	100
Chromium	52	Cr	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Chromium	53	*Cr*	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Iron	54	Fe	20	5500	µg/L	0	21	2500	1100	250	5000	0		0		
Manganese	55	Mn	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Iron	57	Fe	20	5500	µg/L	0	21	2500	1100	250	5000	0		0		
Cobalt	59	Co	1	500	µg/L	0	1	250	100	50	0	2	0.25	0	50	100
Nickel	60	Ni	1	500	µg/L	0	1	250	100	50	0	2	0.25	0	50	100
Copper	63	Cu	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Copper	65	Cu	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Zinc	66	Zn	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Zinc	67	Zn	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Zinc	68	Zn	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Germanium	72	Ge	1	500	µg/L	0	1	250	100	50				0	50	100
Arsenic	75	As	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Selenium	77	*Se*	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Selenium	82	Se	1	500	µg/L	0	1	250	100	50	0	1	0.25	0	50	100
Strontium	88	*Sr*	1	500	µg/L	0	1	250	100	50				0	50	100
Molybdenum	95	*Mo*	1	500	µg/L	0	1	250	100	50	100	100	0.25	0	50	100
Molybdenum	97	*Mo*	1	500	µg/L	0	1	250	100	50	100	100	0.25	0	50	100
Molybdenum	98	Mo	1	500	µg/L	0	1	250	100	50	100	100	0.25	0	50	100
Rhodium	103															
Silver	107	Ag	1	500	µg/L	0	1	250	100	50	0	1		0	50	100
Silver	109	*Ag*	1	500	µg/L	0	1	250	100	50				0	50	100
Cadmium	111	Cd	1	500	µg/L	0	1	250	100	50	0	0.5	0.25	0	50	100
Cadmium	114	*Cd*	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Tin	118	Sn	1	500	µg/L	0	1	250	100	50				0	50	100
Antimony	121	*Sb*	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Antimony	123	Sb	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Tellurium	126	Te	1	500	µg/L	0	1	250	100	50				0	50	100
Cesium	133															
Barium	135	*Ba*	1	500	µg/L	0	1	250	100	50				0	50	100
Barium	137	Ba	1	500	µg/L	0	1	250	100	50				0	50	100
Lanthanum	139	La	1	500	µg/L	0	1	250	100	50				0	50	100
Tantalum	159	Ta	1	500	µg/L	0	1	250	100	50				0	50	100
Platinum	195	Pt	1	500	µg/L	0	1	250	100	50				0	50	100
Gold	181	Au	1	500	µg/L	0	1	250	100	50				0	50	100
Thallium	205	Tl	1	500	µg/L	0	1	250	100	50				0	50	100
Lead	208	Pb	1	500	µg/L	0	1	250	100	50			0.25	0	50	100
Bismuth	209	Bi	1	500	µg/L	0	1	250	100	50				0	50	100
Thorium	232	Th	1	500	µg/L	0	1	250	100	50				0	50	100
Uranium	238	U	1	500	µg/L	0	1	250	100	50				0	50	100
Krypton	83															

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 09/25/17 Prep By: MMP SIF File #: 092617-1
Block #1 Temperature: 93.1 Start Time: 5:45a Machine ID: #2
Block #2 Temperature: — Stop Time: 8:00a Batch Analyst: MMP
Block #3 Temperature: ~95 Typed By: DKH Verified By: MMP

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: K2-HG0300a
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg2-141-1 by: DAM
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg2-141-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg2-141-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: MMP

Initial Review By: MMP Date: 9/26/17 Time: 2:01
Final QC Review By: LAW Date: 09.26.17 Time: 2:59
Comments: LRB4, LRB+, 30139-1BH @ 1mL, 30139-2BH @ 1mL, 30146-5B @ 1mL
30131-7 @ 0.2mL

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	29808-30QC	7470A			0.05	5	TV=9.70
10	L/L	↓			1	1	TV=0.008
✓11	30095-5TOT	7470A	0.5105/50	2	0.0204	1	
✓12	30131-7	M29			1	100	
13	-7				2		
14	-7				4		
15	LRB FH				4		
✓16	30131/-139-LRB FH+				1.6		
✓17	30139-1FH				4		
18	-2FHD						
19	-2FH	↓			↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.2ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 170476 *HNO_3 Lot #* 57082 *HCl Lot #:* 4116090
Persulfate Lot # Hg2-131-4 *$KMnO_4$ Lot #* Hg2-131-3 *Hydrox Lot#:* Hg2-125-5

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092617-1

A/S/	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
✓20	30139-2FH+	M29			4	100	
✓21	30131-1FH						
22	-2FH						
23	-2FHD						
24	-3FH						
25	-3FH+						
26	-4FH						
✓27	30129-1BH					360	
28	-1BHD					360	
29	-2BH					375	
30	-2BH+					375	
31	-1C					400	
32	-1CD						
33	-2C						
34	-2C+						
✓35	30146-1BH	M29			4	380	
36	-2BH					395	
37	-2BHD					395	
38	-3BH					410	
39	-3BH+					410	
40	-4BH					420	
41	-5BH					405	
42	-6BH					380	
43	-7BH					340	
44	-8BH					190	
45	-1A					200	
46	-2A						
47	-2AD						
48	-3A						
49	-3A+						
50	-4A						
51	-5A						
52	-6A						
53	-7A						
54	-8A						

Element One, Inc F209 R9

Page 2 of ~~6~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092617-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
55	30146-1B	M29			4	500	
56	-2B						
57	-2BD						
58	-3B						
59	-3B+						
60	-4B						
61	-5B						
62	-6B						
63	-7B						
64	-8B						
65							
66							
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Element One, Inc F209 R9

Page 3 of 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 092617 mmp Prep By: mmp SIF File #: 092717-1
Block #1 Temperature: 92.0 mid Start Time: 5:45a Machine ID: #1
Block #2 Temperature: — Stop Time: 8:00a Batch Analyst: mmp
Block #3 Temperature: ~95 Typed By: mmp Verified By: DKH

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: K2-HG-D3002
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg2-141-1 by: DAM
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg2-142-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg2-143-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: DKH

Initial Review By: mmp Date: 9/27/17 Time: 1:15
Final QC Review By: LMW Date: 09.27.17 Time: 1:55
Comments: 30139-2BH wrote dup instead of Spk on instrument 30146-3C@1mL 30146-4C@1mL 30146-5C@0.5mL 30146-6C@2mL

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	29808-30QC	7470A			0.05	5	TV=9.70
10	4L	↓			1	1	TV=0.008
11	30131/-139LCBFH	M29			4	100	
12	30131/-139LCBFH+				1.6		
13	30131-7				0.2		
14	-7D						
15	-7+				↓	↓	
16	30139-1BH				1	~~2~~ mmp 360	
17	-1BHD					360	
18	-2BH					375	
19	-2BH+	↓			↓	375	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.2ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 170476 *HNO_3 Lot #* 57052 *HCl Lot #:* H116090
Persulfate Lot # Hg2-131.4 *$KMnO_4$ Lot #* Hg2-131.7 *Hydrox Lot#:* Hg2-125.5

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092717-1

A/S✓	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
✓20	30150-1BH	M29			2	620	
21	-2BH					610	
22	-2BHD					610	
23	-3BH					645	
24	-3BH+					645	
25	-4BH				4	680	
26	-5BH					690	
27	-5BHD					690	
28	-6BH					710	
29	-6BH+					710	
30	-7BH					300	
31	-8BH					200	
32	-1A				4	200	
33	-2A						
34	-2AD						
35	-3A						
36	-3A+						
37	-4A						
38	-5A						
39	-5AD						
40	-6A						
41	-6A+						
42	-7A						
43	-8A						
44	-1B					500	
45	-2B						
46	-2BD						
47	-3B						
48	-3B+						
49	-4B						
50	-5B						
51	-5BD						
52	-6B						
53	-6B+						
54	-7B						

Element One, Inc F209 R9

Page 2 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092717-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
55	30150-8B	M29			4	500	
56	-1FH				0.1	100	
57	-2FH						
58	-2FHD						
59	-3FH						
60	-3FH+						
61	30146-1C				4	400	
62	-2C						
63	-2CD						
64	-3C						
65	-3C+						
66	-4C						
67	-5C						
68	-6C						
69	-7C						
70	-8C						
71	-5B	M29			1	500	
72	30133/-137/-142/-143	BLK 7470A			20	1	
73	BLK +						
74	30137-1						
75	-2						
76	-3						
77	-4						
78	30142-1						
79	-1D						
80	-2						
81	-2+						
82	30143-1						
83	-2						
84	-3						
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Element One, Inc F209 R9

Page 3 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

mmp

Date Prepared/Digested: 09/27/17 Prep By: mmp SIF File #: 092817-K2
Block #1 Temperature: 93° Start Time: 5:45a Machine ID: #2
Block #2 Temperature: — Stop Time: 8:00a Batch Analyst: mmp
Block #3 Temperature: 92.1° Typed By: mmp Verified By: KLG/DAM

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: K2-HG03002
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg2-141-1 by: DAM
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg2-141-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg2-141-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: mmp

Initial Review By: mmp Date: 9/28/17 Time: 12:30
Final QC Review By: KLG Date: 9/28/17 Time: 1530
Comments: 30133-34+ missed location 11, 12, 13 went back on end of run

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	29808-30QC	7470A			0.05	5	TV=9.70
10	4L				1	1	TV=0.008
11	30095/-158-TOT LRB				4	1	
12	30095/158-TOT LRB+				0.2	1	
13	30095-9TOT		.5107/50	4	.0408 9 KLG		
14	-9TOT D+ mmp		.5107/50		.0408 9		
15	-10TOT		.5010/50		.0400 1 KLG		
16	-10TOT +D mmp		.5010/50		.0400 1		
17	30158-TOT		.5023/50		.0401 2		
18	30153/-1-2-BLK				20		
19	-BLK+				20		

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.2ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 170476 *HNO_3 Lot #* 57052 *HCl Lot #:* 4116090

Persulfate Lot # Hg2-131-4 *$KMnO_4$ Lot #* Hg2-B1-7 *Hydrox Lot#:* Hg2-137-8

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092817-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
✓ 20	30153-1	7470A			20	1	
21	-2	↓			↓	↓	
✓ 22	30153/154/156-BLK						
23	-BLK+						
✓ 24	30133-1						
25	-2						
26	-2D						
27	-3						
28	-3+						
29	-4						
30	-5						
31	-6						
✓ 32	30153-3						
33	-4						
34	-5						
35	-6						
36	-7						
37	-8						
✓ 38	30154						
39	30154-D						
40	30156						
✓ 41	30156+						
42	30157						
✓ 43	30157-D						
44	30158						
✓ 45	30158-+	↓			↓	↓	
46	30155-2 1mm	7470A			20	1	
47	-2	↓			20	↓	
✓ 48	30150-1C	M29			4	400	
49	-2C						
50	-2CD						
51	-3C						
52	-3C+						
53	-4C						
54	-5C	↓			↓	↓	

Element One, Inc F209 R9

Page 2 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092817-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
√ 55	30150-5C D	~~7470~~ M29			4	400	
56	-6C						
57	-6C+						
58	-7C						
59	-8C						
60	30146-3C	M29				400	
61	-3C+						
62	-4C						
63	-5C				0.5		
64	-6C				2		
65							
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Element One, Inc F209 R9 Page 3 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 09/28/17 Prep By: MMP SIF File #: 092917-1
Block #1 Temperature: 92.1 Start Time: 5:45am Machine ID: #1
Block #2 Temperature: — Stop Time: 8:00am Batch Analyst: MMP
Block #3 Temperature: 93.4 Typed By: MMP Verified By: DKH

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: K2-HG03002
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg2-141-1 by: DAM
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg2-141-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg2-141-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: MMP

Initial Review By: MMP Date: 9/29/17 Time: 10:45
Final QC Review By: LAW Date: 09.29.17 Time: 4:03
Comments: 30146-LRB spk, 30164 TOT LRB+ @ ~~0.025~~ 0.2ml, 30164-TOT @ 2mL
30133-3spk @ 10 & 5mL

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	29808-30QC	7470A			0.05	5	TV=9.70
10	L/L	↓			1	1	TV=0.008
✓11	30146-LRB	M29			4	100	
12	-LRB+						spiked @ 0.2ug
13	-1FH						
14	-2FH						
15	-2FHD						
16	-3FH+ MMP						
17	-3FH+						
18	-4FH						
19	-5FH	↓			↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.2ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 170476 *HNO_3 Lot #* 57052 *HCl Lot #* 4116090
Persulfate Lot # Hg2-131-4 *$KMnO_4$ Lot #* Hg2-131-7 *Hydrox Lot#* Hg2-137-8

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of ~~6~~ 2

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 092917-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
20	30146-6FH	M29			4	100	
21	-7FH						
22	-8FH						
23	30164-TOTLRB				4	1	
24	-TOT DUP+				0.2		
25	-TOT		0.5001/50	4	~~0.0100~~ mmp		
26	-TOTD		0.5008/50	4	0.0401		
27	30164/165-BLK	7470A			20	1	
28	-BLK+						
29	30164						
30	30165-1						
31	-2						
32	-2D						
33	-3						
34	-3+						
35	-4						
36	-5						
37	-6						
38	-7						
39	30133-3						
40	-3+						
41	30153-1-2-BLK	7470A			20	1	
42	-BLK+						
43	30176-1				0.4		
44	-2						
45	-2D						
46	-3						
47	-4 mmp						
48	-4+						
49	~~-5~~ mmp						
50							
51							
52							
53							
54							

Element One, Inc F209 R9

Page 2 of ~~3~~ 2

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 10/02/17 Prep By: mmP SIF File #: 100217-1
Block #1 Temperature: 92.6° Start Time: 9:30 Machine ID: #2
Block #2 Temperature: — Stop Time: 10:35 Batch Analyst: mmP
Block #3 Temperature: — Typed By: mmP Verified By: KLG

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: K2-HG03002
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg2-143-1 by: mmP
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg2-143-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg2-143-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: mmP

Initial Review By: mmP Date: 10/2/17 Time: 12:15
Final QC Review By: LAW Date: 10-02-17 Time: 2:19
Comments:

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	298808-30QC	7470A			0.05	5	TV=9.70
10	L/C				1	1	TV=0.008
11	30177/178-BLK				20	1	
12	-BLK+						
13	30177-1						
14	-2						
15	-3						
16	-4						
17	-5						
18	30178-1						
19	-2						

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.2ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 170476 *HNO_3 Lot #* 57052 *HCl Lot #:* 411 6090
Persulfate Lot # Hg2-131-4 *$KMnO_4$ Lot #* Hg2-131-7 *Hydrox Lot#:* Hg2-137-8

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of 5

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 100217-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
✓ 20	30175-20	7470A			20	1	
21	-3						
22	-3+						
✓ 23	-4						
✓ 24	30133-3				10		
25	-3+				10		
26	-3-				5		
27	-3+				5		
✓ 28	30146-LRB	M 29			4	100	
29	-LRB+				1.6		
✓ 30	30164-LRB-TDT	7470A			4	1	
31	-LRBTDT+				0.2		TV = ~~1.0mg~~ 0.1mg
32	30164-TDT		0.5001/50	2	0.0200		
33	-TDT D		0.5009/50	2	0.0200		
34							
35							
36							
37							
38							
39							
40							
41							
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Element One, Inc F209 R9

Page 2 of 5

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Dat Tuesday, October 03, 2017 09:03:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1225589.5		ppb
|-	Be	9	31		ppb
|-	P	31	26850.2		ppb
|>	Sc	45	1917844		ppb
|	Cr	52	71286.9		ppb
|-	Cr	53	156922.1		ppb
|-	Co	59	264.3		ppb
|	Ni	60	332		ppb
|	Cu	63	1644.1		ppb
|	Cu	65	773.4		ppb
|	Zn	66	3616.1		ppb
|	Zn	67	3033.7		ppb
|	Zn	68	3828.2		ppb
|	As	75	-815.4		ppb
|	Se	77	11417.9		ppb
|	Se	82	138.8		ppb
|>	Rh	103	1751491.9		ppb
|	Ag	107	2304.2		ppb
|	Ag	109	2157.8		ppb
|	Cd	111	108.2		ppb
|-	Cd	114	263.9		ppb
|-	Sb	121	478.3		ppb
|	Sb	123	358.4		ppb
|	Ba	135	97		ppb
|	Ba	137	155.3		ppb
|>	Ho	165	1590395.8		ppb
|	Tl	205	398.7		ppb
|-	Pb	208	2877.8		ppb
	Kr	83	111.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Dat Tuesday, October 03, 2017 09:06:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1265009.7		ppb
|-	Be	9	6467.8	1	ppb
|-	P	31	98476.2	20	ppb
|>	Sc	45	1910457		ppb
|	Cr	52	140121.8	1	ppb
|-	Cr	53	171430	1	ppb
|-	Co	59	77556.7	1	ppb
|	Ni	60	16255.2	1	ppb
|	Cu	63	38740.1	0.99941	ppb
|	Cu	65	17885.2	0.99947	ppb
|	Zn	66	14890.8	1.0149	ppb
|	Zn	67	5033.6	1.12131	ppb
|	Zn	68	11941	0.99396	ppb
|	As	75	8378.5	0.97539	ppb
|	Se	77	12552.2	1	ppb
|	Se	82	1105.5	0.93663	ppb
|>	Rh	103	1750245.4		ppb
|	Ag	107	40511	1	ppb
|	Ag	109	38056		ppb
|	Cd	111	8742	1	ppb
|-	Cd	114	20340.8	1	ppb
|-	Sb	121	23591.8		ppb
|	Sb	123	17609.6	1	ppb
|	Ba	135	6121.3		ppb
|	Ba	137	10507.5	1	ppb
|>	Ho	165	1567320.2		ppb
|	Tl	205	39125.5	1	ppb
|-	Pb	208	53804.8	1.05003	ppb
	Kr	83	116.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample Dat Tuesday, October 03, 2017 09:09:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1287547.5		ppb
|-	Be	9	655319.8	100	ppb
|-	P	31	3800097	1000.0001	ppb
|>	Sc	45	2008072.1		ppb
|	Cr	52	6816115.9	99.99923	ppb
|-	Cr	53	931349	99.98931	ppb
|-	Co	59	7798123.1	99.99994	ppb
|	Ni	60	1607727.2	99.99995	ppb
|	Cu	63	3830745.6	101.60185	ppb
|	Cu	65	1752712.9	100.88432	ppb
|	Zn	66	1142659.7	101.07623	ppb
|	Zn	67	187977.2	102.09398	ppb
|	Zn	68	825384.1	99.14056	ppb
|	As	75	945081.8	98.85049	ppb
|	Se	77	94662.8	99.99603	ppb
|	Se	82	104189	99.36777	ppb
|>	Rh	103	1775821		ppb
|	Ag	107	4139470.3	100.00063	ppb
|	Ag	109	3872923.2		ppb
|	Cd	111	866547.3	99.99989	ppb
|-	Cd	114	2013966.9	99.99988	ppb
|-	Sb	121	2365709.4		ppb
|	Sb	123	1729414.6	99.99985	ppb
|	Ba	135	609568.8		ppb
|	Ba	137	1036096.8	99.99984	ppb
|>	Ho	165	1593616		ppb
|	Tl	205	3920632.3	99.99995	ppb
|-	Pb	208	5167092.3	104.63182	ppb
	Kr	83	137.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Dat Tuesday, October 03, 2017 09:12:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1145205.5		ppb
|-	Be	9	2786813.3	499.12442	ppb
|-	P	31	17458491	4994.4685	ppb
|>	Sc	45	1909906.5		ppb
|	Cr	52	31455735.1	499.58889	ppb
|-	Cr	53	3839852.2	500.17982	ppb
|-	Co	59	35998739	499.65905	ppb
|	Ni	60	7435298.5	499.69552	ppb
|	Cu	63	17326475.2	499.2598	ppb
|	Cu	65	8105945.3	499.69917	ppb
|	Zn	66	5304382.6	499.81504	ppb
|	Zn	67	850953.2	499.52892	ppb
|	Zn	68	3860121.5	499.98109	ppb
|	As	75	4472527.9	500.12084	ppb
|	Se	77	390781.7	499.46812	ppb
|	Se	82	479588.5	499.6213	ppb
|>	Rh	103	1669024.4		ppb
|	Ag	107	17842708.5	498.28309	ppb
|	Ag	109	16954962.9		ppb
|	Cd	111	4099126	500.12996	ppb
|-	Cd	114	9350068.9	499.77091	ppb
|-	Sb	121	11089621.5		ppb
|	Sb	123	8399788.9	499.55272	ppb
|	Ba	135	2941136.4		ppb
|	Ba	137	4964697.3	499.28657	ppb
|>	Ho	165	1584226.8		ppb
|	Tl	205	18984623.4	499.49543	ppb
|-	Pb	208	25167367.2	499.61529	ppb
	Kr	83	190.7		ppb

Method 6020 & 200.8 Metals Summary Report

PerkinElmer ELAN 6100 ICP-MS

Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 09:15:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1347638.5		ppb
|-	Be	9	974	0.14473	ppb
|-	P	31	35041.3	1.50166	ppb
|>	Sc	45	2095012.3		ppb
|	Cr	52	121108.4	0.62781	ppb
|-	Cr	53	110782.9	-7.519	ppb
|-	Co	59	11601.5	0.14327	ppb
|	Ni	60	2739.6	0.14649	ppb
|	Cu	63	7493.4	0.15158	ppb
|	Cu	65	3375.1	0.14409	ppb
|	Zn	66	5519.7	0.14869	ppb
|	Zn	67	2262.2	-0.49125	ppb
|	Zn	68	5173.6	0.13719	ppb
|	As	75	-150.5	0.07072	ppb
|	Se	77	14930.5	3.54	ppb
|	Se	82	354.4	0.1979	ppb
|>	Rh	103	1835761.9		ppb
|	Ag	107	26824.3	0.62003	ppb
|	Ag	109	22576.2		ppb
|	Cd	111	1244.3	0.12575	ppb
|-	Cd	114	3045.6	0.13487	ppb
|-	Sb	121	3263.1		ppb
|	Sb	123	2457.7	0.1236	ppb
|	Ba	135	960		ppb
|	Ba	137	1527.4	0.13667	ppb
|>	Ho	165	1602520.1		ppb
|	Tl	205	5445.1	0.13151	ppb
|-	Pb	208	9968.8	0.13911	ppb
	Kr	83	123.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 09:18:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1368825.2		ppb
|-	Be	9	7448.9	1.11097	ppb
|-	P	31	121117.3	23.5218	ppb
|>	Sc	45	2125632.5		ppb
|	Cr	52	186905.8	1.54329	ppb
|-	Cr	53	130532.7	-5.29758	ppb
|-	Co	59	88476.5	1.09874	ppb
|	Ni	60	18815	1.11371	ppb
|	Cu	63	44135.7	1.09656	ppb
|	Cu	65	20397.2	1.08334	ppb
|	Zn	66	16924.7	1.10751	ppb
|	Zn	67	4402.7	0.62446	ppb
|	Zn	68	13505.4	1.09874	ppb
|	As	75	9111.4	1.00104	ppb
|	Se	77	15330.6	3.78803	ppb
|	Se	82	1278.8	1.05847	ppb
|>	Rh	103	1859587.2		ppb
|	Ag	107	47675.1	1.13377	ppb
|	Ag	109	44546.7		ppb
|	Cd	111	9460.4	1.02355	ppb
|-	Cd	114	22329.4	1.05781	ppb
|-	Sb	121	24896.7		ppb
|	Sb	123	18791.1	1.07193	ppb
|	Ba	135	6753.3		ppb
|	Ba	137	11409.6	1.10685	ppb
|>	Ho	165	1619355		ppb
|	Tl	205	41247.1	1.05109	ppb
|-	Pb	208	55785.8	1.0265	ppb
	Kr	83	119.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3

PerkinElmer ELAN 6100 ICP-MS

Sample Dat Tuesday, October 03, 2017 09:21:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1241721		ppb
|-	Be	9	1537548.9	253.98063	ppb
|-	P	31	9296271.5	2576.6395	ppb
|>	Sc	45	1968554.6		ppb
|	Cr	52	16465506.9	253.15601	ppb
|-	Cr	53	2086174.6	253.59882	ppb
|-	Co	59	18353655.2	251.3873	ppb
|	Ni	60	3893653.7	258.24806	ppb
|	Cu	63	9188416.9	261.30636	ppb
|	Cu	65	4206203.8	255.85739	ppb
|	Zn	66	2750266.9	255.53626	ppb
|	Zn	67	439161.7	253.57717	ppb
|	Zn	68	1921337.2	245.34805	ppb
|	As	75	2294629.4	253.22859	ppb
|	Se	77	207536.9	255.00798	ppb
|	Se	82	246699.4	253.5719	ppb
|>	Rh	103	1691939.4		ppb
|	Ag	107	9603278.5	264.60423	ppb
|	Ag	109	8958792.5		ppb
|	Cd	111	2013040.1	242.37875	ppb
|-	Cd	114	4712723.1	248.57948	ppb
|-	Sb	121	5415422.4		ppb
|	Sb	123	4114081.1	253.90522	ppb
|	Ba	135	1381525.8		ppb
|	Ba	137	2454059.2	256.05231	ppb
|>	Ho	165	1526746.5		ppb
|	Tl	205	9092082.7	248.20328	ppb
|-	Pb	208	12182818.7	250.94148	ppb
	Kr	83	163.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 09:24:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1320901.6		ppb
|-	Be	9	671823.2	104.32323	ppb
|-	P	31	4026096.2	1034.6901	ppb
|>	Sc	45	2113676.6		ppb
|	Cr	52	7191194.6	102.29891	ppb
|-	Cr	53	953415.7	95.754	ppb
|-	Co	59	8305765.3	107.31482	ppb
|	Ni	60	1678423.4	104.99131	ppb
|	Cu	63	3997133.5	107.17772	ppb
|	Cu	65	1804007.8	103.47646	ppb
|	Zn	66	1180370	103.27774	ppb
|	Zn	67	193324.4	104.31174	ppb
|	Zn	68	850775.3	102.21261	ppb
|	As	75	971104.8	101.17122	ppb
|	Se	77	98339.7	106.04528	ppb
|	Se	82	107279.3	103.91345	ppb
|>	Rh	103	1793085.7		ppb
|	Ag	107	4215847.7	109.54043	ppb
|	Ag	109	3855912.8		ppb
|	Cd	111	853363.8	96.91104	ppb
|-	Cd	114	2053709.1	102.1659	ppb
|-	Sb	121	2385578.3		ppb
|	Sb	123	1733697.2	102.70029	ppb
|	Ba	135	604418.6		ppb
|	Ba	137	1022704.8	102.45922	ppb
|>	Ho	165	1590079.2		ppb
|	Tl	205	3948696.6	103.48509	ppb
|-	Pb	208	5128049.2	101.37456	ppb
	Kr	83	147		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample Dat Tuesday, October 03, 2017 09:27:56

PerkinElmer ELAN 6100 ICP-MS

Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1393436.4		ppb
|-	Be	9	352073	51.8201	ppb
|-	P	31	843392.4	204.66051	ppb
|>	Sc	45	2173845		ppb
|	Cr	52	3852068.6	52.74437	ppb
|-	Cr	53	544838.5	43.79475	ppb
|-	Co	59	4176897.3	52.49292	ppb
|	Ni	60	866053.5	52.69044	ppb
|	Cu	63	2023678.1	52.77365	ppb
|	Cu	65	942279.4	52.56054	ppb
|	Zn	66	608740.4	51.65366	ppb
|	Zn	67	99820.5	51.54468	ppb
|	Zn	68	437936.2	50.94855	ppb
|	As	75	499147.4	50.63032	ppb
|	Se	77	58681.6	55.57179	ppb
|	Se	82	55511.8	52.24695	ppb
|>	Rh	103	1842878.9		ppb
|	Ag	107	1973699.5	49.85918	ppb
|	Ag	109	1848677.8		ppb
|	Cd	111	439680.7	48.56847	ppb
|-	Cd	114	1007131.6	48.73452	ppb
|-	Sb	121	1160708.7		ppb
|	Sb	123	877807	51.89569	ppb
|	Ba	135	299746.2		ppb
|	Ba	137	512824.2	51.27629	ppb
|>	Ho	165	1592917.9		ppb
|	Tl	205	1802578	47.15107	ppb
|-	Pb	208	2492256.9	49.14741	ppb
	Kr	83	125.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample Dat Tuesday, October 03, 2017 09:30:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1357492.3		ppb
|-	Be	9	432	0.06006	ppb
|-	P	31	3832331.2	990.70551	ppb
|>	Sc	45	2100630.4		ppb
|	Cr	52	112959.3	0.50497	ppb
|-	Cr	53	109475.4	-7.70498	ppb
|-	Co	59	5202.7	0.06316	ppb
|	Ni	60	1677.8	0.08278	ppb
|	Cu	63	7860.5	0.16382	ppb
|	Cu	65	3591.5	0.15882	ppb
|	Zn	66	6330.7	0.22559	ppb
|	Zn	67	2463.9	-0.36456	ppb
|	Zn	68	5658.1	0.20352	ppb
|	As	75	-898.1	-0.0058	ppb
|	Se	77	14282.8	3.01084	ppb
|	Se	82	159	0.01492	ppb
|>	Rh	103	1809951.3		ppb
|	Ag	107	489685.3	12.55019	ppb
|	Ag	109	455607.1		ppb
|	Cd	111	621.8	0.05745	ppb
|-	Cd	114	1391	0.05519	ppb
|-	Sb	121	1479.1		ppb
|	Sb	123	1117	0.04652	ppb
|	Ba	135	458		ppb
|	Ba	137	774	0.06376	ppb
|>	Ho	165	1557475		ppb
|	Tl	205	2455.9	0.05543	ppb
|-	Pb	208	53131.5	1.01631	ppb
	Kr	83	130		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample Dat Tuesday, October 03, 2017 09:34:03
Sample Description:

PerkinElmer ELAN 6100 ICP-MS

Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1473010.9		ppb
|-	Be	9	181	0.01994	ppb
|-	P	31	27471137	6331.5046	ppb
|>	Sc	45	2371766.6		ppb
|	Cr	52	204243.1	1.48793	ppb
|-	Cr	53	134395.9	-6.52257	ppb
|-	Co	59	240221.9	2.79689	ppb
|	Ni	60	58298.7	3.26977	ppb
|	Cu	63	80582.3	1.90544	ppb
|	Cu	65	34658.3	1.7493	ppb
|	Zn	66	37665.9	2.65813	ppb
|	Zn	67	9937.5	3.21415	ppb
|	Zn	68	25623.6	2.31767	ppb
|	As	75	12431.9	1.25452	ppb
|	Se	77	16155.8	3.53867	ppb
|	Se	82	1619.3	1.27962	ppb
|>	Rh	103	1986803.5		ppb
|	Ag	107	3314206.5	77.69541	ppb
|	Ag	109	3101726.9		ppb
|	Cd	111	6552.3	0.65897	ppb
|-	Cd	114	16042.8	0.70688	ppb
|-	Sb	121	846.7		ppb
|	Sb	123	614.5	0.01047	ppb
|	Ba	135	1410.1		ppb
|	Ba	137	2338.9	0.18837	ppb
|>	Ho	165	1827363.9		ppb
|	Tl	205	1084.4	0.0143	ppb
|-	Pb	208	8299.9	0.08597	ppb
	Kr	83	143.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample Dat Tuesday, October 03, 2017 09:37:07
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	2305752.2		ppb
|-	Be	9	2933	0.25578	ppb
|-	P	31	58335.4	1.3185	ppb
|>	Sc	45	3557139.7		ppb
|	Cr	52	169946.3	0.32219	ppb
|-	Cr	53	262740.3	-2.07037	ppb
|-	Co	59	36113.6	0.26794	ppb
|	Ni	60	11752.8	0.4065	ppb
|	Cu	63	24810.9	0.34204	ppb
|	Cu	65	11584	0.34129	ppb
|	Zn	66	22598.5	0.82903	ppb
|	Zn	67	7212.2	0.59747	ppb
|	Zn	68	16928.7	0.7156	ppb
|	As	75	2018.3	0.20935	ppb
|	Se	77	26093.8	4.27228	ppb
|	Se	82	514.4	0.15249	ppb
|>	Rh	103	3081836.5		ppb
|	Ag	107	8129	0.06165	ppb
|	Ag	109	7469.3		ppb
|	Cd	111	3631.2	0.22739	ppb
|-	Cd	114	8364.8	0.22871	ppb
|-	Sb	121	9849.4		ppb
|	Sb	123	7393.9	0.24022	ppb
|	Ba	135	623.7		ppb
|	Ba	137	1058.7	0.04775	ppb
|>	Ho	165	2664493.7		ppb
|	Tl	205	14982.5	0.22392	ppb
|-	Pb	208	24250.8	0.22935	ppb
	Kr	83	124.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 9
Sample Dat Tuesday, October 03, 2017 09:40:11
Sample Description:
Concentration Results

PerkinElmer ELAN 6100 ICP-MS

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1206609.2		ppb
|-	Be	9	94	0.01086	ppb
|-	P	31	142320.7	33.68886	ppb
|>	Sc	45	1883400.6		ppb
|	Cr	52	98983.2	0.46769	ppb
|-	Cr	53	13940.5	-19.29947	ppb
|-	Co	59	3044.4	0.03793	ppb
|	Ni	60	7854.5	0.49468	ppb
|	Cu	63	30650.9	0.8181	ppb
|	Cu	65	14033.6	0.80013	ppb
|	Zn	66	37688	3.14763	ppb
|	Zn	67	5887.2	1.68617	ppb
|	Zn	68	27955.3	3.06912	ppb
|	As	75	-399.5	0.04336	ppb
|	Se	77	1034.7	-12.97435	ppb
|	Se	82	52.9	-0.0839	ppb
|>	Rh	103	1707831.5		ppb
|	Ag	107	5224.6	0.0814	ppb
|	Ag	109	4571.7		ppb
|	Cd	111	405.4	0.03588	ppb
|-	Cd	114	780.4	0.02741	ppb
|-	Sb	121	2246.5		ppb
|	Sb	123	1733.2	0.07632	ppb
|	Ba	135	1987.8		ppb
|	Ba	137	3426.1	0.31045	ppb
|>	Ho	165	1674555.7		ppb
|	Tl	205	983.1	0.01408	ppb
|-	Pb	208	7906.2	0.09165	ppb
	Kr	83	100.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 10
Sample Dat Tuesday, October 03, 2017 09:43:15
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1227629.5		ppb
|-	Be	9	206553.3	34.50981	ppb
|-	P	31	593741.4	160.69421	ppb
|>	Sc	45	1929977.9		ppb
|	Cr	52	3263223.2	50.26992	ppb
|-	Cr	53	383032.5	30.25117	ppb
|-	Co	59	3538704.5	46.82445	ppb
|	Ni	60	699771.1	44.82195	ppb
|	Cu	63	1590811.3	43.6699	ppb
|	Cu	65	750132.3	44.05102	ppb
|	Zn	66	321451.8	28.57605	ppb
|	Zn	67	54966.2	29.16963	ppb
|	Zn	68	243232.2	29.59629	ppb
|	As	75	277697.3	29.69389	ppb
|	Se	77	19687.6	10.37914	ppb
|	Se	82	23830.2	23.54087	ppb
|>	Rh	103	1750201.3		ppb
|	Ag	107	1807167.7	48.06819	ppb
|	Ag	109	1719089.1		ppb
|	Cd	111	302416.4	35.17237	ppb
|-	Cd	114	691881.8	35.25061	ppb
|-	Sb	121	882446.4		ppb
|	Sb	123	671734.4	36.25608	ppb
|	Ba	135	315462.4		ppb
|	Ba	137	539693.9	49.27198	ppb
|>	Ho	165	1744448.4		ppb
|	Tl	205	1894093.9	45.24175	ppb
|-	Pb	208	2619722.2	47.17472	ppb
	Kr	83	107.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 09:46:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit

|>	Li	6	1238773.5		ppb
|-	Be	9	6512.5	1.07314	ppb
|-	P	31	109880.1	23.16203	ppb
|>	Sc	45	1950603.8		ppb
|	Cr	52	150014.3	1.20811	ppb
|-	Cr	53	124850.9	-4.62732	ppb
|-	Co	59	79548.2	1.09458	ppb
|	Ni	60	17000.1	1.11531	ppb
|	Cu	63	39472.5	1.08518	ppb
|	Cu	65	17820.5	1.04538	ppb
|	Zn	66	14996.9	1.07798	ppb
|	Zn	67	4195.6	0.75333	ppb
|	Zn	68	11774.2	1.0423	ppb
|	As	75	7932.3	0.96533	ppb
|	Se	77	12305.7	1.73354	ppb
|	Se	82	1071.1	0.96933	ppb
|>	Rh	103	1682820.2		ppb
|	Ag	107	42609.9	1.11943	ppb
|	Ag	109	39858		ppb
|	Cd	111	8649.7	1.0357	ppb
|-	Cd	114	19821.3	1.0385	ppb
|-	Sb	121	23059.3		ppb
|	Sb	123	17300.8	1.07496	ppb
|	Ba	135	6084.3		ppb
|	Ba	137	10152.6	1.07282	ppb
|>	Ho	165	1488714		ppb
|	Tl	205	37159.7	1.03121	ppb
|-	Pb	208	50753.2	1.01683	ppb
	Kr	83	252.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-1
Sample Dat Tuesday, October 03, 2017 09:49:24
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1347018.6		ppb
|-	Be	9	286.3	0.03841	ppb
|-	P	31	703397.5	173.95826	ppb
|>	Sc	45	2119391.9		ppb
|	Cr	52	3042932.7	42.51733	ppb
|-	Cr	53	356868.9	22.44699	ppb
|-	Co	59	300037.8	3.8103	ppb
|	Ni	60	595718.5	36.64872	ppb
|	Cu	63	1967328	51.88191	ppb
|	Cu	65	919587	51.88034	ppb
|	Zn	66	24714770.1	2134.0792	ppb
|	Zn	67	3717552.7	2003.9901	ppb
|	Zn	68	17017199.5	2020.3791	ppb
|	As	75	13260.1	1.44465	ppb
|	Se	77	10023.8	-2.23288	ppb
|	Se	82	12092.3	11.4032	ppb
|>	Rh	103	1822117		ppb
|	Ag	107	89785.3	2.23549	ppb
|	Ag	109	80840.4		ppb
|	Cd	111	51847.8	5.78165	ppb
|-	Cd	114	104974	5.12581	ppb
|-	Sb	121	145228.6		ppb
|	Sb	123	110411	5.63884	ppb
|	Ba	135	411908.8		ppb
|	Ba	137	706229.4	61.20243	ppb
|>	Ho	165	1837913.7		ppb
|	Tl	205	4349.3	0.08818	ppb
|-	Pb	208	6499023.7	111.16059	ppb
	Kr	83	159		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 09:52:28
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1306182.1		ppb

|-	Be	9	251.7	0.03433	ppb
|-	P	31	764694.8	190.201	ppb
|>	Sc	45	2115043.1		ppb
|	Cr	52	2589930.4	36.09621	ppb
|-	Cr	53	299986.7	15.56327	ppb
|-	Co	59	279027.8	3.66056	ppb
|	Ni	60	460569.5	29.26731	ppb
|	Cu	63	2016669.6	54.94395	ppb
|	Cu	65	942409.4	54.92911	ppb
|	Zn	66	17920749.1	1598.5566	ppb
|	Zn	67	2730710.4	1520.3161	ppb
|	Zn	68	12402339.8	1521.0523	ppb
|	As	75	8390	0.97459	ppb
|	Se	77	5644.1	-7.28198	ppb
|	Se	82	6417.3	6.18999	ppb
|>	Rh	103	1763714.2		ppb
|	Ag	107	52111.9	1.31591	ppb
|	Ag	109	46205.6		ppb
|	Cd	111	41022	4.72376	ppb
|-	Cd	114	84255.6	4.24826	ppb
|-	Sb	121	116920.9		ppb
|	Sb	123	88231.8	4.7173	ppb
|	Ba	135	388637.8		ppb
|	Ba	137	657269.6	59.67613	ppb
|>	Ho	165	1754219.6		ppb
|	Tl	205	3266.4	0.06715	ppb
|-	Pb	208	6729844.3	120.59825	ppb
	Kr	83	156.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 09:55:32
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1271610.1		ppb
|-	Be	9	217	0.02981	ppb
|-	P	31	762387.4	192.71581	ppb
|>	Sc	45	2081963.1		ppb
|	Cr	52	2599779	36.83385	ppb
|-	Cr	53	298526.6	15.96799	ppb
|-	Co	59	276283.5	3.71035	ppb
|	Ni	60	459280.6	29.87692	ppb
|	Cu	63	1969473.6	54.92987	ppb
|	Cu	65	926015.7	55.25066	ppb
|	Zn	66	17969545.7	1640.767	ppb
|	Zn	67	2712933.2	1546.122	ppb
|	Zn	68	12389020.7	1555.2046	ppb
|	As	75	8510.6	1.00841	ppb
|	Se	77	5551.4	-7.2337	ppb
|	Se	82	6400.6	6.3226	ppb
|>	Rh	103	1723026		ppb
|	Ag	107	45767.5	1.1768	ppb
|	Ag	109	40356.9		ppb
|	Cd	111	40442.4	4.76721	ppb
|-	Cd	114	83555.8	4.312	ppb
|-	Sb	121	117705		ppb
|	Sb	123	87708.4	4.82795	ppb
|	Ba	135	380661.1		ppb
|	Ba	137	650499.7	60.80299	ppb
|>	Ho	165	1703986.8		ppb
|	Tl	205	3058.7	0.06436	ppb
|-	Pb	208	6653031.6	122.73546	ppb
	Kr	83	159.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 09:58:35
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1274625.6		ppb
|-	Be	9	291.3	0.0417	ppb

|-	P	31	971993	248.12357	ppb
|>	Sc	45	2079585.3		ppb
|	Cr	52	4417591.9	63.44887	ppb
|-	Cr	53	512003.4	42.63037	ppb
|-	Co	59	441528.6	5.9108	ppb
|	Ni	60	651560.4	42.24346	ppb
|	Cu	63	3327225.8	92.50036	ppb
|	Cu	65	1502352.6	89.34711	ppb
|	Zn	66	32769986.3	2981.8484	ppb
|	Zn	67	4904230.1	2786.4983	ppb
|	Zn	68	22604524.6	2828.2629	ppb
|	As	75	14537.6	1.65586	ppb
|	Se	77	9057.5	-2.8096	ppb
|	Se	82	10976	10.90183	ppb
|>	Rh	103	1729064.6		ppb
|	Ag	107	73003.1	1.9067	ppb
|	Ag	109	64526.4		ppb
|	Cd	111	86021.2	10.11827	ppb
|-	Cd	114	175547.3	9.04335	ppb
|-	Sb	121	200110.9		ppb
|	Sb	123	151044.8	8.13392	ppb
|	Ba	135	636569.3		ppb
|	Ba	137	1083816.8	98.9456	ppb
|>	Ho	165	1744797.5		ppb
|	Tl	205	4235.3	0.09072	ppb
|-	Pb	208	14371608.9	259.00513	ppb
	Kr	83	176.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 10:01:39
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1269786		ppb
|-	Be	9	193775.4	31.30044	ppb
|-	P	31	1388728	364.4416	ppb
|>	Sc	45	2042903.7		ppb
|	Cr	52	7627866.5	112.38297	ppb
|-	Cr	53	887800.6	91.49754	ppb
|-	Co	59	4148786.4	56.62079	ppb
|	Ni	60	1348025.7	89.08057	ppb
|	Cu	63	4813961.9	136.38561	ppb
|	Cu	65	2265898.5	137.3216	ppb
|	Zn	66	32817143.9	3042.4698	ppb
|	Zn	67	4914716.4	2845.2169	ppb
|	Zn	68	22467321.3	2864.1083	ppb
|	As	75	278970.7	30.76147	ppb
|	Se	77	26594.1	20.08387	ppb
|	Se	82	33743.2	34.4356	ppb
|>	Rh	103	1697110.3		ppb
|	Ag	107	1863348.3	51.11684	ppb
|	Ag	109	1757232.8		ppb
|	Cd	111	372469.2	44.68817	ppb
|-	Cd	114	825152.7	43.36483	ppb
|-	Sb	121	1040388.5		ppb
|	Sb	123	792025.2	43.1405	ppb
|	Ba	135	940719.3		ppb
|	Ba	137	1602209.6	147.62313	ppb
|>	Ho	165	1728847.6		ppb
|	Tl	205	1815483	43.75623	ppb
|-	Pb	208	16747457	304.62238	ppb
	Kr	83	176		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-4
Sample Dat Tuesday, October 03, 2017 10:04:43
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1259418.5		ppb
|-	Be	9	266.7	0.03824	ppb
|-	P	31	927657.3	219.60852	ppb

|>	Sc	45	2233646.1		ppb
|	Cr	52	3919688.4	52.21845	ppb
|-	Cr	53	448975.7	30.90737	ppb
|-	Co	59	506645.6	6.80094	ppb
|	Ni	60	607674.3	39.50062	ppb
|	Cu	63	2783825.8	77.59191	ppb
|	Cu	65	1241346.9	74.01685	ppb
|	Zn	66	36740376.8	3352.3124	ppb
|	Zn	67	5488461.4	3127.0725	ppb
|	Zn	68	25261295.9	3169.3106	ppb
|	As	75	13667	1.56588	ppb
|	Se	77	2138.8	-11.58206	ppb
|	Se	82	2198.1	2.07949	ppb
|>	Rh	103	1724612.9		ppb
|	Ag	107	33899.2	0.85492	ppb
|	Ag	109	28096.3		ppb
|	Cd	111	50346.4	5.9318	ppb
|-	Cd	114	96767.6	4.99232	ppb
|-	Sb	121	200243.2		ppb
|	Sb	123	150900.6	8.2962	ppb
|	Ba	135	525518.6		ppb
|	Ba	137	899758.8	83.85289	ppb
|>	Ho	165	1709032.6		ppb
|	Tl	205	4119.6	0.09	ppb
|-	Pb	208	12900242.5	237.33716	ppb
	Kr	83	187.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-5
Sample Dat Tuesday, October 03, 2017 10:07:47
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1277630.8		ppb
|-	Be	9	233.7	0.03231	ppb
|-	P	31	921102.2	235.72788	ppb
|>	Sc	45	2070909.1		ppb
|	Cr	52	3287558.9	47.13075	ppb
|-	Cr	53	378897.8	26.2284	ppb
|-	Co	59	288655.5	3.83973	ppb
|	Ni	60	629774	40.58199	ppb
|	Cu	63	2598254.9	71.78801	ppb
|	Cu	65	1166611	68.95243	ppb
|	Zn	66	33105541.1	2994.3858	ppb
|	Zn	67	4926881.1	2782.6004	ppb
|	Zn	68	22546256.5	2803.8472	ppb
|	As	75	15458.4	1.74466	ppb
|	Se	77	2370.9	-11.31423	ppb
|	Se	82	2481.5	2.34284	ppb
|>	Rh	103	1739614.9		ppb
|	Ag	107	26422.4	0.64671	ppb
|	Ag	109	22096.1		ppb
|	Cd	111	109112	12.75913	ppb
|-	Cd	114	235098	12.04216	ppb
|-	Sb	121	178624.9		ppb
|	Sb	123	135939.2	7.27871	ppb
|	Ba	135	567937.4		ppb
|	Ba	137	970891.4	88.14611	ppb
|>	Ho	165	1754348.6		ppb
|	Tl	205	3967.6	0.08378	ppb
|-	Pb	208	12225578.6	219.11207	ppb
	Kr	83	179		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7
Sample Dat Tuesday, October 03, 2017 10:13:54
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1293908.3		ppb
|-	Be	9	129	0.01527	ppb
|-	P	31	391963.2	97.75172	ppb
|>	Sc	45	2035445.1		ppb

|	Cr	52	551615.4	7.11166	ppb
|-	Cr	53	59315.9	-13.65893	ppb
|-	Co	59	12928.2	0.16906	ppb
|	Ni	60	158507.3	10.22506	ppb
|	Cu	63	155199.4	4.25468	ppb
|	Cu	65	72721.2	4.26439	ppb
|	Zn	66	138382	12.22622	ppb
|	Zn	67	23650.9	11.69811	ppb
|	Zn	68	119109.2	14.38073	ppb
|	As	75	4559.2	0.57639	ppb
|	Se	77	836	-13.24618	ppb
|	Se	82	473.4	0.33669	ppb
|>	Rh	103	1735176.5		ppb
|	Ag	107	8874.1	0.1771	ppb
|	Ag	109	7790.1		ppb
|	Cd	111	3678.4	0.4187	ppb
|-	Cd	114	3310.4	0.15676	ppb
|-	Sb	121	15822.4		ppb
|	Sb	123	12021.6	0.63453	ppb
|	Ba	135	192961.6		ppb
|	Ba	137	333320.8	30.73394	ppb
|>	Ho	165	1726897.6		ppb
|	Tl	205	2613.2	0.05253	ppb
|-	Pb	208	206612.4	3.70325	ppb
	Kr	83	125.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 10:16:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1186728		ppb
|-	Be	9	211.3	0.03135	ppb
|-	P	31	26995.5	0.20953	ppb
|>	Sc	45	1876113.9		ppb
|	Cr	52	61872.5	-0.12752	ppb
|-	Cr	53	57338.7	-13.29842	ppb
|-	Co	59	2521.2	0.03131	ppb
|	Ni	60	1093.4	0.05184	ppb
|	Cu	63	159551.4	4.5282	ppb
|	Cu	65	75153.5	4.56276	ppb
|	Zn	66	17176.7	1.28592	ppb
|	Zn	67	3631.1	0.42412	ppb
|	Zn	68	13057.3	1.21099	ppb
|	As	75	22434.8	2.5814	ppb
|	Se	77	8819.7	-2.77436	ppb
|	Se	82	396.8	0.27309	ppb
|>	Rh	103	1678357.9		ppb
|	Ag	107	1971.1	-0.00665	ppb
|	Ag	109	1959.5		ppb
|	Cd	111	4757.6	0.56454	ppb
|-	Cd	114	11430.2	0.594	ppb
|-	Sb	121	974.7		ppb
|	Sb	123	735.1	0.02523	ppb
|	Ba	135	785		ppb
|	Ba	137	1269.1	0.12005	ppb
|>	Ho	165	1490756.2		ppb
|	Tl	205	7308.2	0.19387	ppb
|-	Pb	208	312770.6	6.54157	ppb
	Kr	83	117.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 10:20:03
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1211953.3		ppb
|-	Be	9	618036.9	104.59138	ppb
|-	P	31	3646512.5	1031.8948	ppb
|>	Sc	45	1919386.2		ppb
|	Cr	52	6563293.8	102.8186	ppb

|-	Cr	53	840867.3	92.35788	ppb
|-	Co	59	7496100.6	102.51048	ppb
|	Ni	60	1530434.4	101.335	ppb
|	Cu	63	4026506.9	114.29736	ppb
|	Cu	65	1815716.1	110.25737	ppb
|	Zn	66	1114538.9	103.22712	ppb
|	Zn	67	180830.9	103.25615	ppb
|	Zn	68	797892.2	101.46434	ppb
|	As	75	939796.3	103.63378	ppb
|	Se	77	88880.1	100.84436	ppb
|	Se	82	99441.9	101.97873	ppb
|>	Rh	103	1693571.8		ppb
|	Ag	107	4006643.7	110.21107	ppb
|	Ag	109	3752399.3		ppb
|	Cd	111	835235	100.41609	ppb
|-	Cd	114	1900044.7	100.07047	ppb
|-	Sb	121	2300128.5		ppb
|	Sb	123	1664890.1	103.40209	ppb
|	Ba	135	581331.2		ppb
|	Ba	137	992898.9	104.28766	ppb
|>	Ho	165	1516534.4		ppb
|	Tl	205	3829045.9	105.21697	ppb
|-	Pb	208	5559399.8	115.23334	ppb
	Kr	83	121.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8
Sample Dat Tuesday, October 03, 2017 10:23:08
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1260427.1		ppb
|-	Be	9	391.3	0.0585	ppb
|-	P	31	385215.3	101.03228	ppb
|>	Sc	45	1939419.8		ppb
|	Cr	52	511884.2	6.89469	ppb
|-	Cr	53	57130.7	-13.57911	ppb
|-	Co	59	9595.6	0.12618	ppb
|	Ni	60	153837.6	10.04667	ppb
|	Cu	63	334881.4	9.35031	ppb
|	Cu	65	154845.8	9.248	ppb
|	Zn	66	102750.6	9.10859	ppb
|	Zn	67	17146	8.13204	ppb
|	Zn	68	78289.3	9.41036	ppb
|	As	75	25837.9	2.89905	ppb
|	Se	77	920	-13.12569	ppb
|	Se	82	398	0.26597	ppb
|>	Rh	103	1713986.6		ppb
|	Ag	107	8005.2	0.15641	ppb
|	Ag	109	6174.3		ppb
|	Cd	111	7806.4	0.91476	ppb
|-	Cd	114	8751.5	0.44193	ppb
|-	Sb	121	8400.1		ppb
|	Sb	123	6298.5	0.32522	ppb
|	Ba	135	90297.5		ppb
|	Ba	137	154489.5	14.35042	ppb
|>	Ho	165	1713293.8		ppb
|	Tl	205	13335.6	0.31391	ppb
|-	Pb	208	592229.5	10.81301	ppb
	Kr	83	134		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample Dat Tuesday, October 03, 2017 10:26:13
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1521605.4		ppb
|-	Be	9	643.3	0.0816	ppb
|-	P	31	23913968.1	5134.8046	ppb
|>	Sc	45	2544482.5		ppb
|	Cr	52	98576.2	0.04751	ppb
|-	Cr	53	246137.1	3.86251	ppb

|-	Co	59	15184.7	0.15847	ppb
|	Ni	60	6356.4	0.30708	ppb
|	Cu	63	364039	8.02027	ppb
|	Cu	65	166864.7	7.86253	ppb
|	Zn	66	40182.1	2.58726	ppb
|	Zn	67	12098.8	3.77422	ppb
|	Zn	68	28227.5	2.3398	ppb
|	As	75	52222.6	4.57607	ppb
|	Se	77	19809.4	5.7014	ppb
|	Se	82	823.6	0.52194	ppb
|>	Rh	103	2171458.5		ppb
|	Ag	107	4657.8	0.03858	ppb
|	Ag	109	4204.3		ppb
|	Cd	111	10340.5	0.95729	ppb
|-	Cd	114	24576.2	0.99636	ppb
|-	Sb	121	2806.9		ppb
|	Sb	123	2158.9	0.08726	ppb
|	Ba	135	2640.6		ppb
|	Ba	137	4446.4	0.36224	ppb
|>	Ho	165	1874734.2		ppb
|	Tl	205	16492.2	0.35624	ppb
|-	Pb	208	646802.9	10.79443	ppb
	Kr	83	141.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample Dat Tuesday, October 03, 2017 10:29:16
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1428265.1		ppb
|-	Be	9	479.3	0.06365	ppb
|-	P	31	27554756.9	6329.5289	ppb
|>	Sc	45	2379656.2		ppb
|	Cr	52	199650.5	1.4204	ppb
|-	Cr	53	240652.3	5.00534	ppb
|-	Co	59	241905.6	2.85911	ppb
|	Ni	60	59475.2	3.38742	ppb
|	Cu	63	421697.1	10.31772	ppb
|	Cu	65	193807.4	10.14572	ppb
|	Zn	66	62643.1	4.7125	ppb
|	Zn	67	15435.3	6.05011	ppb
|	Zn	68	42988.6	4.2807	ppb
|	As	75	65034.3	6.28768	ppb
|	Se	77	20045.1	8.17076	ppb
|	Se	82	2243.5	1.85622	ppb
|>	Rh	103	1957019.6		ppb
|	Ag	107	3356152.1	79.86371	ppb
|	Ag	109	3134308		ppb
|	Cd	111	16394	1.69367	ppb
|-	Cd	114	38760.5	1.75396	ppb
|-	Sb	121	2269.8		ppb
|	Sb	123	1717.5	0.06783	ppb
|	Ba	135	2725.3		ppb
|	Ba	137	4668.1	0.39381	ppb
|>	Ho	165	1816934.8		ppb
|	Tl	205	15273.5	0.34	ppb
|-	Pb	208	648295.3	11.16719	ppb
	Kr	83	133		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB
Sample Dat Tuesday, October 03, 2017 10:36:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1116352.6		ppb
|-	Be	9	241.3	0.03921	ppb
|-	P	31	132367.7	33.00868	ppb
|>	Sc	45	1781370.8		ppb
|	Cr	52	96483.7	0.5167	ppb
|-	Cr	53	8007.2	-20.0523	ppb
|-	Co	59	5112.9	0.06883	ppb

|	Ni	60	8436.5	0.55655	ppb
|	Cu	63	240499.7	7.01929	ppb
|	Cu	65	111611.5	6.96814	ppb
|	Zn	66	45865.5	4.0829	ppb
|	Zn	67	6955.4	2.47312	ppb
|	Zn	68	33282.1	3.92494	ppb
|	As	75	22436.7	2.64424	ppb
|	Se	77	762.4	-13.28185	ppb
|	Se	82	289.6	0.16992	ppb
|>	Rh	103	1637482.7		ppb
|	Ag	107	3297.7	0.03255	ppb
|	Ag	109	3003		ppb
|	Cd	111	5507.8	0.67249	ppb
|-	Cd	114	12438.9	0.66434	ppb
|-	Sb	121	2813.3		ppb
|	Sb	123	2125.5	0.10484	ppb
|	Ba	135	2900		ppb
|	Ba	137	4920.2	0.47815	ppb
|>	Ho	165	1588281.8		ppb
|	Tl	205	11648.8	0.2954	ppb
|-	Pb	208	490569.7	9.6641	ppb
	Kr	83	92.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB
Sample Dat Tuesday, October 03, 2017 10:39:12
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1208173.8		ppb
|-	Be	9	198966.9	33.77978	ppb
|-	P	31	580554.7	160.42898	ppb
|>	Sc	45	1890042.6		ppb
|	Cr	52	3173017.2	49.90628	ppb
|-	Cr	53	370056.8	29.55505	ppb
|-	Co	59	3486164.1	46.90707	ppb
|	Ni	60	698834	45.51559	ppb
|	Cu	63	1759754.6	49.12235	ppb
|	Cu	65	822778.7	49.13329	ppb
|	Zn	66	329886.6	29.83179	ppb
|	Zn	67	55760.3	30.14236	ppb
|	Zn	68	246155.1	30.47039	ppb
|	As	75	294576.1	32.02215	ppb
|	Se	77	19432.9	10.46804	ppb
|	Se	82	23744.8	23.8526	ppb
|>	Rh	103	1721265.5		ppb
|	Ag	107	1801384.6	48.72423	ppb
|	Ag	109	1687853.1		ppb
|	Cd	111	301848	35.69643	ppb
|-	Cd	114	689355.6	35.712	ppb
|-	Sb	121	864955.4		ppb
|	Sb	123	663137.6	36.87914	ppb
|	Ba	135	309045.2		ppb
|	Ba	137	526867.3	49.55967	ppb
|>	Ho	165	1693013.6		ppb
|	Tl	205	1833790.6	45.13201	ppb
|-	Pb	208	2965720.1	55.03643	ppb
	Kr	83	99		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-1
Sample Dat Tuesday, October 03, 2017 10:42:16
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1225131.3		ppb
|-	Be	9	805	0.13005	ppb
|-	P	31	201139.6	46.90581	ppb
|>	Sc	45	2017596.8		ppb
|	Cr	52	682981.2	9.163	ppb
|-	Cr	53	152877.1	-1.56459	ppb
|-	Co	59	71029.5	0.92857	ppb
|	Ni	60	130597.4	8.27627	ppb

|	Cu	63	963086.3	26.20995	ppb
|	Cu	65	447058.5	26.02588	ppb
|	Zn	66	7353166.6	655.15883	ppb
|	Zn	67	1075492	597.23116	ppb
|	Zn	68	5090120.5	623.3599	ppb
|	As	75	71360.7	7.63649	ppb
|	Se	77	11940.3	0.54016	ppb
|	Se	82	4797.2	4.58951	ppb
|>	Rh	103	1765344		ppb
|	Ag	107	22006.3	0.51978	ppb
|	Ag	109	20468.3		ppb
|	Cd	111	26613.4	3.05919	ppb
|-	Cd	114	60631.8	3.05228	ppb
|-	Sb	121	37399.2		ppb
|	Sb	123	28119	1.633	ppb
|	Ba	135	77563		ppb
|	Ba	137	133253	13.23927	ppb
|>	Ho	165	1601492.8		ppb
|	Tl	205	26319.3	0.67498	ppb
|-	Pb	208	2248996.3	44.12353	ppb
	Kr	83	123.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 10:45:20
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1249110.7		ppb
|-	Be	9	477.7	0.07343	ppb
|-	P	31	223227.2	53.57052	ppb
|>	Sc	45	1995355.5		ppb
|	Cr	52	598382.9	7.98744	ppb
|-	Cr	53	137619.1	-3.33218	ppb
|-	Co	59	63673.9	0.82778	ppb
|	Ni	60	104060.8	6.55703	ppb
|	Cu	63	759210.1	20.53579	ppb
|	Cu	65	353611.7	20.46223	ppb
|	Zn	66	5518688.2	489.14744	ppb
|	Zn	67	813038.1	448.79194	ppb
|	Zn	68	3822230	465.65785	ppb
|	As	75	42885.3	4.59718	ppb
|	Se	77	9912.1	-2.04439	ppb
|	Se	82	2645.8	2.45599	ppb
|>	Rh	103	1774060.2		ppb
|	Ag	107	12993.6	0.28021	ppb
|	Ag	109	11111.3		ppb
|	Cd	111	18452	2.10526	ppb
|-	Cd	114	41742.7	2.08548	ppb
|-	Sb	121	30077.6		ppb
|	Sb	123	22822.1	1.32604	ppb
|	Ba	135	76704		ppb
|	Ba	137	129098.5	12.87166	ppb
|>	Ho	165	1595800.5		ppb
|	Tl	205	15168.1	0.38578	ppb
|-	Pb	208	1906204.1	37.51348	ppb
	Kr	83	139		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 10:48:23
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1298801.4		ppb
|-	Be	9	405	0.05876	ppb
|-	P	31	224974.8	52.48831	ppb
|>	Sc	45	2046672.2		ppb
|	Cr	52	602142.1	7.81413	ppb
|-	Cr	53	133544	-4.29738	ppb
|-	Co	59	63277.2	0.81153	ppb
|	Ni	60	103966	6.4635	ppb
|	Cu	63	695903.8	18.57124	ppb

|	Cu	65	323806.7	18.48504	ppb
|	Zn	66	5574607.4	487.44024	ppb
|	Zn	67	818294.5	445.56669	ppb
|	Zn	68	3843825.9	461.98571	ppb
|	As	75	33114.6	3.52419	ppb
|	Se	77	9826.4	-2.31693	ppb
|	Se	82	2573.6	2.35138	ppb
|>	Rh	103	1798469.1		ppb
|	Ag	107	12393.7	0.25991	ppb
|	Ag	109	11007.2		ppb
|	Cd	111	16651.2	1.87312	ppb
|-	Cd	114	38100.9	1.87706	ppb
|-	Sb	121	29799.4		ppb
|	Sb	123	22848.7	1.29866	ppb
|	Ba	135	75296.3		ppb
|	Ba	137	130995.7	12.78066	ppb
|>	Ho	165	1630748.3		ppb
|	Tl	205	12069.4	0.29808	ppb
|-	Pb	208	1776071.4	34.19793	ppb
	Kr	83	121.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 10:51:27
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1318304.7		ppb
|-	Be	9	419.3	0.06009	ppb
|-	P	31	286791.9	66.98286	ppb
|>	Sc	45	2102394.8		ppb
|	Cr	52	987839.9	13.15444	ppb
|-	Cr	53	181932	1.2196	ppb
|-	Co	59	98443	1.26284	ppb
|	Ni	60	149149.6	9.26911	ppb
|	Cu	63	974465.7	25.98404	ppb
|	Cu	65	454738.5	25.94073	ppb
|	Zn	66	10285264.3	898.53734	ppb
|	Zn	67	1496820.2	815.4637	ppb
|	Zn	68	7055675.4	847.3918	ppb
|	As	75	33214.1	3.52993	ppb
|	Se	77	11278.5	-0.56116	ppb
|	Se	82	4121	3.84209	ppb
|>	Rh	103	1800651.3		ppb
|	Ag	107	16222.5	0.35865	ppb
|	Ag	109	14614.1		ppb
|	Cd	111	28304.7	3.18892	ppb
|-	Cd	114	62670.7	3.0917	ppb
|-	Sb	121	52964.7		ppb
|	Sb	123	39801	2.21317	ppb
|	Ba	135	127608		ppb
|	Ba	137	217563.8	20.63502	ppb
|>	Ho	165	1678232.2		ppb
|	Tl	205	12052.4	0.2891	ppb
|-	Pb	208	3204528	60.0074	ppb
	Kr	83	127		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 10:54:31
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1097399.2		ppb
|-	Be	9	274816.6	51.36507	ppb
|-	P	31	942802.3	283.43142	ppb
|>	Sc	45	1772731.2		ppb
|	Cr	52	4520338.7	76.39846	ppb
|-	Cr	53	607206	67.61714	ppb
|-	Co	59	4164844.3	61.10626	ppb
|	Ni	60	963088.9	68.41019	ppb
|	Cu	63	2876730	87.60953	ppb
|	Cu	65	1313832.1	85.58524	ppb

|	Zn	66	10743126.2	1070.5651	ppb
|	Zn	67	1576974.5	980.29806	ppb
|	Zn	68	7368489.9	1009.4102	ppb
|	As	75	428732.8	50.76837	ppb
|	Se	77	42250.4	44.42067	ppb
|	Se	82	43077.5	47.32063	ppb
|>	Rh	103	1578619.5		ppb
|	Ag	107	2083538.5	61.43541	ppb
|	Ag	109	1886796.4		ppb
|	Cd	111	414773.3	53.49531	ppb
|-	Cd	114	944587.8	53.36696	ppb
|-	Sb	121	1142182.8		ppb
|	Sb	123	862354.1	56.07768	ppb
|	Ba	135	446019.9		ppb
|	Ba	137	764115.8	84.03681	ppb
|>	Ho	165	1448207		ppb
|	Tl	205	1880033.7	54.09341	ppb
|-	Pb	208	5861236.8	127.2311	ppb
	Kr	83	133.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-4
Sample Dat Tuesday, October 03, 2017 11:03:42
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1335048.2		ppb
|-	Be	9	369	0.05151	ppb
|-	P	31	281255.7	63.49938	ppb
|>	Sc	45	2162979.3		ppb
|	Cr	52	894236.5	11.43875	ppb
|-	Cr	53	170213.8	-0.80985	ppb
|-	Co	59	114341.1	1.43739	ppb
|	Ni	60	142312.1	8.66274	ppb
|	Cu	63	789684.9	20.61792	ppb
|	Cu	65	365177.1	20.39463	ppb
|	Zn	66	11626436.3	995.02821	ppb
|	Zn	67	1673232.3	893.25706	ppb
|	Zn	68	7890363.7	928.44699	ppb
|	As	75	21825.3	2.30313	ppb
|	Se	77	8964.5	-3.60165	ppb
|	Se	82	1035.6	0.84197	ppb
|>	Rh	103	1837964		ppb
|	Ag	107	9507.2	0.17976	ppb
|	Ag	109	8367.5		ppb
|	Cd	111	16968.5	1.86737	ppb
|-	Cd	114	36760.2	1.77073	ppb
|-	Sb	121	51165.5		ppb
|	Sb	123	38778.4	2.15879	ppb
|	Ba	135	104072.4		ppb
|	Ba	137	179281.8	17.02855	ppb
|>	Ho	165	1675633.5		ppb
|	Tl	205	8369.1	0.19777	ppb
|-	Pb	208	2765628.7	51.85103	ppb
	Kr	83	137.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 11:06:47
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1226194.7		ppb
|-	Be	9	296.3	0.04437	ppb
|-	P	31	31020	1.19056	ppb
|>	Sc	45	1917787.9		ppb
|	Cr	52	68722	-0.04073	ppb
|-	Cr	53	90703.5	-8.95611	ppb
|-	Co	59	3616.8	0.04517	ppb
|	Ni	60	1395.7	0.06969	ppb
|	Cu	63	136067.3	3.75604	ppb
|	Cu	65	62635.7	3.69737	ppb
|	Zn	66	25951.6	2.04786	ppb

|	Zn	67	5594.4	1.49141	ppb
|	Zn	68	18819.1	1.89281	ppb
|	As	75	18769.7	2.12096	ppb
|	Se	77	9901.8	-1.68458	ppb
|	Se	82	384.5	0.25071	ppb
|>	Rh	103	1722008.7		ppb
|	Ag	107	2287.5	0.00065	ppb
|	Ag	109	2063.1		ppb
|	Cd	111	4236	0.48836	ppb
|-	Cd	114	9635.7	0.4858	ppb
|-	Sb	121	1269.1		ppb
|	Sb	123	976	0.03876	ppb
|	Ba	135	824.7		ppb
|	Ba	137	1510.4	0.14143	ppb
|>	Ho	165	1533162.7		ppb
|	Tl	205	6640.9	0.17008	ppb
|-	Pb	208	262162.7	5.32148	ppb
	Kr	83	105.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 11:09:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1221792.6		ppb
|-	Be	9	626086.4	105.10725	ppb
|-	P	31	3783165.2	1046.3899	ppb
|>	Sc	45	1963937.2		ppb
|	Cr	52	6723973.1	102.94346	ppb
|-	Cr	53	866890.3	93.25306	ppb
|-	Co	59	7590206.5	102.35085	ppb
|	Ni	60	1560039.5	101.85251	ppb
|	Cu	63	3837036.8	107.39653	ppb
|	Cu	65	1759453.9	105.34936	ppb
|	Zn	66	1135940.9	103.74776	ppb
|	Zn	67	184717.2	104.02111	ppb
|	Zn	68	817561.3	102.52273	ppb
|	As	75	935233.8	101.69593	ppb
|	Se	77	90515.5	101.33105	ppb
|	Se	82	101221.7	102.35284	ppb
|>	Rh	103	1717496.7		ppb
|	Ag	107	4034670.8	109.43761	ppb
|	Ag	109	3800615.7		ppb
|	Cd	111	840798	99.67294	ppb
|-	Cd	114	1982347.3	102.94593	ppb
|-	Sb	121	2325778.2		ppb
|	Sb	123	1693837.2	103.92826	ppb
|	Ba	135	583050.7		ppb
|	Ba	137	995127.9	103.2548	ppb
|>	Ho	165	1535305.5		ppb
|	Tl	205	3786663.2	102.78588	ppb
|-	Pb	208	5187501.2	106.21562	ppb
	Kr	83	128.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-5
Sample Dat Tuesday, October 03, 2017 11:12:56
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1323132.3		ppb
|-	Be	9	402.3	0.05737	ppb
|-	P	31	282565.1	66.36912	ppb
|>	Sc	45	2088710.9		ppb
|	Cr	52	754701.1	9.85444	ppb
|-	Cr	53	152694.5	-2.26063	ppb
|-	Co	59	67615.6	0.84775	ppb
|	Ni	60	145021.1	8.81826	ppb
|	Cu	63	679120.2	17.70698	ppb
|	Cu	65	316374	17.64283	ppb
|	Zn	66	10474432.8	895.43005	ppb
|	Zn	67	1522730.9	811.78516	ppb

|	Zn	68	7215783.5	848.03356	ppb
|	As	75	15583.6	1.66753	ppb
|	Se	77	8957.1	-3.62308	ppb
|	Se	82	1065.7	0.86951	ppb
|>	Rh	103	1840377.6		ppb
|	Ag	107	9322	0.17485	ppb
|	Ag	109	8355.1		ppb
|	Cd	111	31716.4	3.49775	ppb
|-	Cd	114	70933.8	3.42545	ppb
|-	Sb	121	46783.5		ppb
|	Sb	123	35055.9	1.96183	ppb
|	Ba	135	111596.2		ppb
|	Ba	137	191531.8	18.30593	ppb
|>	Ho	165	1665423.5		ppb
|	Tl	205	6799	0.15982	ppb
|-	Pb	208	2497791.5	47.11596	ppb
	Kr	83	125		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7 FH
Sample Dat Tuesday, October 03, 2017 11:25:10
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1252114.6		ppb
|-	Be	9	266.7	0.03849	ppb
|-	P	31	169549	36.56248	ppb
|>	Sc	45	2097970.2		ppb
|	Cr	52	836121.3	10.98572	ppb
|-	Cr	53	94804.5	-9.49973	ppb
|-	Co	59	9875.7	0.12894	ppb
|	Ni	60	286858.8	18.60895	ppb
|	Cu	63	141491.3	3.89535	ppb
|	Cu	65	66161.6	3.8961	ppb
|	Zn	66	156026.9	13.88726	ppb
|	Zn	67	32363	16.71562	ppb
|	Zn	68	157144.7	19.21135	ppb
|	As	75	4529.7	0.57639	ppb
|	Se	77	726.7	-13.38023	ppb
|	Se	82	189.2	0.05266	ppb
|>	Rh	103	1727564.3		ppb
|	Ag	107	5718.5	0.093	ppb
|	Ag	109	3152.3		ppb
|	Cd	111	5132.5	0.59254	ppb
|-	Cd	114	3820.5	0.18398	ppb
|-	Sb	121	15743.7		ppb
|	Sb	123	11772.3	0.62335	ppb
|	Ba	135	509929		ppb
|	Ba	137	871232.5	80.6642	ppb
|>	Ho	165	1720699.1		ppb
|	Tl	205	2638.9	0.05349	ppb
|-	Pb	208	204870.3	3.68875	ppb
	Kr	83	187		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7 BH undig
Sample Dat Tuesday, October 03, 2017 11:28:14
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	996985.8		ppb
|-	Be	9	215.3	0.03922	ppb
|-	P	31	181192.2	56.98535	ppb
|>	Sc	45	1533887.8		ppb
|	Cr	52	135690.1	1.55932	ppb
|-	Cr	53	9638.6	-19.58849	ppb
|-	Co	59	6862	0.10552	ppb
|	Ni	60	11031.3	0.82678	ppb
|	Cu	63	89847.8	2.92202	ppb
|	Cu	65	41388.4	2.87847	ppb
|	Zn	66	55686.1	5.6816	ppb
|	Zn	67	8484.9	4.01478	ppb
|	Zn	68	40119.4	5.4784	ppb

|	As	75	7164.9	1.00637	ppb
|	Se	77	765.4	-13.15227	ppb
|	Se	82	414	0.35592	ppb
|>	Rh	103	1459454.2		ppb
|	Ag	107	3972.9	0.06556	ppb
|	Ag	109	3615.8		ppb
|	Cd	111	1892.6	0.25229	ppb
|-	Cd	114	4224.7	0.24556	ppb
|-	Sb	121	1850.8		ppb
|	Sb	123	1362.2	0.07114	ppb
|	Ba	135	4423		ppb
|	Ba	137	7576.7	0.85295	ppb
|>	Ho	165	1390123.8		ppb
|	Tl	205	3930.9	0.10754	ppb
|-	Pb	208	151800.6	3.38096	ppb
	Kr	83	80.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8 FH
Sample Dat Tuesday, October 03, 2017 11:34:21
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1216512.9		ppb
|-	Be	9	275.3	0.04124	ppb
|-	P	31	202624	51.41939	ppb
|>	Sc	45	1877049.3		ppb
|	Cr	52	807716.3	11.95231	ppb
|-	Cr	53	91697.7	-8.54962	ppb
|-	Co	59	8915.4	0.11751	ppb
|	Ni	60	281322.5	18.46917	ppb
|	Cu	63	134004.6	3.73163	ppb
|	Cu	65	62228.9	3.70678	ppb
|	Zn	66	132564.2	11.89972	ppb
|	Zn	67	23019.2	11.55781	ppb
|	Zn	68	103797.4	12.68868	ppb
|	As	75	6423.9	0.78934	ppb
|	Se	77	624.7	-13.50015	ppb
|	Se	82	192.6	0.05853	ppb
|>	Rh	103	1706516.5		ppb
|	Ag	107	6350.1	0.11213	ppb
|	Ag	109	3923.9		ppb
|	Cd	111	4339.6	0.50508	ppb
|-	Cd	114	2722	0.12896	ppb
|-	Sb	121	12641.3		ppb
|	Sb	123	9635.7	0.52128	ppb
|	Ba	135	168853.1		ppb
|	Ba	137	289802.7	27.57627	ppb
|>	Ho	165	1673279.1		ppb
|	Tl	205	2694.6	0.05667	ppb
|-	Pb	208	171488.3	3.16633	ppb
	Kr	83	180.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8 C8A
Sample Dat Tuesday, October 03, 2017 11:37:25
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	988352.1		ppb
|-	Be	9	106.7	0.01694	ppb
|-	P	31	87421	24.02754	ppb
|>	Sc	45	1509759.2		ppb
|	Cr	52	143002	1.75012	ppb
|-	Cr	53	4820.5	-20.39034	ppb
|-	Co	59	1872.5	0.0258	ppb
|	Ni	60	5629.1	0.40518	ppb
|	Cu	63	38727.4	1.21292	ppb
|	Cu	65	18036.7	1.20801	ppb
|	Zn	66	30534.9	2.92053	ppb
|	Zn	67	4637.8	1.37684	ppb
|	Zn	68	22085.7	2.75447	ppb
|	As	75	3201.9	0.4904	ppb

|	Se	77	422.7	-13.67716	ppb
|	Se	82	96.6	-0.02446	ppb
|>	Rh	103	1480681.8		ppb
|	Ag	107	2099.8	0.00479	ppb
|	Ag	109	1985.8		ppb
|	Cd	111	880.3	0.10845	ppb
|-	Cd	114	2035.7	0.10923	ppb
|-	Sb	121	701.4		ppb
|	Sb	123	528.8	0.01411	ppb
|	Ba	135	1620.1		ppb
|	Ba	137	2732.3	0.2932	ppb
|>	Ho	165	1409736.2		ppb
|	Tl	205	1780.8	0.04219	ppb
|-	Pb	208	65386.9	1.40181	ppb
	Kr	83	99		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8 C9
Sample Dat Tuesday, October 03, 2017 11:40:29
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1144797.1		ppb
|-	Be	9	81	0.00934	ppb
|-	P	31	296348.3	84.32356	ppb
|>	Sc	45	1763196.3		ppb
|	Cr	52	113290.2	0.82388	ppb
|-	Cr	53	8265.4	-20.00245	ppb
|-	Co	59	2013.5	0.02512	ppb
|	Ni	60	11555	0.77362	ppb
|	Cu	63	63929.7	1.84071	ppb
|	Cu	65	30198.6	1.86071	ppb
|	Zn	66	24316.7	2.02233	ppb
|	Zn	67	3742.5	0.55417	ppb
|	Zn	68	18303.7	1.95646	ppb
|	As	75	1947.8	0.30975	ppb
|	Se	77	509.7	-13.6177	ppb
|	Se	82	82.3	-0.05016	ppb
|>	Rh	103	1630430.5		ppb
|	Ag	107	2339.2	0.00557	ppb
|	Ag	109	2316.2		ppb
|	Cd	111	724.2	0.0779	ppb
|-	Cd	114	3412.7	0.1729	ppb
|-	Sb	121	803.7		ppb
|	Sb	123	604.4	0.01476	ppb
|	Ba	135	3269		ppb
|	Ba	137	5586.4	0.54685	ppb
|>	Ho	165	1582852.7		ppb
|	Tl	205	1673.4	0.03363	ppb
|-	Pb	208	68667.6	1.30777	ppb
	Kr	83	91.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 11:43:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1174284		ppb
|-	Be	9	113.3	0.01461	ppb
|-	P	31	25903.8	-0.07054	ppb
|>	Sc	45	1867176.6		ppb
|	Cr	52	58972.5	-0.16996	ppb
|-	Cr	53	68774.9	-11.66967	ppb
|-	Co	59	1525.7	0.01742	ppb
|	Ni	60	742	0.028	ppb
|	Cu	63	25347.8	0.67659	ppb
|	Cu	65	11820.9	0.67452	ppb
|	Zn	66	10594.3	0.66178	ppb
|	Zn	67	3124	0.11485	ppb
|	Zn	68	8239	0.58233	ppb
|	As	75	2792.9	0.39619	ppb
|	Se	77	8576.9	-3.16583	ppb

|	Se	82	132.1	-0.00191	ppb
|>	Rh	103	1689474.1		ppb
|	Ag	107	1749.8	-0.01309	ppb
|	Ag	109	1565.1		ppb
|	Cd	111	861.8	0.09133	ppb
|-	Cd	114	1980.2	0.09116	ppb
|-	Sb	121	475		ppb
|	Sb	123	358.9	0.00099	ppb
|	Ba	135	357.3		ppb
|	Ba	137	639	0.05135	ppb
|>	Ho	165	1521481.9		ppb
|	Tl	205	1621.1	0.03396	ppb
|-	Pb	208	52455.5	1.02768	ppb
	Kr	83	111.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 11:46:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1198265.3		ppb
|-	Be	9	6223.4	1.06028	ppb
|-	P	31	105384	22.79532	ppb
|>	Sc	45	1893488.2		ppb
|	Cr	52	126498.3	0.90098	ppb
|-	Cr	53	78428.2	-10.47733	ppb
|-	Co	59	75631.8	1.00491	ppb
|	Ni	60	16177.5	1.02335	ppb
|	Cu	63	57942.3	1.55938	ppb
|	Cu	65	27163.1	1.56345	ppb
|	Zn	66	20728.7	1.55354	ppb
|	Zn	67	4915.2	1.07864	ppb
|	Zn	68	15706.3	1.48407	ppb
|	As	75	11530.8	1.32718	ppb
|	Se	77	9188.6	-2.69878	ppb
|	Se	82	1125.8	0.98967	ppb
|>	Rh	103	1737239.2		ppb
|	Ag	107	41586.8	1.05479	ppb
|	Ag	109	39387.9		ppb
|	Cd	111	9090.7	1.05349	ppb
|-	Cd	114	21598.7	1.09618	ppb
|-	Sb	121	23271.3		ppb
|	Sb	123	17706.4	1.06054	ppb
|	Ba	135	6328.1		ppb
|	Ba	137	10888.1	1.10944	ppb
|>	Ho	165	1542024.6		ppb
|	Tl	205	39052.6	1.04515	ppb
|-	Pb	208	95428.5	1.88955	ppb
	Kr	83	123.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 11:49:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1208448.3		ppb
|-	Be	9	625513.4	106.15507	ppb
|-	P	31	3721409.7	1054.5099	ppb
|>	Sc	45	1917352		ppb
|	Cr	52	6603872.7	103.59244	ppb
|-	Cr	53	860290.7	95.12949	ppb
|-	Co	59	7447151.9	98.92945	ppb
|	Ni	60	1560290.2	100.36125	ppb
|	Cu	63	3678882.5	101.44379	ppb
|	Cu	65	1704711.4	100.55915	ppb
|	Zn	66	1116933.2	100.4967	ppb
|	Zn	67	181152.3	100.45457	ppb
|	Zn	68	795938.5	98.31441	ppb
|	As	75	910438.9	97.53603	ppb
|	Se	77	89049.2	97.76852	ppb
|	Se	82	102294.9	101.91602	ppb

|>	Rh	103	1743374.8		ppb
|	Ag	107	3944796.5	105.41314	ppb
|	Ag	109	3654925.7		ppb
|	Cd	111	848803.3	99.13955	ppb
|-	Cd	114	1953867.9	99.97159	ppb
|-	Sb	121	2288248.2		ppb
|	Sb	123	1694427.4	102.51237	ppb
|	Ba	135	590075.2		ppb
|	Ba	137	1016307.4	103.97748	ppb
|>	Ho	165	1556865.8		ppb
|	Tl	205	3763200.3	100.73137	ppb
|-	Pb	208	5049715.7	101.95474	ppb
	Kr	83	141		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Dat Tuesday, October 03, 2017 11:52:49
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1288820.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1985774		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	17232.1		ppb
|	Cu	65	8009.9		ppb
|	Zn	66	8301.4		ppb
|	Zn	67	3390.4		ppb
|	Zn	68	6969.7		ppb
|	As	75	1407		ppb
|	Se	77			ppb
|	Se	82	166.7		ppb
|>	Rh	103	1758854.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1562792.8		ppb
|	Tl	205			ppb
|-	Pb	208	33452.8		ppb
	Kr	83	118.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Dat Tuesday, October 03, 2017 11:54:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1214805.7		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1930474.7		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	56754	1.10153	ppb
|	Cu	65	26565.5	1.10621	ppb
|	Zn	66	20611.6	1.12569	ppb
|	Zn	67	5151.6	1.02146	ppb
|	Zn	68	15795.7	1.1109	ppb
|	As	75	10279.6	0.95407	ppb
|	Se	77			ppb
|	Se	82	1147.1	0.98384	ppb
|>	Rh	103	1737794		ppb

|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1541210.2		ppb
|	Tl	205			ppb
|-	Pb	208	86702.6	1.09744	ppb
	Kr	83	125.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample Dat Tuesday, October 03, 2017 11:56:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1252475		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1981961.6		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3720086.5	102.17253	ppb
|	Cu	65	1744786.5	102.42181	ppb
|	Zn	66	1143474.6	102.36659	ppb
|	Zn	67	186116.5	102.975	ppb
|	Zn	68	815591.5	100.3115	ppb
|	As	75	925566	98.8955	ppb
|	Se	77			ppb
|	Se	82	103241	102.75094	ppb
|>	Rh	103	1744045.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1539121.5		ppb
|	Tl	205			ppb
|-	Pb	208	5016369.1	101.83069	ppb
	Kr	83	137.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Dat Tuesday, October 03, 2017 11:58:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1195540		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1968119.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	17629320.1	499.97919	ppb
|	Cu	65	8125510.4	499.64047	ppb
|	Zn	66	5275372.2	499.4957	ppb
|	Zn	67	849422.7	499.45731	ppb
|	Zn	68	3883191.3	500.12869	ppb
|	As	75	4479011.5	500.32958	ppb
|	Se	77			ppb
|	Se	82	489913.8	499.9592	ppb
|>	Rh	103	1661103.5		ppb
|	Ag	107			ppb

|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1523206.3		ppb
|	Tl	205			ppb
|-	Pb	208	23578476.6	499.09238	ppb
	Kr	83	184.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 12:01:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1293361.4		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2057779.8		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	29751	0.33817	ppb
|	Cu	65	13656.5	0.33093	ppb
|	Zn	66	9295.4	0.09189	ppb
|	Zn	67	4097.9	0.39982	ppb
|	Zn	68	7877.5	0.11336	ppb
|	As	75	2540.9	0.12142	ppb
|	Se	77			ppb
|	Se	82	383.7	0.20994	ppb
|>	Rh	103	1755168.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1531657		ppb
|	Tl	205			ppb
|-	Pb	208	45882.4	0.27643	ppb
	Kr	83	122.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 12:03:06
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1329108.2		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2081249.4		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	60915.3	1.11259	ppb
|	Cu	65	27825.1	1.09357	ppb
|	Zn	66	19963.6	0.98032	ppb
|	Zn	67	6047.9	1.36033	ppb
|	Zn	68	15322.2	0.95095	ppb
|	As	75	11201	0.99131	ppb
|	Se	77			ppb
|	Se	82	1276.6	1.026	ppb
|>	Rh	103	1824103.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb

|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1572415.4		ppb
|	Tl	205			ppb
|-	Pb	208	81555.7	0.9838	ppb
	Kr	83	140.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample Dat Tuesday, October 03, 2017 12:05:10
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1177232.9		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1906641.1		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	8728126.3	250.38373	ppb
|	Cu	65	4090984.7	254.45517	ppb
|	Zn	66	2687558.6	257.28509	ppb
|	Zn	67	434034.7	257.46661	ppb
|	Zn	68	1892558.1	246.35692	ppb
|	As	75	2218529.2	250.85653	ppb
|	Se	77			ppb
|	Se	82	239894.1	247.74969	ppb
|>	Rh	103	1640515.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1479325.6		ppb
|	Tl	205			ppb
|-	Pb	208	11522044.6	250.78272	ppb
	Kr	83	150		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 12:07:14
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1283268.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2086730.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3933904.9	104.21116	ppb
|	Cu	65	1803554.4	103.57683	ppb
|	Zn	66	1167272.7	103.01215	ppb
|	Zn	67	192266.1	104.48	ppb
|	Zn	68	841135.7	100.88082	ppb
|	As	75	945848.9	98.94069	ppb
|	Se	77			ppb
|	Se	82	105425.9	100.71812	ppb
|>	Rh	103	1771969.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb

|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1554399.9		ppb
|	Tl	205			ppb
|-	Pb	208	4964088.3	102.4257	ppb
	Kr	83	148.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample Dat Tuesday, October 03, 2017 12:09:18
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1340437.5		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2122638.2		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	1968763.9	51.13816	ppb
|	Cu	65	914332.1	51.49533	ppb
|	Zn	66	602318.2	51.99858	ppb
|	Zn	67	101123.3	53.22289	ppb
|	Zn	68	435768.5	51.06687	ppb
|	As	75	479341.1	49.311	ppb
|	Se	77			ppb
|	Se	82	54306.8	51.02669	ppb
|>	Rh	103	1798954.1		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1570984.3		ppb
|	Tl	205			ppb
|-	Pb	208	2486069.8	50.40337	ppb
	Kr	83	145		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample Dat Tuesday, October 03, 2017 12:11:21
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1622819.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2609118.2		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	28817.4	0.15585	ppb
|	Cu	65	11074.6	0.04921	ppb
|	Zn	66	24030.5	0.97758	ppb
|	Zn	67	9699.3	2.43305	ppb
|	Zn	68	16938	0.80134	ppb
|	As	75	-910.1	-0.22546	ppb
|	Se	77			ppb
|	Se	82	210.4	0.00154	ppb
|>	Rh	103	2199116.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb

|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1932221.2		ppb
|	Tl	205			ppb
|-	Pb	208	21336.2	-0.33459	ppb
	Kr	83	159		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample Dat Tuesday, October 03, 2017 12:13:25
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1446345.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2430781.1		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	89821.2	1.68734	ppb
|	Cu	65	38628.5	1.53834	ppb
|	Zn	66	44965.3	2.85084	ppb
|	Zn	67	13134.7	4.64496	ppb
|	Zn	68	30980.2	2.51999	ppb
|	As	75	14394.8	1.20751	ppb
|	Se	77			ppb
|	Se	82	1668.6	1.27495	ppb
|>	Rh	103	1970346.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1828344.2		ppb
|	Tl	205			ppb
|-	Pb	208	21989.7	-0.30282	ppb
	Kr	83	145.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 9
Sample Dat Tuesday, October 03, 2017 12:15:29
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1147392		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1879857.6		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	35058	0.50201	ppb
|	Cu	65	16255.9	0.50352	ppb
|	Zn	66	39955.8	2.92626	ppb
|	Zn	67	6305.4	1.71483	ppb
|	Zn	68	29913.3	2.88892	ppb
|	As	75	-96.9	-0.159	ppb
|	Se	77			ppb
|	Se	82	59.9	-0.10152	ppb
|>	Rh	103	1714971.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb

|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1667791.1		ppb
|	Tl	205			ppb
|-	Pb	208	16971	-0.36253	ppb
	Kr	83	104		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 10
Sample Dat Tuesday, October 03, 2017 12:17:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1177102.3		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1885927		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	1606068.1	43.77408	ppb
|	Cu	65	754835.2	44.61106	ppb
|	Zn	66	331749.5	29.78453	ppb
|	Zn	67	56612.3	30.53225	ppb
|	Zn	68	249303.2	30.36205	ppb
|	As	75	280678.5	30.28909	ppb
|	Se	77			ppb
|	Se	82	24353.5	23.96075	ppb
|>	Rh	103	1711898.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1685843.9		ppb
|	Tl	205			ppb
|-	Pb	208	2614392	49.38531	ppb
	Kr	83	100.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 12:19:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1251721		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2008043.4		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	46529	0.7791	ppb
|	Cu	65	21802	0.79489	ppb
|	Zn	66	21192.4	1.14456	ppb
|	Zn	67	6049.6	1.46513	ppb
|	Zn	68	16083.4	1.10011	ppb
|	As	75	8899.2	0.78539	ppb
|	Se	77			ppb
|	Se	82	1170.1	0.96165	ppb
|>	Rh	103	1767695		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb

|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1573148.8		ppb
|	Tl	205			ppb
|-	Pb	208	63600.4	0.61442	ppb
	Kr	83	121		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-1
Sample Dat Tuesday, October 03, 2017 12:21:43
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1250551.9		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1994279.1		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	53999.2	0.97829	ppb
|	Cu	65	25240.9	0.99406	ppb
|	Zn	66	911648.9	80.4825	ppb
|	Zn	67	136430.6	73.76552	ppb
|	Zn	68	625135.8	74.9324	ppb
|	As	75	62.1	-0.14179	ppb
|	Se	77			ppb
|	Se	82	638.7	0.45194	ppb
|>	Rh	103	1767718.6		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1571067.5		ppb
|	Tl	205			ppb
|-	Pb	208	132433.7	2.0306	ppb
	Kr	83	125.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 12:23:47
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1266870.4		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2043435		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	55976.2	0.99185	ppb
|	Cu	65	26424.8	1.02231	ppb
|	Zn	66	674350.4	57.76121	ppb
|	Zn	67	103832.7	54.17936	ppb
|	Zn	68	462843.5	53.78451	ppb
|	As	75	168.6	-0.13129	ppb
|	Se	77			ppb
|	Se	82	411.4	0.22353	ppb
|>	Rh	103	1815579.1		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb

|	Ba	137			ppb
|>	Ho	165	1604464.2		ppb
|	Tl	205			ppb
|-	Pb	208	141708.1	2.16067	ppb
	Kr	83	122.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 12:25:50
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1246162.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2025970.3		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	55329.3	1.00764	ppb
|	Cu	65	25670.7	1.01274	ppb
|	Zn	66	667878.9	58.51457	ppb
|	Zn	67	102524.6	54.72706	ppb
|	Zn	68	459699.7	54.6471	ppb
|	As	75	-704.3	-0.22195	ppb
|	Se	77			ppb
|	Se	82	390	0.21163	ppb
|>	Rh	103	1775253.8		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1581661.6		ppb
|	Tl	205			ppb
|-	Pb	208	141035.5	2.18786	ppb
	Kr	83	129.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 12:27:54
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1243008		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1969391.5		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	83626.4	1.74653	ppb
|	Cu	65	38896.9	1.76143	ppb
|	Zn	66	1254623	109.93868	ppb
|	Zn	67	187962.9	101.31655	ppb
|	Zn	68	862385.7	102.66098	ppb
|	As	75	53.3	-0.14302	ppb
|	Se	77			ppb
|	Se	82	616.3	0.42454	ppb
|>	Rh	103	1785446.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb

|>	Ho	165	1572391.6		ppb
|	Tl	205			ppb
|-	Pb	208	281739.8	5.09419	ppb
	Kr	83	131.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 12:29:57
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1282252.2		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2042038.1		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	1930048.6	49.85972	ppb
|	Cu	65	906075.7	50.75295	ppb
|	Zn	66	1773126.4	153.68207	ppb
|	Zn	67	276553.5	148.01762	ppb
|	Zn	68	1241761.5	146.29689	ppb
|	As	75	457957.3	46.85805	ppb
|	Se	77			ppb
|	Se	82	52267.5	48.84296	ppb
|>	Rh	103	1808368.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1611291.1		ppb
|	Tl	205			ppb
|-	Pb	208	2745788.8	54.32814	ppb
	Kr	83	135.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-4
Sample Dat Tuesday, October 03, 2017 12:32:01
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1249696.3		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2010002.6		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	72151.5	1.45922	ppb
|	Cu	65	33975	1.49558	ppb
|	Zn	66	1413913.9	125.0064	ppb
|	Zn	67	212285	115.61547	ppb
|	Zn	68	967250.7	116.1931	ppb
|	As	75	-38.8	-0.1527	ppb
|	Se	77			ppb
|	Se	82	215.5	0.0457	ppb
|>	Rh	103	1770838.7		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1582720		ppb

|	Tl	205			ppb
|-	Pb	208	261006.6	4.63399	ppb
	Kr	83	144		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-5
Sample Dat Tuesday, October 03, 2017 12:34:04
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1253988.2		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1971559.8		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	66338.4	1.3	ppb
|	Cu	65	30914.1	1.3149	ppb
|	Zn	66	1248013.1	110.0049	ppb
|	Zn	67	187819.3	101.86198	ppb
|	Zn	68	863304.8	103.39205	ppb
|	As	75	-169.6	-0.16529	ppb
|	Se	77			ppb
|	Se	82	201	0.03139	ppb
|>	Rh	103	1775302.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1577819.7		ppb
|	Tl	205			ppb
|-	Pb	208	238365.1	4.18721	ppb
	Kr	83	132.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7
Sample Dat Tuesday, October 03, 2017 12:38:12
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1361614.5		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2138611.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	121090.1	2.63021	ppb
|	Cu	65	56697.6	2.67319	ppb
|	Zn	66	157297.3	12.67248	ppb
|	Zn	67	26728.6	12.30081	ppb
|	Zn	68	130949.1	14.34736	ppb
|	As	75	59.2	-0.14253	ppb
|	Se	77			ppb
|	Se	82	449.2	0.25164	ppb
|>	Rh	103	1846700.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1851985.8		ppb
|	Tl	205			ppb

|-	Pb	208	113474.5	1.2875	ppb
	Kr	83	147.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 12:40:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1205139		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1887044.1		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	5386	-0.31487	ppb
|	Cu	65	2558.6	-0.31408	ppb
|	Zn	66	7568.7	-0.05317	ppb
|	Zn	67	2942.3	-0.22043	ppb
|	Zn	68	6207.3	-0.07899	ppb
|	As	75	-1129	-0.27084	ppb
|	Se	77			ppb
|	Se	82	95.7	-0.06662	ppb
|>	Rh	103	1727361.1		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1548187.4		ppb
|	Tl	205			ppb
|-	Pb	208	8653.7	-0.51065	ppb
	Kr	83	127.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 12:42:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1217051.9		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1955785.8		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3685155.7	98.52859	ppb
|	Cu	65	1715357.2	99.43576	ppb
|	Zn	66	1131594.2	100.79604	ppb
|	Zn	67	185098.1	101.4902	ppb
|	Zn	68	816613.3	98.84377	ppb
|	As	75	921425.9	97.29077	ppb
|	Se	77			ppb
|	Se	82	102152.2	98.50971	ppb
|>	Rh	103	1755188.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1581884.9		ppb
|	Tl	205			ppb
|-	Pb	208	5007866.2	101.5268	ppb

	Kr	83	128	ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7 FH
Sample Dat Tuesday, October 03, 2017 12:44:25
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1279331.3		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2161354.6		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	112255.7	2.48944	ppb
|	Cu	65	52780.7	2.54296	ppb
|	Zn	66	159884.4	13.29913	ppb
|	Zn	67	32565.4	15.91143	ppb
|	Zn	68	159491.7	18.20922	ppb
|	As	75	890.7	-0.05635	ppb
|	Se	77			ppb
|	Se	82	164.5	-0.00521	ppb
|>	Rh	103	1793439.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1766387.3		ppb
|	Tl	205			ppb
|-	Pb	208	130800	1.69982	ppb
	Kr	83	189.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-7 BH undig
Sample Dat Tuesday, October 03, 2017 12:46:28
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1008677.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1568112		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	37510.9	0.71207	ppb
|	Cu	65	17465	0.71952	ppb
|	Zn	66	49061.4	4.3859	ppb
|	Zn	67	7441.6	2.95281	ppb
|	Zn	68	34834.4	4.10582	ppb
|	As	75	147.1	-0.13034	ppb
|	Se	77			ppb
|	Se	82	356.3	0.2402	ppb
|>	Rh	103	1506510.1		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1439637		ppb
|	Tl	205			ppb
|-	Pb	208	31043.9	0.00511	ppb
	Kr	83	94.7		ppb

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8
Sample Dat Tuesday, October 03, 2017 12:48:32
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1325191.9		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2005310.8		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	102301.7	2.19647	ppb
|	Cu	65	48218.2	2.25074	ppb
|	Zn	66	130585.5	10.59201	ppb
|	Zn	67	21259.8	9.59798	ppb
|	Zn	68	97451.3	10.65929	ppb
|	As	75	1411.8	-0.0042	ppb
|	Se	77			ppb
|	Se	82	113.6	-0.05461	ppb
|>	Rh	103	1814730.4		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1811267.3		ppb
|	Tl	205			ppb
|-	Pb	208	83024	0.78878	ppb
	Kr	83	138.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8 FH
Sample Dat Tuesday, October 03, 2017 12:50:35
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1231078.6		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1879906.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	113813.9	2.65251	ppb
|	Cu	65	52602.7	2.65501	ppb
|	Zn	66	131375.3	11.26586	ppb
|	Zn	67	22937.1	11.16022	ppb
|	Zn	68	103520.5	12.02375	ppb
|	As	75	3870.6	0.26862	ppb
|	Se	77			ppb
|	Se	82	165	0.00185	ppb
|>	Rh	103	1723173.8		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1721677.9		ppb
|	Tl	205			ppb
|-	Pb	208	121514.1	1.5879	ppb
	Kr	83	167		ppb

Method 6020 & 200.8 Metals Summary Report

PerkinElmer ELAN 6100 ICP-MS

Sample ID: 30146-8 C8A
Sample Dat Tuesday, October 03, 2017 12:52:39
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	998366.4		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1527943.5		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	18934.9	0.12683	ppb
|	Cu	65	8972.8	0.13939	ppb
|	Zn	66	26972.1	2.05809	ppb
|	Zn	67	4161.3	0.8007	ppb
|	Zn	68	19956.9	1.97133	ppb
|	As	75	220.4	-0.12143	ppb
|	Se	77			ppb
|	Se	82	72.6	-0.07964	ppb
|>	Rh	103	1516237.4		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1445037.2		ppb
|	Tl	205			ppb
|-	Pb	208	19650.6	-0.25197	ppb
	Kr	83	99.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-8 C9
Sample Dat Tuesday, October 03, 2017 12:54:42
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1166348.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1756634.7		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	47093.5	0.86755	ppb
|	Cu	65	21960.5	0.87864	ppb
|	Zn	66	22227.9	1.35317	ppb
|	Zn	67	3404.1	0.10873	ppb
|	Zn	68	16626.3	1.28445	ppb
|	As	75	-178	-0.16825	ppb
|	Se	77			ppb
|	Se	82	65.6	-0.09404	ppb
|>	Rh	103	1670197.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1625153.1		ppb
|	Tl	205			ppb
|-	Pb	208	26442.9	-0.16575	ppb
	Kr	83	95		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-1

PerkinElmer ELAN 6100 ICP-MS

Sample Dat Tuesday, October 03, 2017 12:56:47
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1249967.8		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1976438.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	446041	11.13142	ppb
|	Cu	65	207776.5	11.24218	ppb
|	Zn	66	7253930.8	629.12198	ppb
|	Zn	67	1088735.5	586.50586	ppb
|	Zn	68	4970421.3	586.33277	ppb
|	As	75	3088.3	0.16768	ppb
|	Se	77			ppb
|	Se	82	3939.2	3.52074	ppb
|>	Rh	103	1813847		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1695171.6		ppb
|	Tl	205			ppb
|-	Pb	208	1288593.7	23.8515	ppb
	Kr	83	129.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 12:58:50
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1279517.3		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2029207.5		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	472070	11.75107	ppb
|	Cu	65	219421.3	11.84126	ppb
|	Zn	66	5474338.7	472.28992	ppb
|	Zn	67	821055.3	439.72095	ppb
|	Zn	68	3766257.1	441.97819	ppb
|	As	75	1216.6	-0.02476	ppb
|	Se	77			ppb
|	Se	82	2189.9	1.87629	ppb
|>	Rh	103	1822816		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1668925.7		ppb
|	Tl	205			ppb
|-	Pb	208	1376705.3	25.94355	ppb
	Kr	83	127.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-2
Sample Dat Tuesday, October 03, 2017 13:00:53

PerkinElmer ELAN 6100 ICP-MS

Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1271654.2		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2005780.7		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	467402.6	11.48215	ppb
|	Cu	65	217109.6	11.56286	ppb
|	Zn	66	5509858.5	469.60871	ppb
|	Zn	67	824876.3	436.38247	ppb
|	Zn	68	3780913.7	438.31693	ppb
|	As	75	1576.6	0.01003	ppb
|	Se	77			ppb
|	Se	82	2218.5	1.87788	ppb
|>	Rh	103	1844962.5		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1697600.2		ppb
|	Tl	205			ppb
|-	Pb	208	1367603.2	25.32065	ppb
	Kr	83	137.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 13:02:57
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1340713.8		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2072245.3		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	769806.5	18.96194	ppb
|	Cu	65	361474.5	19.30882	ppb
|	Zn	66	10264710.6	864.50885	ppb
|	Zn	67	1529774.6	800.63521	ppb
|	Zn	68	6991755.5	800.95778	ppb
|	As	75	3388.2	0.18782	ppb
|	Se	77			ppb
|	Se	82	3811.2	3.29767	ppb
|>	Rh	103	1868917.6		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1739810.1		ppb
|	Tl	205			ppb
|-	Pb	208	2868466.3	52.54711	ppb
	Kr	83	124		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-3
Sample Dat Tuesday, October 03, 2017 13:05:00
Sample De: CAE

PerkinElmer ELAN 6100 ICP-MS

Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1116150.8		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1776188.7		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	2675670.3	78.90142	ppb
|	Cu	65	1234063.9	78.88591	ppb
|	Zn	66	10565893.3	1046.1033	ppb
|	Zn	67	1587880.1	977.37903	ppb
|	Zn	68	7255184.8	977.13468	ppb
|	As	75	402479.2	46.84874	ppb
|	Se	77			ppb
|	Se	82	43557.3	46.29411	ppb
|>	Rh	103	1589828.4		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1462349.4		ppb
|	Tl	205			ppb
|-	Pb	208	5554669.2	121.9542	ppb
	Kr	83	139.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 13:07:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1183157.5		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1881008.6		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	4468.4	-0.33965	ppb
|	Cu	65	2097.8	-0.34102	ppb
|	Zn	66	13338.2	0.47653	ppb
|	Zn	67	3801.5	0.27264	ppb
|	Zn	68	10276.4	0.42924	ppb
|	As	75	-530.3	-0.20672	ppb
|	Se	77			ppb
|	Se	82	114.4	-0.04793	ppb
|>	Rh	103	1723968.8		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1531611.5		ppb
|	Tl	205			ppb
|-	Pb	208	7800.5	-0.52668	ppb
	Kr	83	122.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 13:09:09
Sample Description:
Concentration Results

PerkinElmer ELAN 6100 ICP-MS

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1235611.4		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1978351.8		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3703637.3	97.72797	ppb
|	Cu	65	1728312.9	98.87864	ppb
|	Zn	66	1136431.9	99.90931	ppb
|	Zn	67	184475.8	99.78336	ppb
|	Zn	68	813903.9	97.21236	ppb
|	As	75	925959.3	96.48333	ppb
|	Se	77			ppb
|	Se	82	103659.7	98.65768	ppb
|>	Rh	103	1778490.3		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1583071.7		ppb
|	Tl	205			ppb
|-	Pb	208	5020694.3	101.72001	ppb
	Kr	83	142.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-4
Sample Dat Tuesday, October 03, 2017 13:11:17
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1350236.1		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2154843.7		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	657056.9	15.7659	ppb
|	Cu	65	305697.1	15.90291	ppb
|	Zn	66	11611093.6	957.25764	ppb
|	Zn	67	1727128.1	884.92582	ppb
|	Zn	68	7932128.2	889.67091	ppb
|	As	75	2920	0.13478	ppb
|	Se	77			ppb
|	Se	82	837.9	0.58288	ppb
|>	Rh	103	1909177.8		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1748055.8		ppb
|	Tl	205			ppb
|-	Pb	208	2650866.8	48.27063	ppb
	Kr	83	142.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 30146-5
Sample Dat Tuesday, October 03, 2017 13:13:21
Sample De: CAE
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit

|>	Li	6	1326235.7		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	2105383		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	602946	14.58397	ppb
|	Cu	65	281544.8	14.76573	ppb
|	Zn	66	10403974.3	866.48089	ppb
|	Zn	67	1557204.4	806.08861	ppb
|	Zn	68	7140151.2	808.9979	ppb
|	As	75	2798.7	0.12682	ppb
|	Se	77			ppb
|	Se	82	921.1	0.66598	ppb
|>	Rh	103	1889418.2		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1730610.6		ppb
|	Tl	205			ppb
|-	Pb	208	2461123.5	45.23021	ppb
	Kr	83	125.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Tuesday, October 03, 2017 13:23:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1184686.5		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1901650.5		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3323.4	-0.3713	ppb
|	Cu	65	1552.8	-0.37371	ppb
|	Zn	66	21648.4	1.2306	ppb
|	Zn	67	5077.9	0.98951	ppb
|	Zn	68	16128.6	1.15197	ppb
|	As	75	-847.9	-0.23851	ppb
|	Se	77			ppb
|	Se	82	64.3	-0.09751	ppb
|>	Rh	103	1733026.4		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1552632.6		ppb
|	Tl	205			ppb
|-	Pb	208	6687	-0.55198	ppb
	Kr	83	131		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Dat Tuesday, October 03, 2017 13:25:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1229565		ppb

|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1979602.5		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	40242.6	0.59185	ppb
|	Cu	65	18954.9	0.61072	ppb
|	Zn	66	25173.8	1.45953	ppb
|	Zn	67	5823.5	1.28131	ppb
|	Zn	68	19046.7	1.41928	ppb
|	As	75	8998.1	0.77874	ppb
|	Se	77			ppb
|	Se	82	1129.4	0.90219	ppb
|>	Rh	103	1800777.1		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1603741.9		ppb
|	Tl	205			ppb
|-	Pb	208	55742.8	0.43135	ppb
	Kr	83	127.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Dat Tuesday, October 03, 2017 13:27:49
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens.	Conc. Mean	Report Unit
|>	Li	6	1230409.3		ppb
|-	Be	9			ppb
|-	P	31			ppb
|>	Sc	45	1975147.9		ppb
|	Cr	52			ppb
|-	Cr	53			ppb
|-	Co	59			ppb
|	Ni	60			ppb
|	Cu	63	3705453.8	97.98239	ppb
|	Cu	65	1737031.3	99.59348	ppb
|	Zn	66	1140600.1	100.49002	ppb
|	Zn	67	186070.1	100.89879	ppb
|	Zn	68	824197.6	98.68516	ppb
|	As	75	930212.7	97.14973	ppb
|	Se	77			ppb
|	Se	82	103418	98.63846	ppb
|>	Rh	103	1774601.9		ppb
|	Ag	107			ppb
|	Ag	109			ppb
|	Cd	111			ppb
|-	Cd	114			ppb
|-	Sb	121			ppb
|	Sb	123			ppb
|	Ba	135			ppb
|	Ba	137			ppb
|>	Ho	165	1589332.2		ppb
|	Tl	205			ppb
|-	Pb	208	5091184.2	102.74225	ppb
	Kr	83	145.7		ppb

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2	Cor. Coeff.
Calib Blank	9/26/2017	9:23:12 AM	0.00054153			µg			0.00055341			0.00052965			
STD1 = .004ug	9/26/2017	9:24:54 AM	0.00107063			µg			0.00110189			0.00103936			
STD2 = .04ug	9/26/2017	9:26:36 AM	0.01279507			µg			0.01286026			0.01272989			
STD3 = .08ug	9/26/2017	9:28:30 AM	0.02525169			µg			0.0253642			0.02513917			
STD4 = .16ug	9/26/2017	9:30:25 AM	0.04996901			µg			0.05033792			0.0496001			
STD5 = .2ug	9/26/2017	9:32:19 AM	0.06168409			µg			0.06218666			0.06118153			
Reagent Blank	9/26/2017	9:34:12 AM	-1.78E-05	-5.74E-05	-5.74E-05	µg			1.23E-05	3.98E-05	3.98E-05	-4.80E-05	-0.0001546	-0.0001546	
0.004ug = DL	9/26/2017	9:39:18 AM	0.00130419	0.00419805	0.00419805	µg			0.00130598	0.00420379	0.00420379	0.00130241	0.0041923	0.0041923	0.999884893
0.080ug = QC STD 3	9/26/2017	9:41:00 AM	0.02449119	0.07883443	0.07883443	µg			0.02445671	0.07872348	0.07872348	0.02452566	0.07894539	0.07894539	0.999884893
0.080ug = QC STD 2	9/26/2017	9:42:53 AM	0.02570306	0.08273531	0.08273531	µg			0.02601349	0.08373458	0.08373458	0.02539262	0.08173604	0.08173604	0.999884893
Reagent Blank	9/26/2017	9:44:45 AM	-9.80E-05	-0.0003156	-0.0003156	µg			-8.16E-05	-0.0002628	-0.0002628	-0.0001144	-0.0003683	-0.0003683	0.999884893
0.004ug = DL	9/26/2017	10:29:42 AM	0.00124591	0.00401044	0.00401044	µg			0.00126396	0.00406855	0.00406855	0.00122785	0.00395233	0.00395233	0.999884893
0.080ug = QC STD 2	9/26/2017	10:31:25 AM	0.02467041	0.07941132	0.07941132	µg			0.02467348	0.07942122	0.07942122	0.02466733	0.07940143	0.07940143	0.999884893
Reagent Blank	9/26/2017	10:33:18 AM	-2.46E-05	-7.92E-05	-7.92E-05	µg			-1.54E-05	-4.97E-05	-4.97E-05	-3.38E-05	-0.0001087	-0.0001087	0.999884893
30146-1 BH	9/26/2017	10:46:23 AM	-2.64E-05	-2.76E-05	-0.0026216	µg	4	380	-5.92E-05	-0.0001331	-0.0126415	6.36E-06	7.79E-05	0.00739831	0.999884893
30146-2 BH	9/26/2017	10:48:07 AM	-6.26E-05	-0.0001441	-0.0142341	µg	4	395	-3.54E-05	-5.66E-05	-0.0055858	-8.98E-05	-0.0002317	-0.0228823	0.999884893
30146-2 BH DUP	9/26/2017	10:49:51 AM	-7.34E-05	-0.0001789	-0.0176649	µg	4	395	-8.20E-05	-0.0002064	-0.0203834	-6.49E-05	-0.0001514	-0.0149463	0.999884893
0.004ug = DL	9/26/2017	10:53:17 AM	0.00119063	0.00383251	0.00383251	µg			0.00119077	0.00383296	0.00383296	0.00119049	0.00383206	0.00383206	0.999884893
0.080ug = QC STD 2	9/26/2017	10:54:59 AM	0.0240069	0.07727556	0.07727556	µg			0.02383273	0.07671493	0.07671493	0.02418106	0.07783618	0.07783618	0.999884893
Reagent Blank	9/26/2017	10:56:52 AM	-0.0003388	-0.0010906	-0.0010906	µg			-0.0003409	-0.0010974	-0.0010974	-0.0003367	-0.0010839	-0.0010839	0.999884893
0.004ug = DL	9/26/2017	11:25:41 AM	0.00121321	0.00390519	0.00390519	µg			0.00126697	0.00407825	0.00407825	0.00115945	0.00373213	0.00373213	0.999884893
0.080ug = QC STD 3	9/26/2017	11:27:24 AM	0.02386479	0.07681814	0.07681814	µg			0.02383617	0.07672601	0.07672601	0.02389341	0.07691027	0.07691027	0.999884893
0.080ug = QC STD 2	9/26/2017	11:29:17 AM	0.02500597	0.08049148	0.08049148	µg			0.02523184	0.08121852	0.08121852	0.02478011	0.07976444	0.07976444	0.999884893
Reagent Blank	9/26/2017	11:31:09 AM	-0.0003051	-0.0009822	-0.0009822	µg			-0.0003259	-0.0010491	-0.0010491	-0.0002844	-0.0009153	-0.0009153	0.999884893
30146-3 BH	9/26/2017	11:32:51 AM	-0.0001332	0.00049126	0.05035414	µg	4	410	-0.0001339	0.00048915	0.05013811	-0.0001326	0.00049337	0.05057017	0.999884893
30146-3 BH SPK	9/26/2017	11:34:34 AM	0.02352064	0.07663044	7.85461975	µg	4	410	0.02350257	0.07657228	7.84865852	0.02353871	0.07668859	7.86058097	0.999884893
30146-4 BH	9/26/2017	11:36:28 AM	-0.0002972	-3.65E-05	-0.0038328	µg	4	420	-0.0003029	-5.51E-05	-0.0057822	-0.0002914	-1.79E-05	-0.0018834	0.999884893
30146-5 BH	9/26/2017	11:38:11 AM	-0.0003141	-9.09E-05	-0.009208	µg	4	405	-0.0003312	-0.0001459	-0.0147741	-0.000297	-3.60E-05	-0.0036419	0.999884893
30146-7 BH	9/26/2017	11:41:36 AM	-0.0003321	-0.0001489	-0.0126538	µg	4	340	-0.0003509	-0.0002095	-0.0178098	-0.0003132	-8.82E-05	-0.0074978	0.999884893
30146-8 BH	9/26/2017	11:43:19 AM	-0.0002986	-4.10E-05	-0.0019481	µg	4	190	-0.000297	-3.58E-05	-0.0017019	-0.0003002	-4.62E-05	-0.0021943	0.999884893
30146-1 A	9/26/2017	11:45:02 AM	-0.0004241	-0.0004451	-0.022255	µg	4	200	-0.0004246	-0.0004467	-0.0223333	-0.0004236	-0.0004435	-0.0221767	0.999884893
30146- 2 A	9/26/2017	11:46:46 AM	-0.0004188	-0.0004278	-0.0213917	µg	4	200	-0.0004319	-0.00047	-0.0234996	-0.0004057	-0.0003857	-0.0192838	0.999884893
30146-2 A DUP	9/26/2017	11:48:30 AM	-0.0004428	-0.0005053	-0.0252628	µg	4	200	-0.0004653	-0.0005776	-0.0288787	-0.0004203	-0.0004329	-0.0216469	0.999884893
0.004ug = DL	9/26/2017	11:51:55 AM	0.00120328	0.00387323	0.00387323	µg			0.00124312	0.00400147	0.00400147	0.00116344	0.003745	0.003745	0.999884893
0.080ug = QC STD 2	9/26/2017	11:53:37 AM	0.0241786	0.07782826	0.07782826	µg			0.0242249	0.0779773	0.0779773	0.0241323	0.07767922	0.07767922	0.999884893
Reagent Blank	9/26/2017	11:55:29 AM	-0.0003381	-0.0010883	-0.0010883	µg			-0.0003425	-0.0011026	-0.0011026	-0.0003337	-0.001074	-0.001074	0.999884893
30146-3 A	9/26/2017	11:57:13 AM	-0.0004244	-0.0004459	-0.0222971	µg	4	200	-0.0004179	-0.0004251	-0.0212568	-0.0004308	-0.0004667	-0.0233374	0.999884893
30146-3 A SPK	9/26/2017	11:58:57 AM	0.02306124	0.07515168	3.75758377	µg	4	200	0.02306657	0.07516884	3.75844203	0.02305591	0.07513451	3.75672551	0.999884893
30146-4 A	9/26/2017	12:00:52 PM	-0.0004211	-0.0004354	-0.0217723	µg	4	200	-0.0004353	-0.0004811	-0.0240536	-0.0004069	-0.0003898	-0.0194909	0.999884893
30146-5 A	9/26/2017	12:02:35 PM	-0.0004274	-0.0004557	-0.0227861	µg	4	200	-0.000425	-0.0004481	-0.0224043	-0.0004298	-0.0004634	-0.0231679	0.999884893
30146-7 A	9/26/2017	12:06:03 PM	-0.0004303	-0.0004649	-0.0232462	µg	4	200	-0.0004234	-0.0004429	-0.0221464	-0.0004371	-0.0004869	-0.024346	0.999884893
30146-8 A	9/26/2017	12:07:46 PM	-0.000427	-0.0004542	-0.022712	µg	4	200	-0.0004123	-0.0004071	-0.0203569	-0.0004416	-0.0005013	-0.025067	0.999884893
30146-1 B	9/26/2017	12:09:29 PM	0.02819717	0.09168368	11.4604602	µg	4	500	0.02821331	0.09173564	11.4669554	0.02818103	0.09163172	11.453965	0.999884893
30146-2 B	9/26/2017	12:11:23 PM	0.02421465	0.07886437	9.85804636	µg	4	500	0.02452451	0.0798618	9.98272497	0.02390478	0.07786694	9.73336775	0.999884893
30146-2 B DUP	9/26/2017	12:13:17 PM	0.02390053	0.07785328	9.73165961	µg	4	500	0.02394983	0.07801195	9.75149339	0.02385124	0.07769461	9.71182583	0.999884893
0.004ug = DL	9/26/2017	12:18:36 PM	0.00121776	0.00391983	0.00391983	µg			0.00120572	0.00388108	0.00388108	0.0012298	0.00395858	0.00395858	0.999884893
0.080ug = QC STD 2	9/26/2017	12:20:18 PM	0.02307326	0.0742703	0.0742703	µg			0.02304822	0.07418968	0.07418968	0.02309831	0.07435092	0.07435092	0.999884893
Reagent Blank	9/26/2017	12:22:11 PM	-0.0003689	-0.0011873	-0.0011873	µg			-0.0003706	-0.001193	-0.001193	-0.0003671	-0.0011816	-0.0011816	0.999884893
30146-3 B	9/26/2017	12:23:54 PM	0.05414306	0.17520066	21.9000819	µg	4	500	0.0543236	0.17578177	21.9727215	0.05396253	0.17461954	21.8274424	0.999884893
30146-3 B SPK	9/26/2017	12:25:49 PM	0.07399369	0.23909765	29.8872057	µg	4	500	0.07395566	0.23897523	29.8719035	0.07403172	0.23922006	29.9025079	0.999884893
30146-4 B	9/26/2017	12:27:45 PM	0.05931304	0.19184225	23.9802809	µg	4	500	0.05931994	0.19186445	23.9830564	0.05930614	0.19182004	23.9775053	0.999884893
30146-7 B	9/26/2017	12:33:30 PM	-0.0004001	-0.0003677	-0.0459607	µg	4	500	-0.0004159	-0.0004188	-0.0523471	-0.0003842	-0.0003166	-0.0395743	0.999884893
30146-8 B	9/26/2017	12:35:14 PM	-0.000431	-0.0004673	-0.0584065	µg	4	500	-0.0004112	-0.0004034	-0.0504293	-0.0004508	-0.0005311	-0.0663837	0.999884893
0.004ug = DL	9/26/2017	12:36:57 PM	0.00115554	0.00371956	0.00371956	µg			0.00115909	0.00373098	0.00373098	0.00115199	0.00370814	0.00370814	0.999884893
0.080ug = QC STD 3	9/26/2017	12:42:27 PM	0.02267566	0.07299045	0.07299045	µg			0.02285221	0.07355874	0.07355874	0.02249911	0.07242216	0.07242216	0.999884893
Reagent Blank	9/26/2017	12:44:21 PM	-0.000364	-0.0011716	-0.0011716	µg			-0.0003597	-0.0011578	-0.0011578	-0.0003683	-0.0011855	-0.0011855	0.999884893
Calib Blank	9/27/2017	10:02:03 AM	0.00044807			µg			0.00037451			0.00052163			
STD1 = .004ug	9/27/2017	10:03:45 AM	0.00161273			µg			0.00164134			0.00158411			
STD2 = .04ug	9/27/2017	10:05:27 AM	0.01554558			µg			0.01558575			0.0155054			
STD3 = .08ug	9/27/2017	10:07:22 AM	0.032843			µg			0.03276524			0.03292077			
STD4 = .16ug	9/27/2017	10:09:16 AM	0.0646191			µg			0.06437302			0.06486518			
STD5 = .2ug	9/27/2017	10:11:10 AM	0.08240249			µg			0.08224866			0.08255632			
Reagent Blank	9/27/2017	10:13:02 AM	-2.43E-05	-5.95E-05	-5.95E-05	µg			1.45E-05	3.54E-05	3.54E-05	-6.31E-05	-0.0001544	-0.0001544	
0.004ug = DL	9/27/2017	10:14:44 AM	0.00166254	0.00406888	0.00406888	µg			0.00168703	0.00412881	0.00412881	0.00163805	0.00400895	0.00400895	0.999809687
0.080ug = QC STD 3	9/27/2017	10:16:27 AM	0.03373164	0.08255437	0.08255437	µg			0.03378183	0.0826772	0.0826772	0.03368145	0.08243154	0.08243154	0.999809687
0.080ug = QC STD 2	9/27/2017	10:18:20 AM	0.03246104	0.07944471	0.07944471	µg			0.03261153	0.07981303	0.07981303	0.03231054	0.0790764	0.0790764	0.999809687
Reagent Blank	9/27/2017	10:20:13 AM	-7.42E-05	-0.0001817	-0.0001817	µg			-0.0001036	-0.0002537	-0.0002537	-4.48E-05	-0.0001097	-0.0001097	0.999809687
0.004ug = DL	9/27/2017	12:12:46 PM	0.00170946	0.0041837	0.0041837	µg			0.00172059	0.00421094	0.00421094	0.00169832	0.00415645	0.00415645	0.999809687
0.080ug = QC STD 2	9/27/2017	12:14:27 PM	0.03296747	0.08068416	0.08068416	µg			0.03292472	0.08057951	0.08057951	0.03301023	0.0807888	0.0807888	0.999809687
Reagent Blank	9/27/2017	12:16:20 PM	-3.54E-05	-8.67E-05	-8.67E-05	µg			-8.84E-05	-0.0002163	-0.0002163	1.75E-05	4.29E-05	4.29E-05	0.999809687
30146-1 C	9/27/2017	12:21:52 PM	0.07916308	0.19380218	19.3802181	µg	4	400	0.07894221	0.19326161	19.3261605	0.07938396	0.19434276	19.4342758	0.999809687
30146-2 C	9/27/2017	12:23:47 PM	0.06924175	0.16952083	16.952083	µg	4	400	0.06903312	0.16901023	16.9010229	0.06945038	0.17003143	17.0031431	0.999809687
30146-2 C DUP	9/27/2017	12:25:41 PM	0.06959763	0.17039181	17.0391811	µg	4	400	0.06973504	0.17072812	17.0728121	0.06946021	0.1700555	17.00555	0.999809687
0.004ug = DL	9/27/2017	12:37:06 PM	0.00177981	0.00435587	0.00435587	µg			0.00181076	0.00443164	0.00443164	0.00174885	0.00428011	0.00428011	0.999809687
0.080ug = QC STD 2	9/27/2017	12:38:48 PM	0.03357676	0.08217532	0.08217532	µg			0.03352001	0.08203643	0.08203643	0.03363352	0.08231422	0.08231422	0.999809687
Reagent Blank	9/27/2017	12:40:41 PM	2.16E-05	5.28E-05	5.28E-05	µg			5.87E-06	1.44E-05	1.44E-05	3.73E-05	9.13E-05	9.13E-05	0.999809687
30146-7 C	9/27/2017	12:42:23 PM	-0.0002111	-0.0004572	-0.0457224	µg	4	400	-0.0002361	-0.0005184	-0.0518445	-0.0001861	-0.000396	-0.0396003	0.999809687
30146-8 C	9/27/2017	12:44:06 PM	-0.0002356	-0.0005172	-0.0517205	µg	4	400	-0.0002002	-0.0004305	-0.0430496	-0.0002711	-0.0006039	-0.0603914	0.999809687
30146-5 B	9/27/2017	12:45:50 PM	0.05541909	0.13569145	67.8457266	µg	1	500	0.05533413	0.1354835	67.7417514	0.05550406	0.1358994	67.9497018	0.999809687
0.004ug = DL	9/27/2017	1:00:02 PM	0.00171646	0.00420085	0.00420085	µg			0.00170543	0.00417386	0.00417386	0.00172749	0.00422784	0.00422784	0.999809687
0.080ug = QC STD 2	9/27/2017	1:01:44 PM	0.03371624	0.08251668	0.08251668	µg			0.03383475	0.08280673	0.08280673	0.03359773	0.08222664	0.08222664	0.999809687
Reagent Blank	9/27/2017	1:03:36 PM	-2.26E-05	-5.52E-05	-5.52E-05	µg			-6.47E-06	-1.58E-05	-1.58E-05	-3.87E-05	-9.46E-05	-9.46E-05	0.999809687
Calib Blank	9/28/2017	10:14:03 AM	0.00018484			µg			0.00015623			0.00021345			
STD1 = .004ug	9/28/2017	10:15:45 AM	0.00113344			µg			0.00108881			0.00117807			
STD2 = .04ug	9/28/2017	10:17:28 AM	0.01035963			µg			0.01050804			0.01021121			
STD3 = .08ug	9/28/2017	10:19:23 AM	0.0214321			µg			0.02131929			0.0215449			
STD4 = .16ug	9/28/2017	10:21:18 AM	0.0420836			µg			0.04198229			0.04218491			
STD5 = .2ug	9/28/2017	10:23:13 AM	0.05220041			µg			0.05185435			0.05254648			
Reagent Blank	9/28/2017	10:25:06 AM	-8.51E-06	-3.24E-05	-3.24E-05	µg			-2.32E-05	-8.84E-05	-8.84E-05	6.18E-06	2.36E-05	2.36E-05	

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2	Cor. Coeff.
0.004ug = DL	9/28/2017	10:26:48 AM	0.00115955	0.004421	0.004421	µg			0.00116644	0.0044473	0.0044473	0.00115265	0.00439469	0.00439469	0.999916874
0.004ug = DL	9/28/2017	10:28:31 AM	0.00108513	0.00413728	0.00413728	µg			0.00108531	0.00413798	0.00413798	0.00108495	0.00413658	0.00413658	0.999916874
0.080ug = QC STD 2	9/28/2017	10:30:13 AM	0.02198052	0.0838051	0.0838051	µg			0.02200521	0.08389922	0.08389922	0.02195584	0.08371097	0.08371097	0.999916874
Reagent Blank	9/28/2017	10:32:06 AM	-6.38E-05	-0.0002433	-0.0002433	µg			-4.42E-05	-0.0001687	-0.0001687	-8.34E-05	-0.000318	-0.000318	0.999916874
0.004ug = DL	9/28/2017	12:00:19 PM	0.00095931	0.00365758	0.00365758	µg			0.00094144	0.00358941	0.00358941	0.00097719	0.00372574	0.00372574	0.999916874
0.080ug = QC STD 2	9/28/2017	12:02:02 PM	0.02082521	0.07940025	0.07940025	µg			0.02073642	0.07906169	0.07906169	0.02091401	0.07973881	0.07973881	0.999916874
Reagent Blank	9/28/2017	12:03:54 PM	-2.01E-05	-7.65E-05	-7.65E-05	µg			-8.41E-07	-3.21E-06	-3.21E-06	-3.93E-05	-0.0001498	-0.0001498	0.999916874
30146-3 C	9/28/2017	12:07:22 PM	0.02003107	0.07640485	30.5619415	µg	1	400	0.02017181	0.07694147	30.7765886	0.01989032	0.07586824	30.3472945	0.999916874
30146-3 C SPK	9/28/2017	12:09:18 PM	0.04033936	0.15383422	61.5336876	µg	1	400	0.0401405	0.15307602	61.2304077	0.04053822	0.15459242	61.8369675	0.999916874
30146-4 C	9/28/2017	12:11:13 PM	0.02872249	0.1095426	43.8170385	µg	1	400	0.0287029	0.10946792	43.787166	0.02874207	0.10961728	43.846911	0.999916874
30146-5 C	9/28/2017	12:13:08 PM	0.02434373	0.09284773	74.2781862	µg	0.5	400	0.02409096	0.09188399	73.5071904	0.0245965	0.09381148	75.049182	0.999916874
0.004ug = DL	9/28/2017	12:26:08 PM	0.00103684	0.00395316	0.00395316	µg			0.00109133	0.00416091	0.00416091	0.00098235	0.00374541	0.00374541	0.999916874
0.080ug = QC STD 3	9/28/2017	12:27:51 PM	0.02023221	0.07713931	0.07713931	µg			0.02030328	0.07741027	0.07741027	0.02016114	0.07686835	0.07686835	0.999916874
Reagent Blank	9/28/2017	12:29:45 PM	-0.0001218	-0.0004644	-0.0004644	µg			-0.0001054	-0.000402	-0.000402	-0.0001382	-0.0005269	-0.0005269	0.999916874
Calib Blank	9/29/2017	8:46:27 AM	0.00022049			µg			0.00015155			0.00028942			
STD1 = .004ug	9/29/2017	8:48:09 AM	0.00164578			µg			0.00167651			0.00161504			
STD2 = .04ug	9/29/2017	8:49:52 AM	0.01823703			µg			0.01841366			0.01806041			
STD3 = .08ug	9/29/2017	8:51:46 AM	0.03636736			µg			0.03659108			0.03614364			
STD4 = .16ug	9/29/2017	8:53:41 AM	0.07162474			µg			0.07208109			0.07116839			
STD5 = .2ug	9/29/2017	8:55:35 AM	0.09230313			µg			0.09291165			0.0916946			
Reagent Blank	9/29/2017	8:57:27 AM	7.37E-05	0.0001616	0.0001616	µg			3.72E-05	8.15E-05	8.15E-05	0.00011022	0.00024168	0.00024168	
0.004ug = DL	9/29/2017	8:59:09 AM	0.0017613	0.00386205	0.00386205	µg			0.00176706	0.0038747	0.0038747	0.00175553	0.00384941	0.00384941	0.999726479
0.080ug = QC STD 3	9/29/2017	9:00:51 AM	0.03738256	0.08196997	0.08196997	µg			0.03769349	0.08265177	0.08265177	0.03707162	0.08128817	0.08128817	0.999726479
0.080ug = QC STD 2	9/29/2017	9:04:38 AM	0.03744744	0.08211224	0.08211224	µg			0.03771983	0.08270952	0.08270952	0.03717505	0.08151495	0.08151495	0.999726479
Reagent Blank	9/29/2017	9:06:30 AM	-1.05E-06	-2.30E-06	-2.30E-06	µg			1.57E-05	3.43E-05	3.43E-05	-1.78E-05	-3.89E-05	-3.89E-05	0.999726479
30146-LRB	9/29/2017	9:11:50 AM	-2.56E-05	-0.0002178	-0.0054444	µg	4	100	-1.74E-05	-0.0001997	-0.0049925	-3.39E-05	-0.0002359	-0.0058963	0.999726479
30146-LRB SPK	9/29/2017	9:13:34 AM	0.08816497	0.19316064	4.82901604	µg	4	100	0.08933436	0.19572479	4.89311987	0.08699558	0.19059649	4.76491221	0.999726479
30146-1 FH	9/29/2017	9:15:29 AM	0.00107598	0.00219773	0.05494319	µg	4	100	0.00102316	0.00208192	0.05204803	0.00112879	0.00231353	0.05783835	0.999726479
30146-2 FH	9/29/2017	9:17:12 AM	0.00240209	0.00510554	0.1276384	µg	4	100	0.00237285	0.00504143	0.1260357	0.00243132	0.00516964	0.12924111	0.999726479
30146-2 FH DUP	9/29/2017	9:18:54 AM	0.00232334	0.00493287	0.12332171	µg	4	100	0.0023319	0.00495164	0.12379097	0.00231478	0.0049141	0.12285246	0.999726479
30146-3 FH	9/29/2017	9:20:35 AM	0.00252037	0.00536491	0.13412272	µg	4	100	0.00253644	0.00540014	0.13500361	0.00250431	0.00532967	0.13324182	0.999726479
30146-3 FH SPK	9/29/2017	9:22:17 AM	0.03724971	0.08151708	2.03792699	µg	4	100	0.03734499	0.081726	2.04314996	0.03715444	0.08130816	2.03270402	0.999726479
30146-4 FH	9/29/2017	9:24:10 AM	0.00199334	0.00420926	0.10523155	µg	4	100	0.00200136	0.00422684	0.10567107	0.00198532	0.00419168	0.10479204	0.999726479
0.004ug = DL	9/29/2017	9:25:51 AM	0.00175077	0.00383897	0.00383897	µg			0.00166451	0.00364982	0.00364982	0.00183703	0.00402812	0.00402812	0.999726479
0.080ug = QC STD 2	9/29/2017	9:27:33 AM	0.04002414	0.08776225	0.08776225	µg			0.04017506	0.08809318	0.08809318	0.03987322	0.08743132	0.08743132	0.999726479
Reagent Blank	9/29/2017	9:29:25 AM	4.54E-06	9.95E-06	9.95E-06	µg			-5.09E-05	-0.0001116	-0.0001116	6.00E-05	0.00013151	0.00013151	0.999726479
30146-5 FH	9/29/2017	9:31:06 AM	0.00371279	0.00797957	0.19948917	µg	4	100	0.00373775	0.0080343	0.20085745	0.00368783	0.00792484	0.19812089	0.999726479
30146-7 FH	9/29/2017	9:34:31 AM	2.29E-05	-0.0001114	-0.0027852	µg	4	100	1.24E-05	-0.0001343	-0.003358	3.33E-05	-8.85E-05	-0.0022124	0.999726479
30146-8 FH	9/29/2017	9:36:14 AM	-4.36E-05	-0.0002573	-0.0064325	µg	4	100	1.21E-05	-0.000135	-0.0033754	-9.94E-05	-0.0003796	-0.0094897	0.999726479
0.004ug = DL	9/29/2017	9:48:58 AM	0.00168872	0.00370291	0.00370291	µg			0.0016368	0.00358907	0.00358907	0.00174063	0.00381675	0.00381675	0.999726479
0.080ug = QC STD 2	9/29/2017	9:50:40 AM	0.03965871	0.08696096	0.08696096	µg			0.03982677	0.08732948	0.08732948	0.03949065	0.08659245	0.08659245	0.999726479
Reagent Blank	9/29/2017	9:52:33 AM	-6.49E-05	-0.0001423	-0.0001423	µg			-4.16E-05	-9.12E-05	-9.12E-05	-8.82E-05	-0.0001934	-0.0001934	0.999726479
Calib Blank	10/2/2017	10:58:32 AM	0.0008095			µg			0.00084134			0.00077765			
STD1 = .004ug	10/2/2017	11:00:14 AM	0.0013416			µg			0.00142726			0.00125595			
STD2 = .04ug	10/2/2017	11:01:57 AM	0.01350797			µg			0.01357091			0.01344502			
STD3 = .08ug	10/2/2017	11:03:52 AM	0.02768094			µg			0.02778824			0.02757364			
STD4 = .16ug	10/2/2017	11:05:47 AM	0.05358614			µg			0.05380961			0.05336266			
STD5 = .2ug	10/2/2017	11:07:40 AM	0.06745673			µg			0.06776452			0.06714893			
Reagent Blank	10/2/2017	11:09:33 AM	2.95E-05	8.76E-05	8.76E-05	µg			2.59E-05	7.67E-05	7.67E-05	3.32E-05	9.85E-05	9.85E-05	
0.004ug = DL	10/2/2017	11:11:14 AM	0.00127745	0.00378782	0.00378782	µg			0.00131622	0.00390277	0.00390277	0.00123868	0.00367286	0.00367286	0.99989627
0.080ug = QC STD 3	10/2/2017	11:12:56 AM	0.02793286	0.08282483	0.08282483	µg			0.02827745	0.08384658	0.08384658	0.02758828	0.08180309	0.08180309	0.99989627
0.080ug = QC STD 2	10/2/2017	11:14:50 AM	0.02782096	0.08249302	0.08249302	µg			0.02815791	0.08349213	0.08349213	0.02748401	0.08149392	0.08149392	0.99989627
Reagent Blank	10/2/2017	11:16:43 AM	-5.47E-05	-0.0001622	-0.0001622	µg			-0.0001037	-0.0003074	-0.0003074	-5.76E-06	-1.71E-05	-1.71E-05	0.99989627
0.004ug = DL	10/2/2017	11:36:00 AM	0.00136583	0.00404989	0.00404989	µg			0.00139692	0.00414208	0.00414208	0.00133474	0.0039577	0.0039577	0.99989627
0.080ug = QC STD 2	10/2/2017	11:37:42 AM	0.02734481	0.08108118	0.08108118	µg			0.02738134	0.08118951	0.08118951	0.02730828	0.08097285	0.08097285	0.99989627
Reagent Blank	10/2/2017	11:39:35 AM	2.09E-05	6.19E-05	6.19E-05	µg			-7.24E-06	-2.15E-05	-2.15E-05	4.90E-05	0.00014536	0.00014536	0.99989627
30146-LRB	10/2/2017	11:57:24 AM	0.00017212	0.00042275	0.01056885	µg	4	100	0.00016546	0.000403	0.01007505	0.00017878	0.00044251	0.01106266	0.99989627
0.004ug = DL	10/2/2017	11:59:07 AM	0.00135076	0.00400519	0.00400519	µg			0.00135587	0.00402033	0.00402033	0.00134565	0.00399005	0.00399005	0.99989627
0.080ug = QC STD 2	10/2/2017	12:00:49 PM	0.02715437	0.08051649	0.08051649	µg			0.02718239	0.08059957	0.08059957	0.02712635	0.08043341	0.08043341	0.99989627
Reagent Blank	10/2/2017	12:02:41 PM	0.00010613	0.00031469	0.00031469	µg			0.00012637	0.0003747	0.0003747	8.59E-05	0.00025467	0.00025467	0.99989627
30146-LRB SPK	10/2/2017	12:04:24 PM	0.02533906	0.07504626	4.69039134	µg	1.6	100	0.02535274	0.07508681	4.69292533	0.02532539	0.07500572	4.68785736	0.99989627
0.004ug = DL	10/2/2017	12:13:42 PM	0.00133171	0.00394871	0.00394871	µg			0.00139051	0.00412305	0.00412305	0.00127291	0.00377437	0.00377437	0.99989627
0.080ug = QC STD 3	10/2/2017	12:15:24 PM	0.02715315	0.08051288	0.08051288	µg			0.02721954	0.08070973	0.08070973	0.02708676	0.08031603	0.08031603	0.99989627
Reagent Blank	10/2/2017	12:17:17 PM	-4.23E-05	-0.0001253	-0.0001253	µg			-2.60E-05	-7.72E-05	-7.72E-05	-5.85E-05	-0.0001734	-0.0001734	0.99989627

Atmospheric Analysis & Consulting, Inc.

CLIENT : CleanAir Engineering
PROJECT NAME : SIMS Metal Management
PROJECT NUMBER : 13318
AAC PROJECT NO. : 171450
REPORT DATE : 09/25/2017

On September 19, 2017, Atmospheric Analysis & Consulting, Inc. received four (4) Six-Liter Summa Canisters for Volatile Organic Compounds analysis by EPA method TO-15. Upon receipt each sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab ID	Return Pressure (mmHga)
TTE Exhaust Run No.1	171450-103294	559.3
TTE Exhaust Run No.2	171450-103298	559.9
TTE Exhaust Run No.3	171450-103302	571.2
TTE Exhaust Run No.4	171450-103306	573.2

All of the analyses mentioned above were performed in accordance with AAC's ISO/IEC 17025:2005 and NELAP approved Quality Assurance Plan. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at www.aaclab.com.

I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of these samples. The Laboratory Director or his/her designee, as verified by the following signature, has authorized release of the data contained in this hardcopy report.

If you have any questions or require further explanation of data results, please contact the undersigned.

Marcus Hueppe
Laboratory Director

This report consists of 83 pages.

1534 Eastman Ave., Ste. A • Ventura, • CA 93003 www.aaclab.com • (805) 650-1642 • FAX (805) 650-1644

Atmospheric Analysis & Consulting, Inc.

SAMPLE RECEIPT / LOG-IN REPORT

AAC Project No: 171450 **Received By: W.Schneider**

Sample Receipt Date	Project Desc	Clients ID	Matrix	Sampling Date/Time	Sampled By	Sample #	Analysis Requested
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 1	Summa Canister	09/15/2017	Client	103294	TO15 Tics
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 1	Silica Gel Tube	09/15/2017	Client	103295	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 1 Imp 1	Liquid	09/15/2017	Client	103296	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 1 Imp 2 & 3	Liquid	09/15/2017	Client	103297	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 2	Summa Canister	09/15/2017	Client	103298	TO15 Tics
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 2	Silica Gel Tube	09/15/2017	Client	103299	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 2 Imp 1	Liquid	09/15/2017	Client	103300	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 2 Imp 2 & 3	Liquid	09/15/2017	Client	103301	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 3	Summa Canister	09/18/2017	Client	103302	TO15 Tics
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 3	Silica Gel Tube	09/18/2017	Client	103303	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 3 Imp 1	Liquid	09/18/2017	Client	103304	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 3 Imp 2 & 3	Liquid	09/18/2017	Client	103305	Sub-contract

SAMPLE RECEIPT / LOG-IN REPORT

AAC Project No: 171450 **Received By: W.Schneider**

Sample Receipt Date	Project Desc	Clients ID	Matrix	Sampling Date/Time	Sampled By	Sample #	Analysis Requested
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 4	Summa Canister	09/18/2017	Client	103306	TO15 Tics
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 4	Silica Gel Tube	09/18/2017	Client	103307	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 4 Imp 1	Liquid	09/18/2017	Client	103308	Sub-contract
09/19/2017 0955	Clean Air Engineering Sims Metal Management	TTE Exhaust Run No. 4 Imp 2 & 3	Liquid	09/18/2017	Client	103309	Sub-contract

TURN AROUND TIME: Normal (10days)

Lab Due Date: 09/26/2017

Total Samples: 16

REMARKS:
Client returned 4x cans, no flows.

Samples received at 0.2°C.

Atmospheric Analysis & Consulting, Inc.

CANISTER PRESSURE LOG

Client: Clean Air Engineering

Project No.: 171450

Date: 09/19/2017

Canister #	Sample #	Initial Pressure mmHg	Final Pressure mmHg
697	103294	559.3	1031.5
901	103298	559.9	1016.1
809	103302	571.2	1040.8
896	103306	573.2	1020.9

1

#171450

CLIENT: SIMS Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

66-13318-4

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
TO-15	SEE BELOW (IF APPLICABLE)	Summa Canister

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

FORWARDING LAB
AAC
1534 Eastman Avenue Suite A
Ventura, CA 93003
(805) 650-1642
Marcus Hueppe

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: TO-15			Archive	ADDITIONAL INFORMATION
103294	9/15	TTE Exhaust	1	Summa Canister 3951	1		X				
103298	9/15	TTE Exhaust	2	Summa Canister 19788	1		X				See Methodology sent with
103302	9/18	TTE Exhaust	3	Summa Canister 4747	1		X				original request for analysis
103306	9/18	TTE Exhaust	4	Summa Canister 16815	1		X				

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
B. Ansell	9/18/17 2:00 PM					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
					9/19/17 9:35	9/21/2017

4x CAN, NO FLOW FEDEX 0.2°C

TO-15 REPORTS

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : **CleanAir Engineering**
PROJECT NO : **171450**
MATRIX : **AIR**
UNITS : **PPB (v/v)**

DATE RECEIVED : **09/19/2017**
DATE REPORTED : **09/25/2017**

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.1			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.2			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171450-103294				171450-103298				
Date Sampled	09/15/2017				09/15/2017				
Date Analyzed	09/21/2017				09/21/2017				
Can Dilution Factor	1.84				1.81				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Chlorodifluoromethane	3410		500	461	1900		25	22.7	0.5
Propene	224		20	36.9	244		20	36.3	1.0
Dichlorodifluoromethane	1880		500	461	1080		20	18.2	0.5
Chloromethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Dichlorotetrafluoroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Vinyl Chloride	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Methanol	<SRL	U	20	184	<SRL	U	20	181	5.0
1,3-Butadiene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Bromomethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Chloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Dichlorofluoromethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Ethanol	<SRL	U	20	73.8	<SRL	U	20	72.6	2.0
Vinyl Bromide	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Acetone	<SRL	U	20	73.8	<SRL	U	20	72.6	2.0
Trichlorofluoromethane	8670		500	461	1200		20	18.2	0.5
2-Propanol (IPA)	<SRL	U	20	73.8	<SRL	U	20	72.6	2.0
Acrylonitrile	<SRL	U	20	36.9	<SRL	U	20	36.3	1.0
1,1-Dichloroethene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Methylene Chloride (DCM)	<SRL	U	20	36.9	<SRL	U	20	36.3	1.0
Allyl Chloride	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Carbon Disulfide	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Trichlorotrifluoroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
trans-1,2-Dichloroethene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,1-Dichloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Methyl Tert Butyl Ether (MTBE)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Vinyl Acetate	<SRL	U	20	36.9	<SRL	U	20	36.3	1.0
2-Butanone (MEK)	<SRL	U	20	36.9	<SRL	U	20	36.3	1.0
cis-1,2-Dichloroethene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Hexane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Chloroform	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Ethyl Acetate	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Tetrahydrofuran	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2-Dichloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,1,1-Trichloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5

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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171450
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/19/2017
DATE REPORTED : 09/25/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.1			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.2			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171450-103294				171450-103298				
Date Sampled	09/15/2017				09/15/2017				
Date Analyzed	09/21/2017				09/21/2017				
Can Dilution Factor	1.84				1.81				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Benzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Carbon Tetrachloride	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Cyclohexane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2-Dichloropropane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Bromodichloromethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,4-Dioxane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Trichloroethene (TCE)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
2,2,4-Trimethylpentane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Heptane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
cis-1,3-Dichloropropene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
4-Methyl-2-pentanone (MiBK)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
trans-1,3-Dichloropropene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,1,2-Trichloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Toluene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
2-Hexanone (MBK)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Dibromochloromethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2-Dibromoethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Tetrachloroethene (PCE)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Chlorobenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Ethylbenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
m & p-Xylenes	<SRL	U	20	36.9	<SRL	U	20	36.3	1.0
Bromoform	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Styrene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,1,2,2-Tetrachloroethane	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
o-Xylene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
4-Ethyltoluene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,3,5-Trimethylbenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2,4-Trimethylbenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,3-Dichlorobenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,4-Dichlorobenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2-Dichlorobenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
1,2,4-Trichlorobenzene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
Hexachlorobutadiene	<SRL	U	20	18.4	<SRL	U	20	18.2	0.5
BFB-Surrogate Std. % Recovery	101%				92%				70-130%

U - Compound was analyzed for, but was not detected at or above the SRL.

Marcus Hueppe
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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT	: CleanAir Engineering	DATE RECEIVED	: 09/19/2017
PROJECT NO	: 171450	DATE REPORTED	: 09/25/2017
MATRIX	: AIR		
UNITS	: PPB (v/v)		

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.1	
AAC ID	171450-103294	
Date Sampled	09/15/2017	
Date Analyzed	09/21/2017	
Can Dilution Factor	1.84	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	8400	43
1-Chloro-1-fluoroethene	54.3	97
Isobutane	578	53
Butane	630	86
2-Methylbutane	1560	83
Pentane	574	86
Cyclopentane	3710	90
BFB-Surrogate Std. % Recovery	101%	

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.2	
AAC ID	171450-103298	
Date Sampled	09/15/2017	
Date Analyzed	09/21/2017	
Can Dilution Factor	1.81	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	1410	74
1,1-Difluoroethane	20.0	90
1-Chloro-1-fluoroethene	21.0	91
Isobutane	280	59
2-Methyl-1-propene	30.9	90
Butane	455	80
2-Methylbutane	951	64
Pentane	403	86
Cyclopentane	924	86
BFB-Surrogate Std. % Recovery	92%	

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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171450
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/19/2017
DATE REPORTED : 09/25/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.3			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.4			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171450-103302				171450-103306				
Date Sampled	09/18/2017				09/18/2017				
Date Analyzed	09/21/2017				09/21/2017				
Can Dilution Factor	1.82				1.78				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Chlorodifluoromethane	4920		500	456	1840		25	22.3	0.5
Propene	546		20	36.4	289		20	35.6	1.0
Dichlorodifluoromethane	6100		500	456	1130		20	17.8	0.5
Chloromethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Dichlorotetrafluoroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Vinyl Chloride	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Methanol	<SRL	U	20	182	<SRL	U	20	178	5.0
1,3-Butadiene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Bromomethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Chloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Dichlorofluoromethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Ethanol	<SRL	U	20	72.9	<SRL	U	20	71.2	2.0
Vinyl Bromide	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Acetone	<SRL	U	20	72.9	<SRL	U	20	71.2	2.0
Trichlorofluoromethane	4220		500	456	189		20	17.8	0.5
2-Propanol (IPA)	<SRL	U	20	72.9	<SRL	U	20	71.2	2.0
Acrylonitrile	<SRL	U	20	36.4	<SRL	U	20	35.6	1.0
1,1-Dichloroethene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Methylene Chloride (DCM)	<SRL	U	20	36.4	<SRL	U	20	35.6	1.0
Allyl Chloride	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Carbon Disulfide	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Trichlorotrifluoroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
trans-1,2-Dichloroethene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,1-Dichloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Methyl Tert Butyl Ether (MTBE)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Vinyl Acetate	<SRL	U	20	36.4	<SRL	U	20	35.6	1.0
2-Butanone (MEK)	<SRL	U	20	36.4	<SRL	U	20	35.6	1.0
cis-1,2-Dichloroethene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Hexane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Chloroform	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Ethyl Acetate	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Tetrahydrofuran	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2-Dichloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,1,1-Trichloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5

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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171450
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/19/2017
DATE REPORTED : 09/25/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.3			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.4			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171450-103302				171450-103306				
Date Sampled	09/18/2017				09/18/2017				
Date Analyzed	09/21/2017				09/21/2017				
Can Dilution Factor	1.82				1.78				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Benzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Carbon Tetrachloride	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Cyclohexane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2-Dichloropropane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Bromodichloromethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,4-Dioxane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Trichloroethene (TCE)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
2,2,4-Trimethylpentane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Heptane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
cis-1,3-Dichloropropene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
4-Methyl-2-pentanone (MiBK)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
trans-1,3-Dichloropropene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,1,2-Trichloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Toluene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
2-Hexanone (MBK)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Dibromochloromethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2-Dibromoethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Tetrachloroethene (PCE)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Chlorobenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Ethylbenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
m & p-Xylenes	<SRL	U	20	36.4	<SRL	U	20	35.6	1.0
Bromoform	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Styrene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,1,2,2-Tetrachloroethane	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
o-Xylene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
4-Ethyltoluene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,3,5-Trimethylbenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2,4-Trimethylbenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,3-Dichlorobenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,4-Dichlorobenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2-Dichlorobenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
1,2,4-Trichlorobenzene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
Hexachlorobutadiene	<SRL	U	20	18.2	<SRL	U	20	17.8	0.5
BFB-Surrogate Std. % Recovery	100%				94%				70-130%

U - Compound was analyzed for, but was not detected at or above the SRL.

Marcus Hueppe
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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT	: CleanAir Engineering	DATE RECEIVED	: 09/19/2017
PROJECT NO	: 171450	DATE REPORTED	: 09/25/2017
MATRIX	: AIR		
UNITS	: PPB (v/v)		

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.3	
AAC ID	171450-103302	
Date Sampled	09/18/2017	
Date Analyzed	09/21/2017	
Can Dilution Factor	1.82	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	10100	83
1-Chloro-1-fluoroethene	92.3	97
Isobutane	810	45
Butane	1040	72
2-Methylbutane	395	78
Pentane	78.3	86
Cyclopentane	408	86
BFB-Surrogate Std. % Recovery	100%	

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.4	
AAC ID	171450-103306	
Date Sampled	09/18/2017	
Date Analyzed	09/21/2017	
Can Dilution Factor	1.78	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	2570	40
1-Chloro-1-fluoroethene	39.2	94
Isobutane	386	50
Butane	758	72
BFB-Surrogate Std. % Recovery	94%	

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TO-15 QC REPORT

Atmospheric Analysis & Consulting, Inc.

ANALYSIS DATE : 09/21/2017
ANALYST : JJG

INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : PS082817-02

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 08/29/2017 Calibration

Compounds	Conc	Daily Conc	%REC*
4-BFB (surrogate standard)	10.00	10.47	105
Chlorodifluoromethane	10.40	11.15	107
Propene	10.90	11.60	106
Dichlorodifluoromethane	10.60	10.43	98
Chloromethane	10.30	10.44	101
Dichlorotetrafluoroethane	10.00	10.80	108
Vinyl Chloride	10.10	9.92	98
Methanol	19.00	18.28	96
1,3-Butadiene	10.50	10.27	98
Bromomethane	10.00	11.39	114
Chloroethane	9.70	9.24	95
Dichlorofluoromethane	10.60	11.14	105
Ethanol	9.10	8.47	93
Vinyl Bromide	10.10	10.78	107
Acetone	10.60	11.10	105
Trichlorofluoromethane	10.40	10.50	101
2-Propanol (IPA)	10.80	10.74	99
Acrylonitrile	11.50	11.14	97
1,1-Dichloroethene	10.80	12.50	116
Methylene Chloride (DCM)	10.50	11.15	106
Allyl Chloride	11.00	10.44	95
Carbon Disulfide	10.00	10.23	102
Trichlorotrifluoroethane	10.70	11.00	103
trans-1,2-Dichloroethene	10.10	11.07	110
1,1-Dichloroethane	10.50	10.93	104
Methyl Tert Butyl Ether (MTBE)	10.60	10.81	102
Vinyl Acetate	10.80	11.07	103
2-Butanone (MEK)	10.60	10.41	98
cis-1,2-Dichloroethene	10.60	10.01	94
Hexane	10.50	10.13	96
Chloroform	10.90	10.97	101
Ethyl Acetate	10.90	10.84	99
Tetrahydrofuran	10.50	9.84	94
1,2-Dichloroethane	10.60	10.84	102
1,1,1-Trichloroethane	10.60	11.05	104

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Atmospheric Analysis & Consulting, Inc.

ANALYSIS DATE : 09/21/2017
ANALYST : JJG

INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : PS082817-02

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 08/29/2017 Calibration

Compounds	Conc	Daily Conc	%REC*
Benzene	10.40	11.32	109
Carbon Tetrachloride	10.80	10.99	102
Cyclohexane	10.50	10.65	101
1,2-Dichloropropane	10.50	10.25	98
Bromodichloromethane	10.40	10.99	106
1,4-Dioxane	10.40	9.71	93
Trichloroethene (TCE)	10.40	10.90	105
2,2,4-Trimethylpentane	10.30	9.89	96
Heptane	10.40	11.27	108
cis-1,3-Dichloropropene	10.70	11.45	107
4-Methyl-2-pentanone (MiBK)	10.00	9.63	96
trans-1,3-Dichloropropene	10.00	9.92	99
1,1,2-Trichloroethane	10.40	11.41	110
Toluene	10.60	10.71	101
2-Hexanone (MBK)	10.80	10.56	98
Dibromochloromethane	9.90	10.24	103
1,2-Dibromoethane	10.40	10.30	99
Tetrachloroethene (PCE)	10.30	11.41	111
Chlorobenzene	10.50	10.72	102
Ethylbenzene	10.50	11.45	109
m & p-Xylenes	20.00	21.98	110
Bromoform	10.40	11.24	108
Styrene	10.30	11.09	108
1,1,2,2-Tetrachloroethane	10.40	11.64	112
o-Xylene	10.40	11.42	110
4-Ethyltoluene	10.00	10.71	107
1,3,5-Trimethylbenzene	10.00	10.69	107
1,2,4-Trimethylbenzene	9.90	10.66	108
Benzyl Chloride (a-Chlorotoluene)	9.60	10.36	108
1,3-Dichlorobenzene	9.60	10.28	107
1,4-Dichlorobenzene	9.80	10.30	105
1,2-Dichlorobenzene	9.70	10.04	104
1,2,4-Trichlorobenzene	8.80	9.10	103
Hexachlorobutadiene	9.30	9.01	97

* - %REC should be 70-130%

Marcus Hueppe
Laboratory Director

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

CLIENT ID	: **Laboratory Control Spike**	**DATE ANALYZED**	: **09/21/2017**
AAC ID	: **LCS/LCSD**	**DATE REPORTED**	: **09/21/2017**
MEDIA	: **Air**	**UNITS**	: **ppbv**

TO-15 Laboratory Control Spike Recovery

Compound	Sample Conc.	Spike Added	Spike Res	Dup Spike Res	Spike % Rec *	Spike Dup % Rec *	RPD** %
1,1-Dichloroethene	0.0	10.80	12.50	13.45	116	125	7.3
Methylene Chloride (DCM)	0.0	10.50	11.15	13.00	106	124	15.3
Benzene	0.0	10.40	11.32	10.93	109	105	3.5
Trichloroethene (TCE)	0.0	10.40	10.90	10.02	105	96	8.4
Toluene	0.0	10.60	10.71	11.66	101	110	8.5
Tetrachloroethene (PCE)	0.0	10.30	11.41	10.77	111	105	5.8
Chlorobenzene	0.0	10.50	10.72	11.35	102	108	5.7
Ethylbenzene	0.0	10.50	11.45	11.96	109	114	4.4
m & p-Xylenes	0.0	20.00	21.98	22.22	110	111	1.1
o-Xylene	0.0	10.40	11.42	10.89	110	105	4.8

* Must be 70-130%

** Must be < 25%

Marcus Hueppe
Laboratory Director

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Atmospheric Analysis & Consulting, Inc.

Method Blank Analysis Report

MATRIX	: AIR	ANALYSIS DATE	: 09/21/2017
UNITS	: ppbv	REPORT DATE	: 09/21/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / AAC ID	Method Blank MB 092117	RL
Chlorodifluoromethane	<RL	0.5
Propene	<RL	1.0
Dichlorodifluoromethane	<RL	0.5
Chloromethane	<RL	0.5
Dichlorotetrafluoroethane	<RL	0.5
Vinyl Chloride	<RL	0.5
Methanol	<RL	5.0
1,3-Butadiene	<RL	0.5
Bromomethane	<RL	0.5
Chloroethane	<RL	0.5
Dichlorofluoromethane	<RL	0.5
Ethanol	<RL	2.0
Vinyl Bromide	<RL	0.5
Acetone	<RL	2.0
Trichlorofluoromethane	<RL	0.5
2-Propanol (IPA)	<RL	2.0
Acrylonitrile	<RL	1.0
1,1-Dichloroethene	<RL	0.5
Methylene Chloride (DCM)	<RL	1.0
Allyl Chloride	<RL	0.5
Carbon Disulfide	<RL	0.5
Trichlorotrifluoroethane	<RL	0.5
trans-1,2-Dichloroethene	<RL	0.5
1,1-Dichloroethane	<RL	0.5
Methyl Tert Butyl Ether (MTBE)	<RL	0.5
Vinyl Acetate	<RL	1.0
2-Butanone (MEK)	<RL	1.0
cis-1,2-Dichloroethene	<RL	0.5
Hexane	<RL	0.5
Chloroform	<RL	0.5
Ethyl Acetate	<RL	0.5
Tetrahydrofuran	<RL	0.5
1,2-Dichloroethane	<RL	0.5
1,1,1-Trichloroethane	<RL	0.5
Benzene	<RL	0.5
Carbon Tetrachloride	<RL	0.5
Cyclohexane	<RL	0.5
1,2-Dichloropropane	<RL	0.5
Bromodichloromethane	<RL	0.5
1,4-Dioxane	<RL	0.5
Trichloroethene (TCE)	<RL	0.5
2,2,4-Trimethylpentane	<RL	0.5
Heptane	<RL	0.5

1534 Eastman Ave., Ste. A • Ventura, • CA 93003 www.aaclab.com • (805) 650-1642 • FAX (805) 650-1644

Atmospheric Analysis & Consulting, Inc.

Method Blank Analysis Report

MATRIX	**: AIR**	**ANALYSIS DATE**	**: 09/21/2017**
UNITS	**: ppbv**	**REPORT DATE**	**: 09/21/2017**

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / *AAC ID*	Method Blank / MB 092117	RL
cis-1,3-Dichloropropene	<RL	0.5
4-Methyl-2-pentanone (MiBK)	<RL	0.5
trans-1,3-Dichloropropene	<RL	0.5
1,1,2-Trichloroethane	<RL	0.5
Toluene	<RL	0.5
2-Hexanone (MBK)	<RL	0.5
Dibromochloromethane	<RL	0.5
1,2-Dibromoethane	<RL	0.5
Tetrachloroethene (PCE)	<RL	0.5
Chlorobenzene	<RL	0.5
Ethylbenzene	<RL	0.5
m & p-Xylenes	<RL	1.0
Bromoform	<RL	0.5
Styrene	<RL	0.5
1,1,2,2-Tetrachloroethane	<RL	0.5
o-Xylene	<RL	0.5
4-Ethyltoluene	<RL	0.5
1,3,5-Trimethylbenzene	<RL	0.5
1,2,4-Trimethylbenzene	<RL	0.5
Benzyl Chloride (a-Chlorotoluene)	<RL	0.5
1,3-Dichlorobenzene	<RL	0.5
1,4-Dichlorobenzene	<RL	0.5
1,2-Dichlorobenzene	<RL	0.5
1,2,4-Trichlorobenzene	<RL	0.5
Hexachlorobutadiene	<RL	0.5
System Monitoring Compounds		
BFB-Surrogate Std. % Recovery	104%	--

RL - Reporting Limit

Marcus Hueppe
Laboratory Director

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

AAC ID	: 171435-103225	DATE ANALYZED	: 09/21/2017
MATRIX	: Air	DATE REPORTED	: 09/21/2017
		UNITS	: ppbv

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Chlorodifluoromethane	<SRL	<SRL	0.0
Propene	<SRL	<SRL	0.0
Dichlorodifluoromethane	<SRL	<SRL	0.0
Chloromethane	<SRL	<SRL	0.0
Dichlorotetrafluoroethane	<SRL	<SRL	0.0
Vinyl Chloride	<SRL	<SRL	0.0
Methanol	12.6	12.8	1.6
1,3-Butadiene	<SRL	<SRL	0.0
Bromomethane	<SRL	<SRL	0.0
Chloroethane	<SRL	<SRL	0.0
Dichlorofluoromethane	<SRL	<SRL	0.0
Ethanol	8.94	8.92	0.2
Vinyl Bromide	<SRL	<SRL	0.0
Acetone	12.4	11.7	5.8
Trichlorofluoromethane	<SRL	<SRL	0.0
2-Propanol (IPA)	5.25	4.92	6.5
Acrylonitrile	<SRL	<SRL	0.0
1,1-Dichloroethene	<SRL	<SRL	0.0
Methylene Chloride (DCM)	<SRL	<SRL	0.0
Allyl Chloride	<SRL	<SRL	0.0
Carbon Disulfide	<SRL	<SRL	0.0
Trichlorotrifluoroethane	<SRL	<SRL	0.0
trans-1,2-Dichloroethene	<SRL	<SRL	0.0
1,1-Dichloroethane	<SRL	<SRL	0.0
Methyl Tert Butyl Ether (MTBE)	<SRL	<SRL	0.0
Vinyl Acetate	<SRL	<SRL	0.0
2-Butanone (MEK)	<SRL	<SRL	0.0
cis-1,2-Dichloroethene	<SRL	<SRL	0.0
Hexane	<SRL	<SRL	0.0
Chloroform	<SRL	<SRL	0.0
Ethyl Acetate	<SRL	<SRL	0.0
Tetrahydrofuran	<SRL	<SRL	0.0
1,2-Dichloroethane	<SRL	<SRL	0.0
1,1,1-Trichloroethane	<SRL	<SRL	0.0
Benzene	<SRL	<SRL	0.0
Carbon Tetrachloride	<SRL	<SRL	0.0

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

AAC ID	**: 171435-103225**	**DATE ANALYZED**	**: 09/21/2017**
MATRIX	**: Air**	**DATE REPORTED**	**: 09/21/2017**
		UNITS	**: ppbv**

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Cyclohexane	<SRL	<SRL	0.0
1,2-Dichloropropane	<SRL	<SRL	0.0
Bromodichloromethane	<SRL	<SRL	0.0
1,4-Dioxane	<SRL	<SRL	0.0
Trichloroethene (TCE)	<SRL	<SRL	0.0
2,2,4-Trimethylpentane	<SRL	<SRL	0.0
Heptane	<SRL	<SRL	0.0
cis-1,3-Dichloropropene	<SRL	<SRL	0.0
4-Methyl-2-pentanone (MiBK)	<SRL	<SRL	0.0
trans-1,3-Dichloropropene	<SRL	<SRL	0.0
1,1,2-Trichloroethane	<SRL	<SRL	0.0
Toluene	2.71	2.71	0.0
2-Hexanone (MBK)	<SRL	<SRL	0.0
Dibromochloromethane	<SRL	<SRL	0.0
1,2-Dibromoethane	<SRL	<SRL	0.0
Tetrachloroethene (PCE)	<SRL	<SRL	0.0
Chlorobenzene	<SRL	<SRL	0.0
Ethylbenzene	<SRL	<SRL	0.0
m & p-Xylenes	<SRL	<SRL	0.0
Bromoform	<SRL	<SRL	0.0
Styrene	<SRL	<SRL	0.0
1,1,2,2-Tetrachloroethane	<SRL	<SRL	0.0
o-Xylene	<SRL	<SRL	0.0
4-Ethyltoluene	<SRL	<SRL	0.0
1,3,5-Trimethylbenzene	<SRL	<SRL	0.0
1,2,4-Trimethylbenzene	<SRL	<SRL	0.0
Benzyl Chloride (a-Chlorotoluene)	<SRL	<SRL	0.0
1,3-Dichlorobenzene	<SRL	<SRL	0.0
1,4-Dichlorobenzene	<SRL	<SRL	0.0
1,2-Dichlorobenzene	<SRL	<SRL	0.0
1,2,4-Trichlorobenzene	<SRL	<SRL	0.0
Hexachlorobutadiene	<SRL	<SRL	0.0
System Monitoring Compounds			
BFB-Surrogate Std. % Recovery	104%	98%	5.7

SRL - Sample Reporting Limit

Marcus Hueppe
Laboratory Director

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TO-15 RAW DATA

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211711.D Vial: 6
Acq On : 21 Sep 2017 16:32 Operator: JJG
Sample : 171450-103294 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.36	130	296745m	10.00 ppbv	0.01
36) 1,4-Difluorobenzene	17.69	114	1015722	10.00 ppbv	0.00
55) Chlorobenzene-d5	23.54	117	811038	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	539556	10.09 ppbv	0.00
Spiked Amount 10.000			Recovery	= 100.90%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.22	51	3703615	1546.15 ppbv	
3) Propene	3.25	41	95680m	121.54 ppbv	
4) Dichlorodifluoromethane	3.35	85	2816336	944.83 ppbv	
5) Chloromethane	3.58	52	1231	N.D.	
6) Dichlorotetrafluoroethane	3.77	135	329	N.D.	
7) VinylChloride	3.92	62	537	N.D.	
8) Methanol	3.92	31	100	N.D.	
9) 1,3-Butadiene	4.15	54	4330	N.D.	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.81	64	94	N.D.	
12) Dichlorofluoromethane	5.08	67	10395	N.D.	
13) Ethanol	0.00	31	0	N.D.	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	6.21	43	2641	N.D.	
16) Trichlorofluoromethane	6.22	103	4895981	3176.09 ppbv	
17) 2-Propanol(IPA)	6.76	45	120	N.D.	
18) Acrylonitrile	7.00	52	1731	N.D.	
19) 1,1-Dichloroethene	7.51	96	860	N.D.	
20) MethyleneChloride(DCM)	7.86	84	2512	N.D.	
21) AllylChloride	8.17	39	344	N.D.	
22) CarbonDisulfide	8.20	76	17208	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	0.00	63	0	N.D. d	
26) MethylTertButylEther(MTBE)	11.23	73	91	N.D.	
27) VinylAcetate	11.55	43	98	N.D.	
28) 2-Butanone(MEK)	12.09	43	241	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.68	41	438	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	13.95	43	100	N.D.	

Page 22

(#) = qualifier out of range (m) = manual integration
09211711.D 082917.M Thu Sep 21 17:37:56 2017

9/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211711.D Vial: 6
Acq On : 21 Sep 2017 16:32 Operator: JJG
Sample : 171450-103294 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.76	42	95	N.D.	
34) 1,2-Dichloroethane	0.00	62	0	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.85	78	538	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	0.00	84	0	N.D.	
40) 1,2-Dichloropropane	18.24	63	289	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45) Heptane	0.00	71	0	N.D.	
46) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.36	91	1738	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	23.54	114	119	N.D.	
57) Ethylbenzene	24.05	91	350	N.D.	
58) m&p-Xylene	24.26	106	582	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	0.00	104	0	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	24.84	91	266	N.D.	
64) 4-Ethyltoluene	0.00	105	0	N.D.	
65) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
66) 1,2,4-Trimethylbenzene	27.01	105	420	N.D.	
67) BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
69) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	105	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	296	N.D.	
72) Hexachlorobutadiene	31.08	225	414	N.D.	

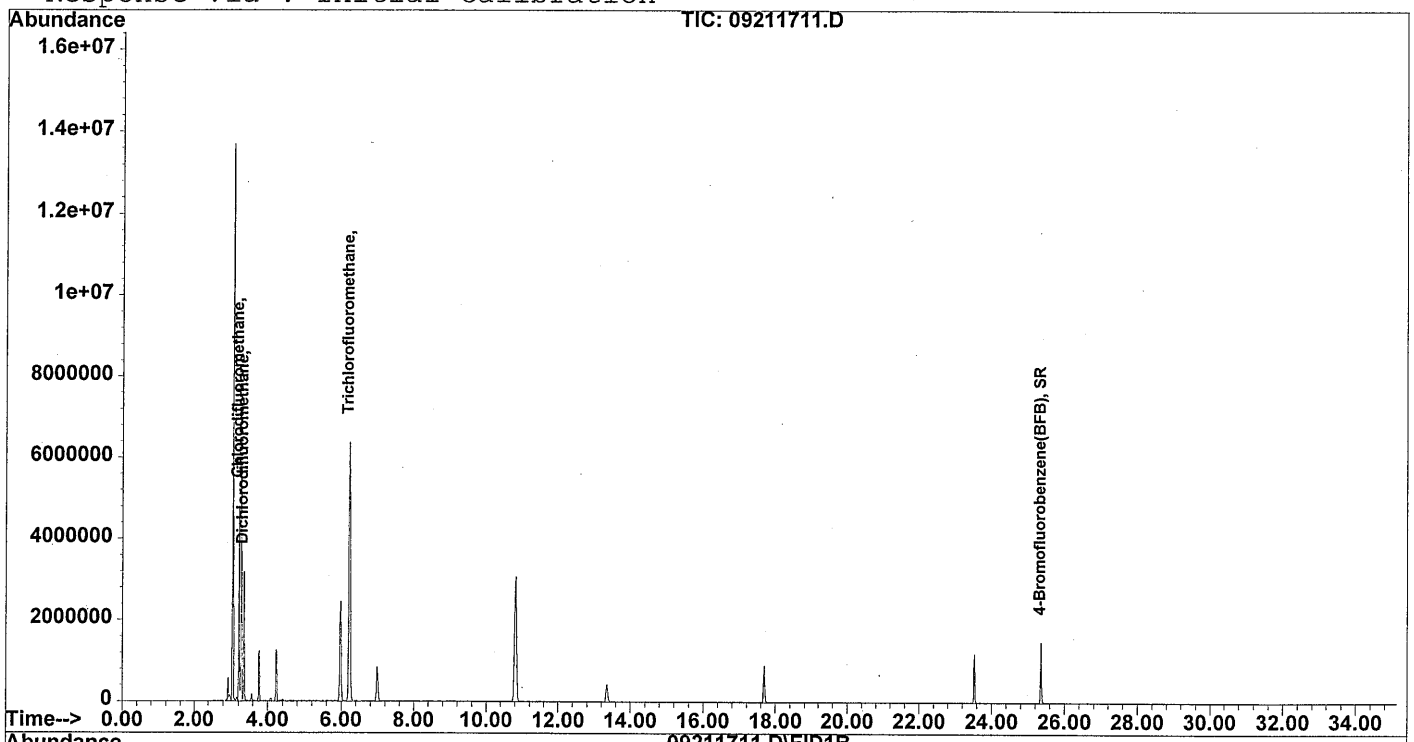
(#) = qualifier out of range (m) = manual integration
09211711.D 082917.M Thu Sep 21 17:37:57 2017

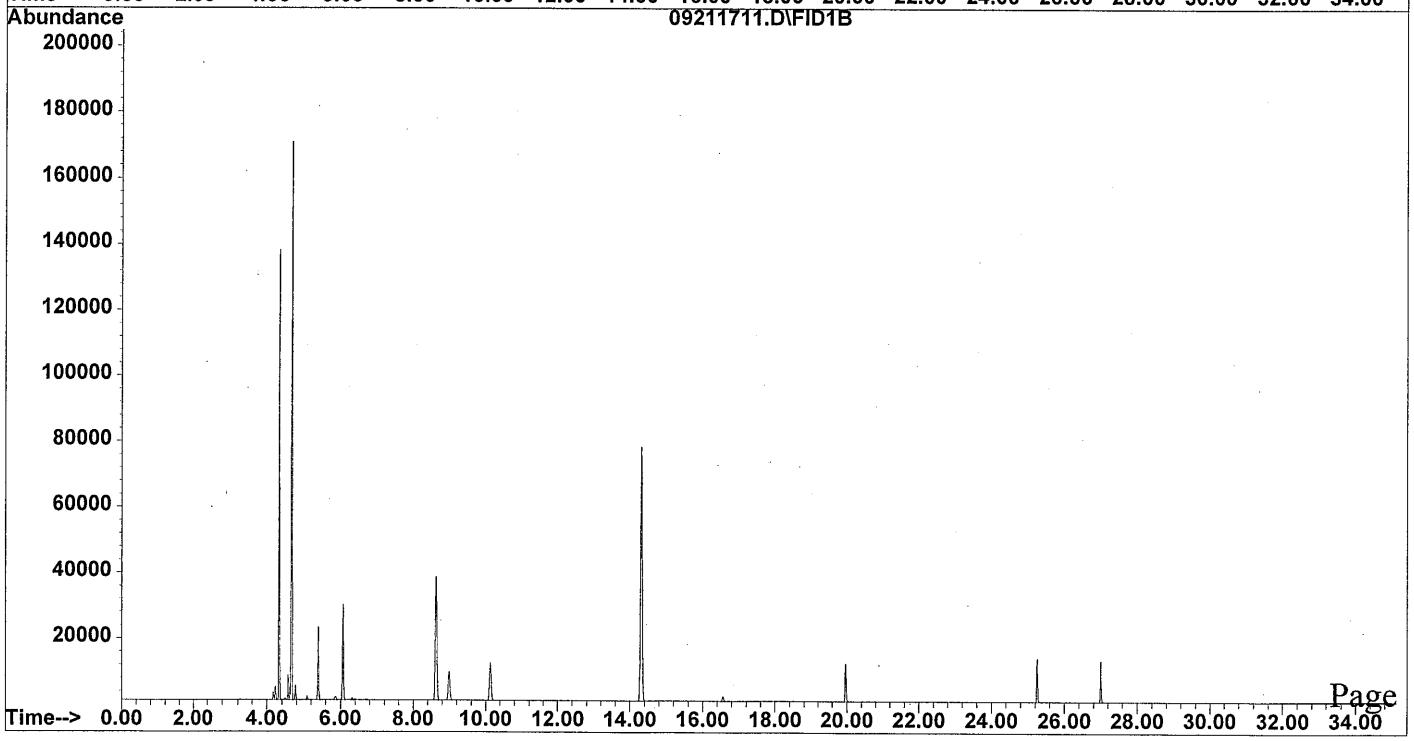
9/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211711.D Vial: 6
Acq On : 21 Sep 2017 16:32 Operator: JJG
Sample : 171450-103294 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:37 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211722.D Vial: 3
Acq On : 22 Sep 2017 00:47 Operator: JJG
Sample : 171450-103294 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:35 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.36	130	283227m	10.00 ppbv	0.02
36) 1,4-Difluorobenzene	17.69	114	896476	10.00 ppbv	0.00
55) Chlorobenzene-d5	23.54	117	723511	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	489361	10.25 ppbv	0.00
Spiked Amount 10.000			Recovery	= 102.50%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	168940	1847.34 ppbv	
3) Propene	3.25	41	4738	N.D.	
4) Dichlorodifluoromethane	3.35	85	116102	1020.23 ppbv #	
5) Chloromethane	3.65	52	96	N.D.	
6) Dichlorotetrafluoroethane	0.00	135	0	N.D.	
7) VinylChloride	0.00	62	0	N.D.	
8) Methanol	0.00	31	0	N.D. d	
9) 1,3-Butadiene	4.12	54	127	N.D.	
10) Bromomethane	4.68	96	94	N.D.	
11) Chloroethane	4.93	64	350	N.D.	
12) Dichlorofluoromethane	5.07	67	798	N.D.	
13) Ethanol	0.00	31	0	N.D. d	
14) VinylBromide	5.35	108	102	N.D.	
15) Acetone	0.00	43	0	N.D. d	
16) Trichlorofluoromethane	6.22	103	276670	4701.14 ppbv	
17) 2-Propanol(IPA)	6.66	45	514	N.D.	
18) Acrylonitrile	6.90	52	331	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.84	84	4665	N.D.	
21) AllylChloride	8.08	39	883	N.D.	
22) CarbonDisulfide	8.20	76	3736	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.78	63	1742	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.57	43	123	N.D.	
28) 2-Butanone(MEK)	12.13	43	239	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.67	41	1407	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	13.97	43	322	N.D.	

Page 25

(#) = qualifier out of range (m) = manual integration
09211722.D 082917.M Fri Sep 22 10:36:17 2017

Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211722.D Vial: 3
Acq On : 22 Sep 2017 00:47 Operator: JJG
Sample : 171450-103294 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:35 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

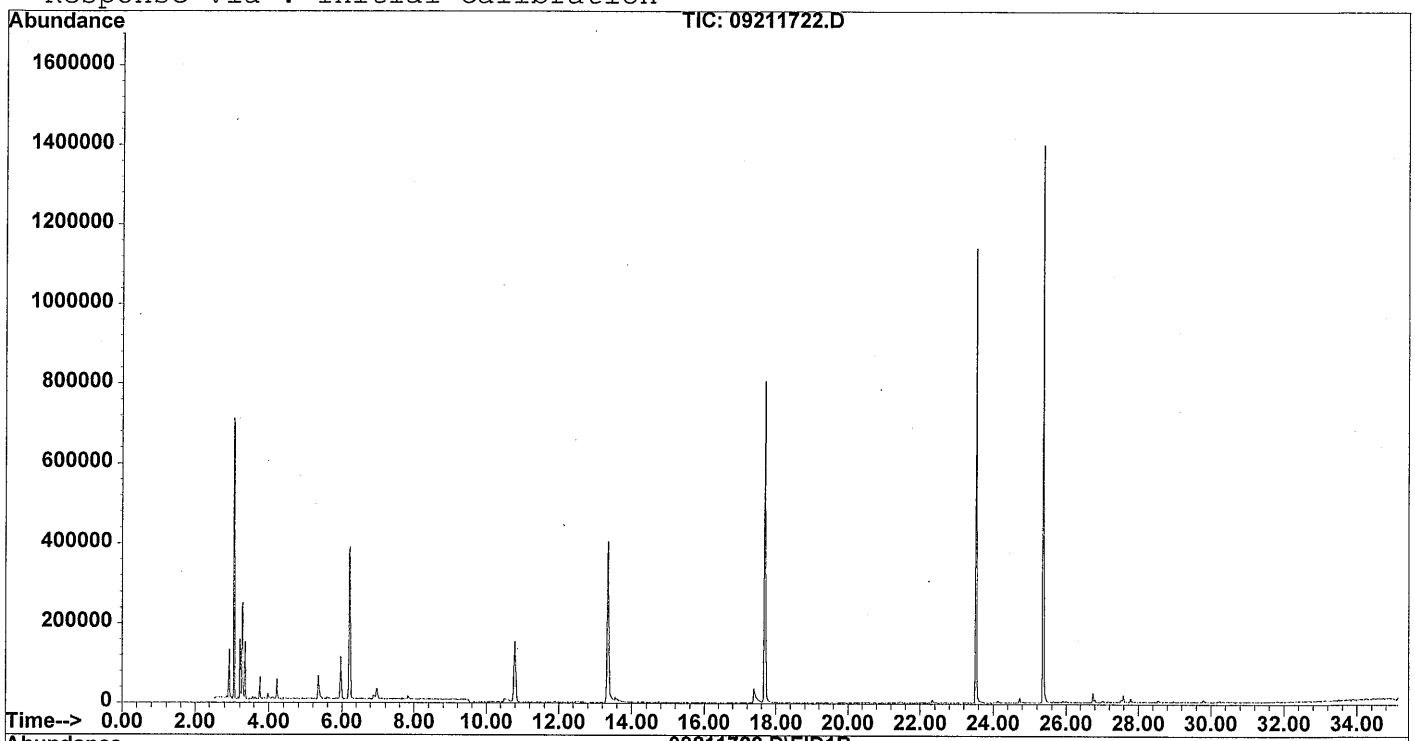
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33)	Tetrahydrofuran	14.81	42	202	N.D.	
34)	1,2-Dichloroethane	0.00	62	0	N.D.	
35)	1,1,1-Trichloroethane	0.00	97	0	N.D.	
37)	Benzene	16.85	78	348	N.D.	
38)	CarbonTetrachloride	0.00	117	0	N.D.	
39)	Cyclohexane	0.00	84	0	N.D.	
40)	1,2-Dichloropropane	18.37	63	98	N.D.	
41)	Bromodichloromethane	0.00	85	0	N.D.	
42)	1,4-Dioxane	0.00	88	0	N.D.	
43)	Trichloroethene(TCE)	0.00	130	0	N.D.	
44)	2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45)	Heptane	0.00	71	0	N.D.	
46)	cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47)	4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48)	trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49)	1,1,2-Trichloroethane	0.00	97	0	N.D.	
50)	Toluene	21.36	91	1894	N.D.	
51)	2-Hexanone(MBK)	0.00	58	0	N.D.	
52)	Dibromochloromethane	0.00	129	0	N.D.	
53)	1,2-Dibromoethane	0.00	107	0	N.D.	
54)	Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56)	Chlorobenzene	23.55	114	100	N.D.	
57)	Ethylbenzene	24.07	91	1294	N.D.	
58)	m&p-Xylene	24.28	106	830	N.D.	
59)	Bromoform	0.00	173	0	N.D.	
60)	Styrene	24.74	104	139	N.D.	
61)	1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62)	o-Xylene	24.84	91	895	N.D.	
64)	4-Ethyltoluene	26.36	105	587	N.D.	
65)	1,3,5-Trimethylbenzene	26.47	105	505	N.D.	
66)	1,2,4-Trimethylbenzene	27.01	105	996	N.D.	
67)	BenzylChloride(a-Chlorotol	27.10	91	91	N.D.	
68)	1,3-Dichlorobenzene	27.29	146	115	N.D.	
69)	1,4-Dichlorobenzene	27.29	146	115	N.D.	
70)	1,2-Dichlorobenzene	0.00	146	0	N.D.	
71)	1,2,4-Trichlorobenzene	30.31	180	130	N.D.	
72)	Hexachlorobutadiene	0.00	225	0	N.D.	

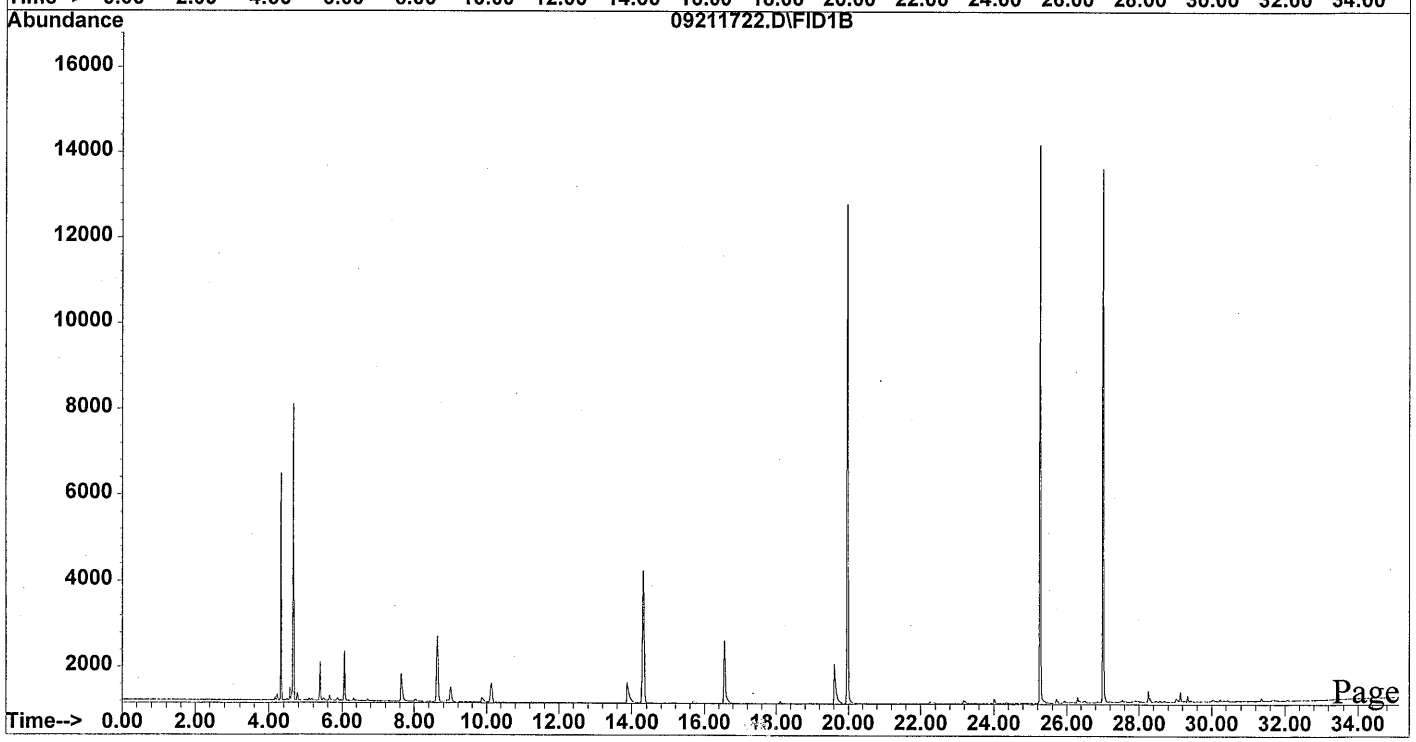
(#) = qualifier out of range (m) = manual integration
09211722.D 082917.M Fri Sep 22 10:36:17 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211722.D Vial: 3
Acq On : 22 Sep 2017 00:47 Operator: JJG
Sample : 171450-103294 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:35 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





09211722.D 082917.M Fri Sep 22 10:36:18 2017 Page 3

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211711.D Vial: 6
Acq On : 21 Sep 2017 4:32 pm Operator: JJG
Sample : 171450-103294 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****

Peak Number 1 Norflurane Concentration Rank 1

Dil/4 from x500

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.05	2531.09 ppbv	18757100	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	78
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
5	1H-Imidazol-2-amine, sulfate (2:1)	83	C3H5N3	001450-93-7	4

****

Peak Number 2 Ethene, 1-chloro-1-fluoro- Concentration Rank 8

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.58	29.43 ppbv	218123	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	97
2	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	91
3	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	91
4	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	87
5	2-Hexen-4-yne, (Z)-	80	C6H8	030626-48-3	9

****

Peak Number 3 Isobutane Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.79	313.65 ppbv	2324370	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	53
2	Isobutane	58	C4H10	000075-28-5	53
3	Isobutane	58	C4H10	000075-28-5	42
4	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9
5	Propane, 1-chloro-2-methyl-	92	C4H9Cl	000513-36-0	4

Page 28

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Peak Number 4 Butane Concentration Rank 4

R.T.	EstConc	Area	Relative to ISTD	R.T.

BA 09/25/17

4.22	341.73 ppbv	2532470	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	86
2	Butane	58	C4H10	000106-97-8	78
3	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
4	Isobutane	58	C4H10	000075-28-5	9
5	Hydrogen azide	43	HN3	007782-79-8	5

****

Peak Number 5 Butane, 2-methyl- Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.98	843.65 ppbv	6251980	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	83
2	Butane, 2-methyl-	72	C5H12	000078-78-4	72
3	Butane, 2-methyl-	72	C5H12	000078-78-4	43
4	1-Propene, 2-methyl-	56	C4H8	000115-11-7	9
5	Methane, isocyanato-	57	C2H3NO	000624-83-9	9

****

Peak Number 6 Pentane Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
6.99	311.49 ppbv	2308360	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Pentane	72	C5H12	000109-66-0	86
2	Pentane	72	C5H12	000109-66-0	86
3	Pentane	72	C5H12	000109-66-0	72
4	Butane, 2-methyl-	72	C5H12	000078-78-4	50
5	Butane, 2-methyl-	72	C5H12	000078-78-4	38

****

Peak Number 7 Cyclopentane Concentration Rank 2

Dilution X500

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.83	1682.12 ppbv	12465600	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	90
2	Cyclobutanone	70	C4H6O	001191-95-3	56
3	Cyclopropane, ethyl-	70	C5H10	001191-96-4	56
4	1-Pentene	70	C5H10	000109-67-1	49
5	1-Pentene	70	C5H10	000109-67-1	47

09211711.D 082917.M Mon Sep 25 13:25:27 2017

BA 09/25/17

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211722.D Vial: 3
Acq On : 22 Sep 2017 12:47 am Operator: JJG
Sample : 171450-103294 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.04	4552.18 ppbv	1283820	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	43
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
5	1H-Imidazol-2-amine, sulfate (2:1)	83	C3H5N3	001450-93-7	4

****
Peak Number 2 Cyclopentane Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.80	2013.76 ppbv	567926	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	90
2	Cyclobutane, methyl-	70	C5H10	000598-61-8	78
3	1-Pentene	70	C5H10	000109-67-1	72
4	Cyclopropane, ethyl-	70	C5H10	001191-96-4	56
5	1-Pentene	70	C5H10	000109-67-1	50

09211722.D 082917.M Mon Sep 25 21:19:04 2017

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211713.D Vial: 8
Acq On : 21 Sep 2017 18:02 Operator: JJG
Sample : 171450-103298 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 19:12 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.33	130	304232m	10.00 ppbv	-0.01
36) 1,4-Difluorobenzene	17.68	114	974146	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.54	117	827695	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	499833	9.16 ppbv	0.00
Spiked Amount 10.000			Recovery	= 91.60%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	2528082	1029.43 ppbv	#
3) Propene	3.23	41	108302m	134.19 ppbv	
4) Dichlorodifluoromethane	3.34	85	1814766	593.84 ppbv	
5) Chloromethane	3.56	52	603	N.D.	
6) Dichlorotetrafluoroethane	3.76	135	233	N.D.	
7) VinylChloride	3.92	62	530	N.D.	
8) Methanol	3.97	31	1641	N.D.	
9) 1,3-Butadiene	4.13	54	2410	N.D.	
10) Bromomethane	4.53	96	103	N.D.	
11) Chloroethane	4.84	64	97	N.D.	
12) Dichlorofluoromethane	5.05	67	2068	N.D.	
13) Ethanol	5.28	31	97	N.D.	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	6.21	43	9681	N.D.	
16) Trichlorofluoromethane	6.19	103	1047173	662.60 ppbv	
17) 2-Propanol(IPA)	6.70	45	486	N.D.	
18) Acrylonitrile	6.97	52	2253	N.D.	
19) 1,1-Dichloroethene	7.48	96	696	N.D.	
20) MethyleneChloride(DCM)	7.83	84	3120	N.D.	
21) AllylChloride	8.10	39	340	N.D.	
22) CarbonDisulfide	8.17	76	3577	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.78	63	10308	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.51	43	106	N.D.	
28) 2-Butanone(MEK)	12.13	43	110	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.62	41	563	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	14.04	43	94	N.D.	

Page 31

(#) = qualifier out of range (m) = manual integration
09211713.D 082917.M Thu Sep 21 19:12:31 2017

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211713.D Vial: 8
Acq On : 21 Sep 2017 18:02 Operator: JJG
Sample : 171450-103298 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 19:12 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.69	42	98	N.D.	
34) 1,2-Dichloroethane	0.00	62	0	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.79	78	310	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	17.31	84	113	N.D.	
40) 1,2-Dichloropropane	18.34	63	106	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	18.79	88	99	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	18.77	57	136	N.D.	
45) Heptane	0.00	71	0	N.D.	
46) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.36	91	360	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	23.54	114	122	N.D.	
57) Ethylbenzene	0.00	91	0	N.D.	
58) m&p-Xylene	24.26	106	184	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	24.69	104	936	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	0.00	91	0	N.D.	
64) 4-Ethyltoluene	0.00	105	0	N.D.	
65) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
66) 1,2,4-Trimethylbenzene	27.01	105	90	N.D.	
67) BenzylChloride(a-Chlorotol	27.28	91	110	N.D.	
68) 1,3-Dichlorobenzene	27.28	146	91	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	91	N.D.	
70) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	90	N.D.	
72) Hexachlorobutadiene	31.08	225	147	N.D.	

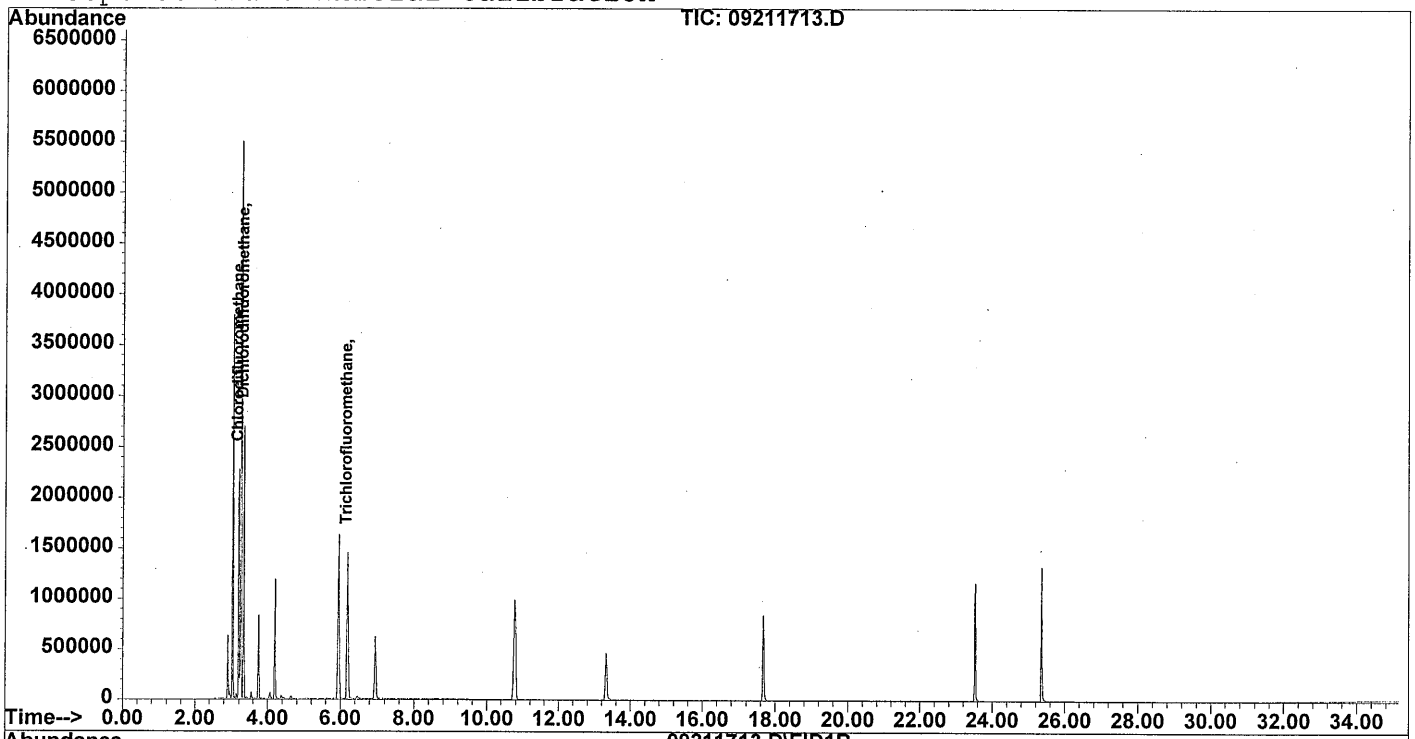
(#) = qualifier out of range (m) = manual integration
09211713.D 082917.M Thu Sep 21 19:12:33 2017

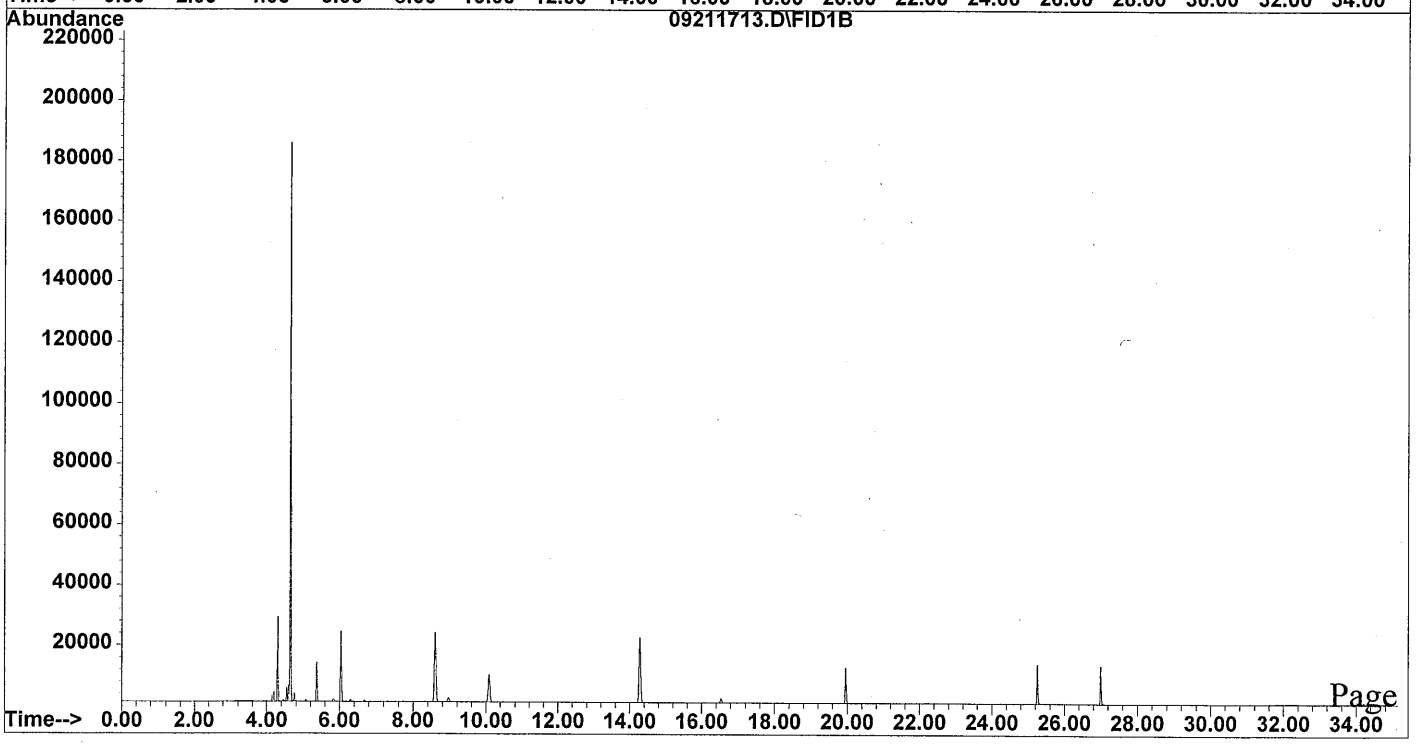
9/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211713.D Vial: 8
Acq On : 21 Sep 2017 18:02 Operator: JJG
Sample : 171450-103298 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 19:12 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





9/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211725.D Vial: 8
Acq On : 22 Sep 2017 3:00 Operator: JJG
Sample : 171450-103298 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:38 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.31	130	289178	10.00 ppbv	-0.03
36) 1,4-Difluorobenzene	17.68	114	904190	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.54	117	801229	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	464156	8.78 ppbv	0.00
Spiked Amount 10.000			Recovery =	87.80%	

Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	1952735	1045.68 ppbv	
3) Propene	3.23	41	91778m	149.55 ppbv	
4) Dichlorodifluoromethane	3.35	85	1372663	590.69 ppbv	
5) Chloromethane	3.57	52	804	N.D.	
6) Dichlorotetrafluoroethane	3.75	135	347	N.D.	
7) VinylChloride	3.90	62	351	N.D.	
8) Methanol	3.98	31	1995	N.D.	
9) 1,3-Butadiene	4.13	54	1604	N.D.	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.76	64	294	N.D.	
12) Dichlorofluoromethane	5.06	67	1342	N.D.	
13) Ethanol	5.37	31	7928	N.D.	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	0.00	43	0	N.D. d	
16) Trichlorofluoromethane	6.20	103	763084	634.97 ppbv	
17) 2-Propanol(IPA)	6.68	45	467	N.D.	
18) Acrylonitrile	6.80	52	112	N.D.	
19) 1,1-Dichloroethene	7.46	96	533	N.D.	
20) MethyleneChloride(DCM)	7.82	84	2686	N.D.	
21) AllylChloride	8.08	39	453	N.D.	
22) CarbonDisulfide	8.17	76	4182	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	10.06	96	105	N.D.	
25) 1,1-Dichloroethane	10.77	63	8297	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.48	43	226	N.D.	
28) 2-Butanone(MEK)	11.95	43	216	N.D.	
29) cis-1,2-Dichloroethene	13.03	96	103	N.D.	
30) Hexane	13.63	41	537	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	13.92	43	350	N.D.	

Page 34

(#) = qualifier out of range (m) = manual integration
09211725.D 082917.M Fri Sep 22 10:38:49 2017 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211725.D Vial: 8
Acq On : 22 Sep 2017 3:00 Operator: JJG
Sample : 171450-103298 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:38 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

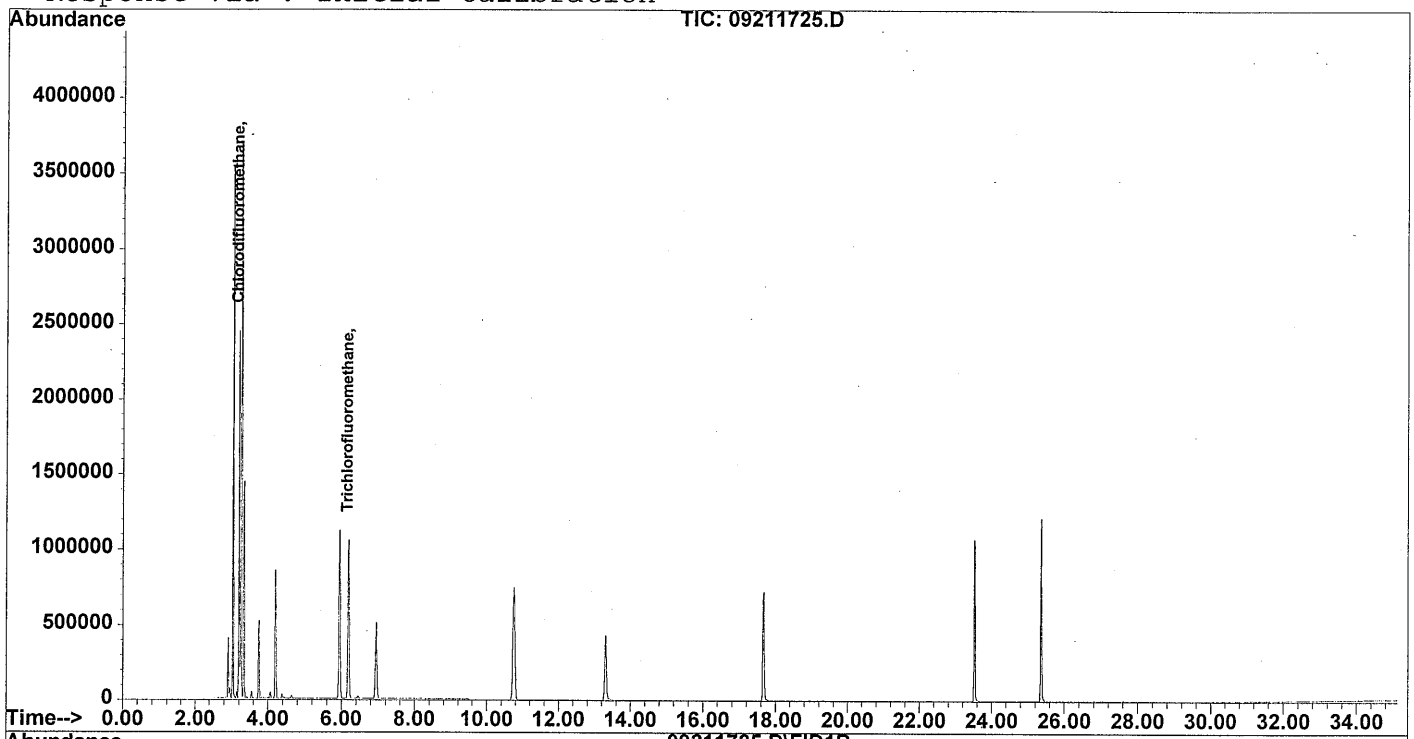
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.63	42	105	N.D.	
34) 1,2-Dichloroethane	15.42	62	128	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.82	78	539	N.D.	
38) CarbonTetrachloride	17.16	117	123	N.D.	
39) Cyclohexane	17.32	84	95	N.D.	
40) 1,2-Dichloropropane	18.30	63	92	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45) Heptane	19.32	71	133	N.D.	
46) cis-1,3-Dichloropropene	19.97	75	91	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.36	91	96	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	23.54	114	312	N.D.	
57) Ethylbenzene	24.06	91	339	N.D.	
58) m&p-Xylene	24.28	106	247	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	24.71	104	764	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	24.84	91	291	N.D.	
64) 4-Ethyltoluene	26.32	105	122	N.D.	
65) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
66) 1,2,4-Trimethylbenzene	27.01	105	337	N.D.	
67) BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68) 1,3-Dichlorobenzene	27.28	146	106	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	106	N.D.	
70) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
71) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
72) Hexachlorobutadiene	0.00	225	0	N.D.	

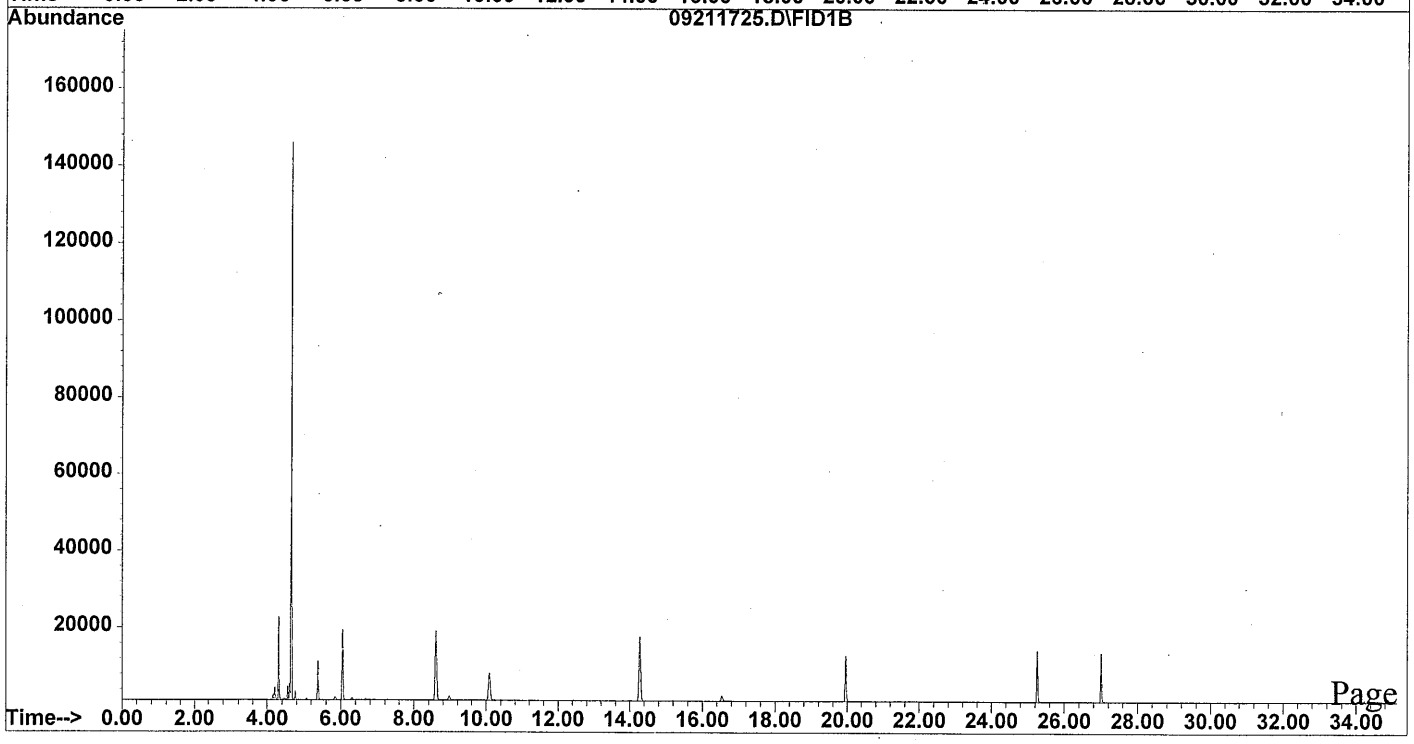
(#) = qualifier out of range (m) = manual integration
09211725.D 082917.M Fri Sep 22 10:38:49 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211725.D Vial: 8
Acq On : 22 Sep 2017 3:00 Operator: JJG
Sample : 171450-103298 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:38 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





09211725.D 082917.M Fri Sep 22 10:38:50 2017 Page 3

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211713.D Vial: 8
Acq On : 21 Sep 2017 6:02 pm Operator: JJG
Sample : 171450-103298 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.04	777.64 ppbv	6018840	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	74
2	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	5
4	2-Aminoimidazole	83	C3H5N3	000000-00-0	4
5	2-Propynenitrile, 3-fluoro-	69	C3FN	032038-83-8	3

****
Peak Number 2 Ethane, 1,1-difluoro- Concentration Rank 10

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.13	11.02 ppbv	85328	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethane, 1,1-difluoro-	66	C2H4F2	000075-37-6	90
2	Ethane, 1,1-difluoro-	66	C2H4F2	000075-37-6	58
3	Propiolonitrile	51	C3HN	001070-71-9	3
4	Ethane, 1,1,2,2-tetrafluoro-	102	C2H2F4	000359-35-3	2
5	1H-Benzimidazole-2-ethanol	162	C9H10N2O	004857-01-6	1

****
Peak Number 3 Ethene, 1-chloro-1-fluoro- Concentration Rank 9

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.55	11.57 ppbv	89520	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	91
2	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	83
3	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	64
4	cis-1,5-Cyclooctanediol	144	C8H16O2	023418-82-8	9
5	1H-Pyrrole, 3-ethyl-	95	C6H9N	001551-16-2	9

Page 37

****
Peak Number 4 Isobutane Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.

DA 09/25/17

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.76	154.09 ppbv	1192600	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	59
2	Isobutane	58	C4H10	000075-28-5	50
3	Isobutane	58	C4H10	000075-28-5	42
4	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9
5	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9

****

Peak Number 5 1-Propene, 2-methyl- Concentration Rank 8

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.07	17.02 ppbv	131705	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	1-Propene, 2-methyl-	56	C4H8	000115-11-7	90
2	1-Propene, 2-methyl-	56	C4H8	000115-11-7	90
3	1-Butene	56	C4H8	000106-98-9	87
4	1-Butene	56	C4H8	000106-98-9	87
5	1-Butene	56	C4H8	000106-98-9	87

****

Peak Number 6 Butane Concentration Rank 4

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.21	250.55 ppbv	1939200	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	80
2	Butane	58	C4H10	000106-97-8	43
3	Isobutane	58	C4H10	000075-28-5	9
4	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
5	Isobutane	58	C4H10	000075-28-5	9

****

Peak Number 7 Butane, 2-methyl- Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.95	523.84 ppbv	4054420	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	64
2	Butane, 2-methyl-	72	C5H12	000078-78-4	46
3	Butane, 2-methyl-	72	C5H12	000078-78-4	43
4	1-Propene, 2-methyl-	56	C4H8	000115-11-7	10
5	1-Propene, 2-methyl-	56	C4H8	000115-11-7	9

****

Peak Number 8 Pentane Concentration Rank 5

DA 09/25/17

R.T.	EstConc	Area	Relative to ISTD	R.T.
6.96	221.86 ppbv	1717190	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Pentane	72	C5H12	000109-66-0	86
2	Pentane	72	C5H12	000109-66-0	72
3	Pentane	72	C5H12	000109-66-0	72
4	Butane, 2-methyl-	72	C5H12	000078-78-4	64
5	Butane, 2-methyl-	72	C5H12	000078-78-4	64

****

Peak Number 9 Cyclopentane Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.77	509.07 ppbv	3940100	Bromochloromethane	13.33

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	86
2	Cyclopropane, ethyl-	70	C5H10	001191-96-4	80
3	Cyclopropane, ethyl-	70	C5H10	001191-96-4	78
4	Cyclobutanone	70	C4H6O	001191-95-3	72
5	Cyclobutane, methyl-	70	C5H10	000598-61-8	72

09211713.D 082917.M Mon Sep 25 13:32:09 2017

DA 09/25/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211710.D Vial: 5
Acq On : 21 Sep 2017 15:47 Operator: JJG
Sample : 171450-103302 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:35 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.36	130	299817m	10.00 ppbv	0.02
36) 1,4-Difluorobenzene	17.69	114	973133	10.00 ppbv	0.00
55) Chlorobenzene-d5	23.54	117	791242	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	519485	9.95 ppbv	0.00
Spiked Amount 10.000			Recovery	= 99.50%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	4995869	2064.26 ppbv	#
3) Propene	3.23	41	238131m	299.40 ppbv	
4) Dichlorodifluoromethane	3.35	85	6421658	2132.27 ppbv	
5) Chloromethane	3.58	52	1268	N.D.	
6) Dichlorotetrafluoroethane	3.76	135	473	N.D.	
7) VinylChloride	3.91	62	604	N.D.	
8) Methanol	3.94	31	213	N.D.	
9) 1,3-Butadiene	4.14	54	1656	N.D.	
10) Bromomethane	4.54	96	222	N.D.	
11) Chloroethane	4.83	64	103	N.D.	
12) Dichlorofluoromethane	5.08	67	1309	N.D.	
13) Ethanol	5.32	31	96	N.D.	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	6.24	43	15397	N.D.	
16) Trichlorofluoromethane	6.21	103	2955229	1897.45 ppbv	
17) 2-Propanol(IPA)	6.69	45	113	N.D.	
18) Acrylonitrile	6.97	52	266	N.D.	
19) 1,1-Dichloroethene	7.51	96	122	N.D.	
20) MethyleneChloride(DCM)	7.84	84	2063	N.D.	
21) AllylChloride	8.10	39	105	N.D.	
22) CarbonDisulfide	8.19	76	4282	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.80	63	4686	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.57	43	160	N.D.	
28) 2-Butanone(MEK)	12.09	43	106	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.67	41	592	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	13.91	43	111	N.D.	

Page 40

(#) = qualifier out of range (m) = manual integration
09211710.D 082917.M Thu Sep 21 17:36:30 2017

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211710.D Vial: 5
Acq On : 21 Sep 2017 15:47 Operator: JJG
Sample : 171450-103302 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:35 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33)	Tetrahydrofuran	14.69	42	91	N.D.	
34)	1,2-Dichloroethane	0.00	62	0	N.D.	
35)	1,1,1-Trichloroethane	0.00	97	0	N.D.	
37)	Benzene	16.84	78	190	N.D.	
38)	CarbonTetrachloride	0.00	117	0	N.D.	
39)	Cyclohexane	0.00	84	0	N.D.	
40)	1,2-Dichloropropane	18.30	63	96	N.D.	
41)	Bromodichloromethane	0.00	85	0	N.D.	
42)	1,4-Dioxane	18.86	88	92	N.D.	
43)	Trichloroethene(TCE)	0.00	130	0	N.D.	
44)	2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45)	Heptane	0.00	71	0	N.D.	
46)	cis-1,3-Dichloropropene	20.12	75	100	N.D.	
47)	4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48)	trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49)	1,1,2-Trichloroethane	0.00	97	0	N.D.	
50)	Toluene	21.36	91	1407	N.D.	
51)	2-Hexanone(MBK)	0.00	58	0	N.D.	
52)	Dibromochloromethane	0.00	129	0	N.D.	
53)	1,2-Dibromoethane	0.00	107	0	N.D.	
54)	Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56)	Chlorobenzene	23.54	114	204	N.D.	
57)	Ethylbenzene	24.05	91	367	N.D.	
58)	m&p-Xylene	24.29	106	315	N.D.	
59)	Bromoform	0.00	173	0	N.D.	
60)	Styrene	24.71	104	1717	N.D.	
61)	1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62)	o-Xylene	24.82	91	145	N.D.	
64)	4-Ethyltoluene	26.39	105	187	N.D.	
65)	1,3,5-Trimethylbenzene	26.48	105	135	N.D.	
66)	1,2,4-Trimethylbenzene	27.00	105	322	N.D.	
67)	BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68)	1,3-Dichlorobenzene	27.27	146	214	N.D.	
69)	1,4-Dichlorobenzene	27.27	146	214	N.D.	
70)	1,2-Dichlorobenzene	27.74	146	104	N.D.	
71)	1,2,4-Trichlorobenzene	30.31	180	277	N.D.	
72)	Hexachlorobutadiene	31.08	225	172	N.D.	

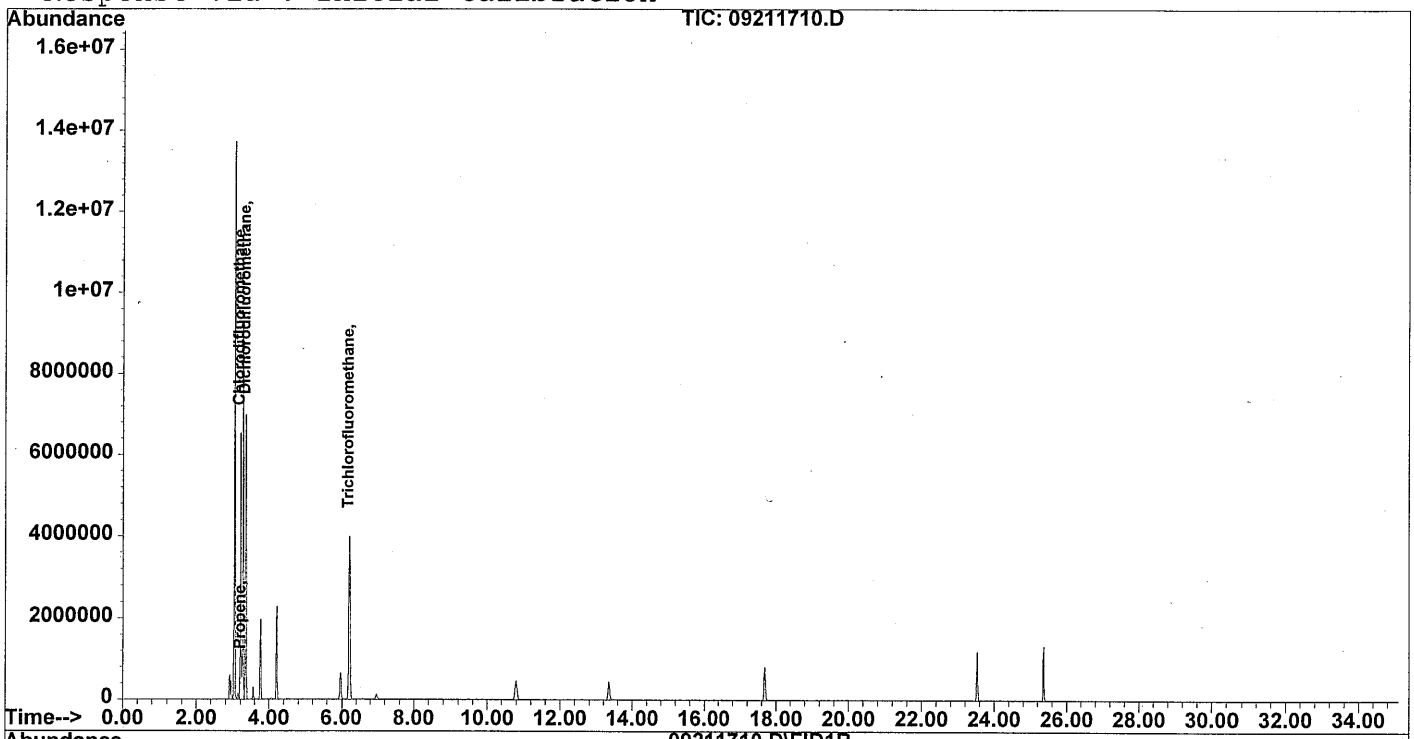
(#) = qualifier out of range (m) = manual integration
09211710.D 082917.M Thu Sep 21 17:36:32 2017

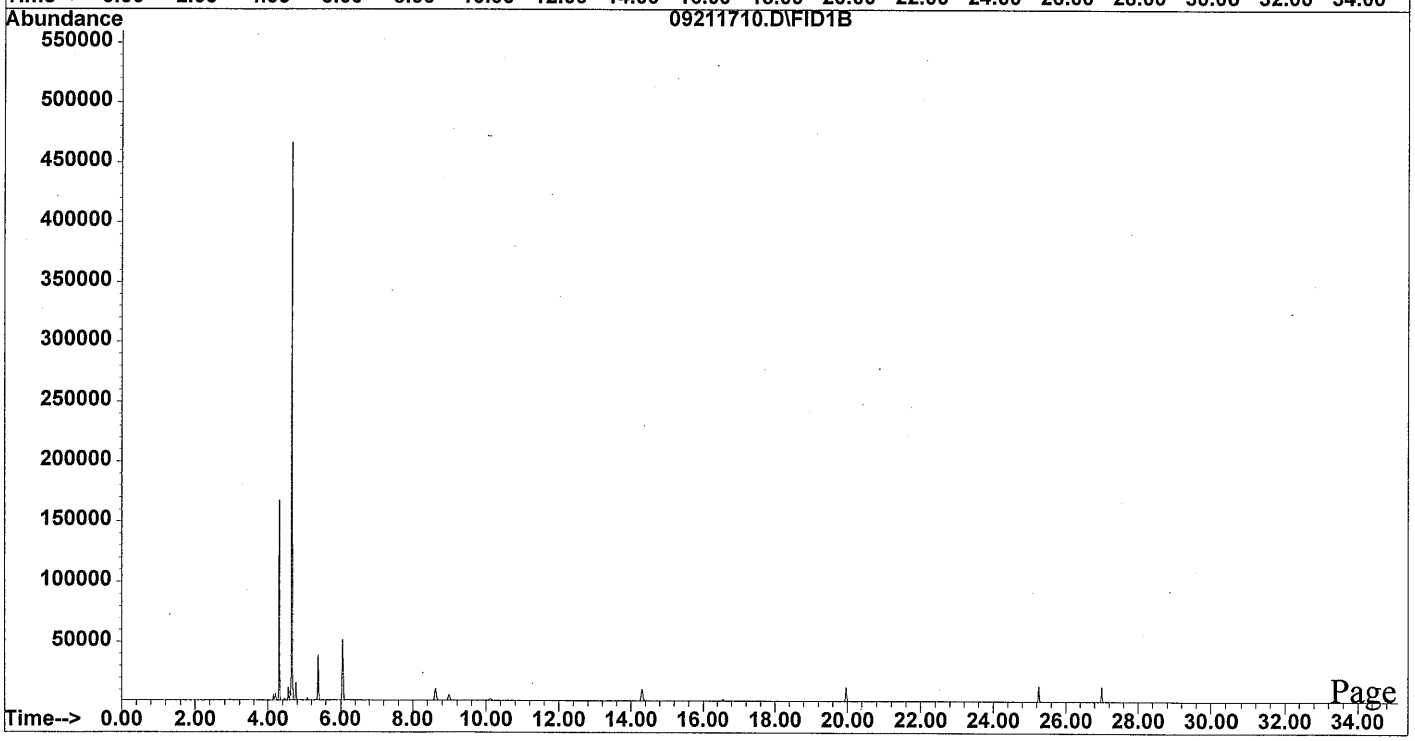
09/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211710.D Vial: 5
Acq On : 21 Sep 2017 15:47 Operator: JJG
Sample : 171450-103302 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 17:35 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211723.D Vial: 4
Acq On : 22 Sep 2017 1:31 Operator: JJG
Sample : 171450-103302 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.40	130	282927	10.00 ppbv	0.06
36) 1,4-Difluorobenzene	17.72	114	927897	10.00 ppbv	0.03
55) Chlorobenzene-d5	23.54	117	734880	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	488175	10.07 ppbv	0.00
Spiked Amount 10.000			Recovery	= 100.70%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.21	51	246633	2699.76 ppbv	
3) Propene	3.24	41	5492	N.D.	
4) Dichlorodifluoromethane	3.35	85	380796	3349.73 ppbv	
5) Chloromethane	0.00	52	0	N.D.	
6) Dichlorotetrafluoroethane	0.00	135	0	N.D.	
7) VinylChloride	0.00	62	0	N.D.	
8) Methanol	3.90	31	105	N.D.	
9) 1,3-Butadiene	4.16	54	248	N.D.	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.79	64	233	N.D.	
12) Dichlorofluoromethane	0.00	67	0	N.D.	
13) Ethanol	0.00	31	0	N.D. d	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	5.99	43	14185	N.D.	
16) Trichlorofluoromethane	6.23	103	136034	2313.92 ppbv	
17) 2-Propanol(IPA)	6.73	45	475	N.D.	
18) Acrylonitrile	6.97	52	242	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.88	84	1108	N.D.	
21) AllylChloride	8.15	39	180	N.D.	
22) CarbonDisulfide	8.24	76	2283	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.86	63	90	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.73	43	763	N.D.	
28) 2-Butanone(MEK)	12.15	43	99	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.76	41	829	N.D.	
31) Chloroform	13.82	83	93	N.D.	
32) EthylAcetate	14.05	43	350	N.D.	

Page 43

(#) = qualifier out of range (m) = manual integration
09211723.D 082917.M Fri Sep 22 10:37:13 2017

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211723.D Vial: 4
Acq On : 22 Sep 2017 1:31 Operator: JJG
Sample : 171450-103302 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

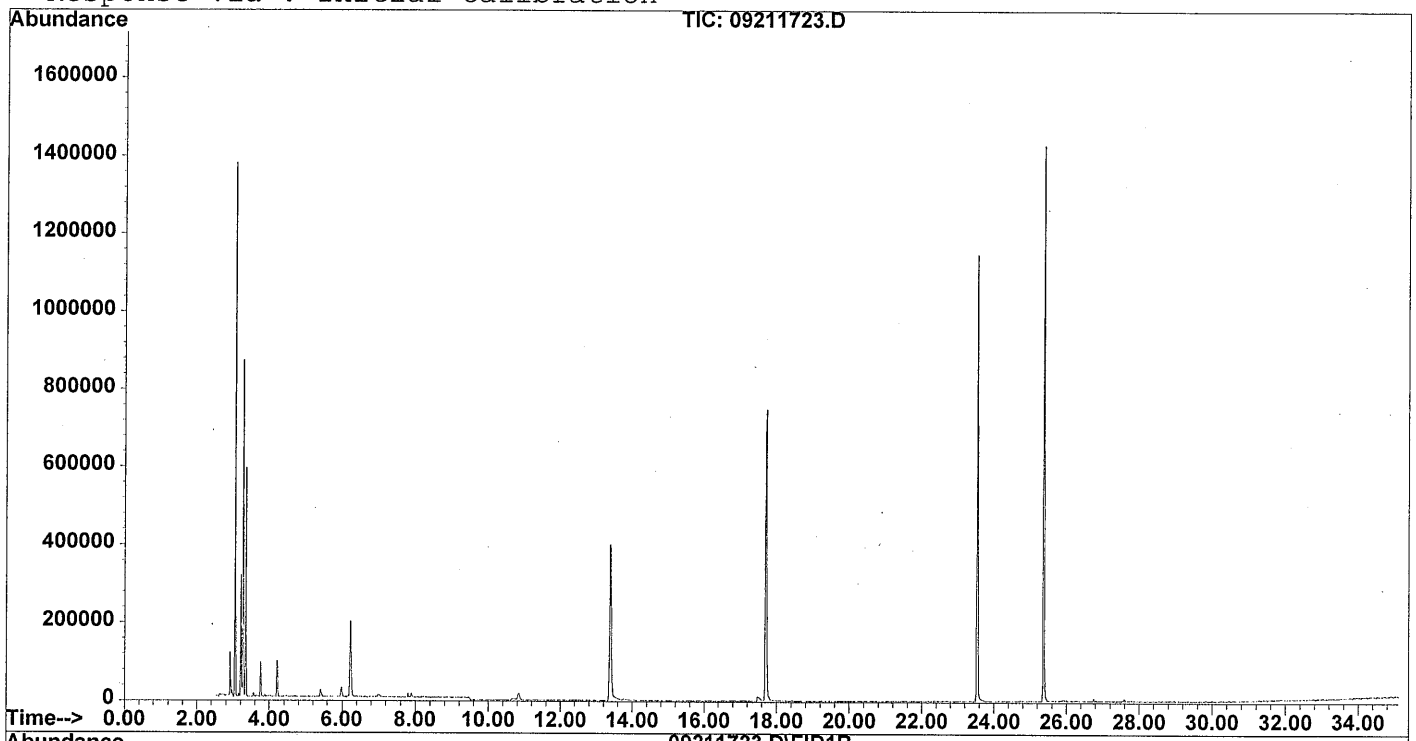
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.81	42	210	N.D.	
34) 1,2-Dichloroethane	0.00	62	0	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.85	78	256	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	0.00	84	0	N.D.	
40) 1,2-Dichloropropane	18.39	63	116	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45) Heptane	0.00	71	0	N.D.	
46) cis-1,3-Dichloropropene	20.18	75	99	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.38	91	217	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	23.49	114	107	N.D.	
57) Ethylbenzene	24.07	91	187	N.D.	
58) m&p-Xylene	24.29	106	215	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	24.71	104	103	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	24.75	91	89	N.D.	
64) 4-Ethyltoluene	26.36	105	382	N.D.	
65) 1,3,5-Trimethylbenzene	26.48	105	217	N.D.	
66) 1,2,4-Trimethylbenzene	27.01	105	348	N.D.	
67) BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68) 1,3-Dichlorobenzene	27.30	146	148	N.D.	
69) 1,4-Dichlorobenzene	27.30	146	148	N.D.	
70) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
71) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
72) Hexachlorobutadiene	0.00	225	0	N.D.	

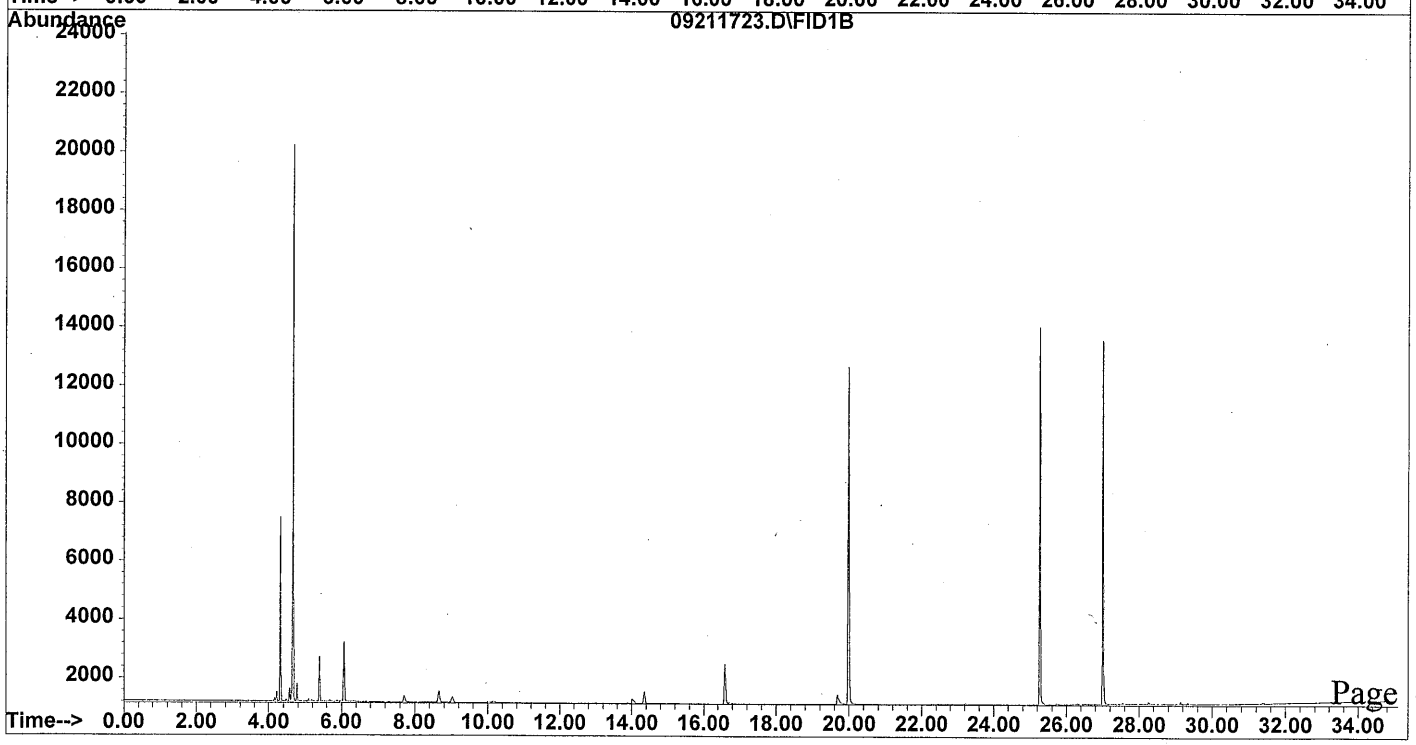
(#) = qualifier out of range (m) = manual integration
09211723.D 082917.M Fri Sep 22 10:37:14 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211723.D Vial: 4
Acq On : 22 Sep 2017 1:31 Operator: JJG
Sample : 171450-103302 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





9/22/17

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211710.D Vial: 5
Acq On : 21 Sep 2017 3:47 pm Operator: JJG
Sample : 171450-103302 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

Dilution x500

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.04	2605.24 ppbv	19909700	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	78
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
5	1H-Imidazol-2-amine, sulfate (2:1)	83	C3H5N3	001450-93-7	4

****
Peak Number 2 Ethene, 1-chloro-1-fluoro- Concentration Rank 7

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.56	50.63 ppbv	386958	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	97
2	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	90
3	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	81
4	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	80
5	2-Hexen-4-yne, (Z)-	80	C6H8	030626-48-3	36

****
Peak Number 3 Isobutane Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.78	444.33 ppbv	3395620	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	45
2	Isobutane	58	C4H10	000075-28-5	45
3	Isobutane	58	C4H10	000075-28-5	42
4	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9
5	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9

Page 46

****
Peak Number 4 Butane Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.

DA 09/25/17

4.23	570.49 ppbv	4359750	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	72
2	Butane	58	C4H10	000106-97-8	64
3	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
4	Isobutane	58	C4H10	000075-28-5	9
5	Hydrogen azide	43	HN3	007782-79-8	5

****

Peak Number 5 Butane, 2-methyl- Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.97	216.71 ppbv	1656150	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	78
2	Butane, 2-methyl-	72	C5H12	000078-78-4	64
3	Butane, 2-methyl-	72	C5H12	000078-78-4	49
4	1-Propene, 2-methyl-	56	C4H8	000115-11-7	9
5	Methane, isocyanato-	57	C2H3NO	000624-83-9	9

****

Peak Number 6 Pentane Concentration Rank 8

R.T.	EstConc	Area	Relative to ISTD	R.T.
6.97	42.99 ppbv	328574	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Pentane	72	C5H12	000109-66-0	86
2	Pentane	72	C5H12	000109-66-0	80
3	Pentane	72	C5H12	000109-66-0	80
4	Butane, 2-methyl-	72	C5H12	000078-78-4	64
5	Butane, 2-methyl-	72	C5H12	000078-78-4	42

****

Peak Number 7 Cyclopentane Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.80	223.99 ppbv	1711760	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	86
2	Cyclopropane, ethyl-	70	C5H10	001191-96-4	78
3	Cyclobutane, methyl-	70	C5H10	000598-61-8	50
4	Cyclobutanone	70	C4H6O	001191-95-3	50
5	1-Pentene	70	C5H10	000109-67-1	50

09211710.D 082917.M Mon Sep 25 13:29:42 2017

BA 09/25/17

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211723.D Vial: 4
Acq On : 22 Sep 2017 1:31 am Operator: JJG
Sample : 171450-103302 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.05	5566.29 ppbv	1608740	Bromochloromethane	13.40

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	83
2	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	4
4	1-Methyl-1H-1,2,4-triazole	83	C3H5N3	006086-21-1	4
5	2-Propynenitrile, 3-fluoro-	69	C3FN	032038-83-8	3

09211723.D 082917.M Mon Sep 25 21:28:20 2017

09/25/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211712.D Vial: 7
Acq On : 21 Sep 2017 17:17 Operator: JJG
Sample : 171450-103306 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 18:07 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.36	130	292269	10.00 ppbv	0.02
36) 1,4-Difluorobenzene	17.69	114	963573	10.00 ppbv	0.00
55) Chlorobenzene-d5	23.54	117	848632	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	526283	9.40 ppbv	0.00
Spiked Amount 10.000			Recovery	= 94.00%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	2267369	961.06 ppbv	
3) Propene	3.23	41	125674m	162.09 ppbv	
4) Dichlorodifluoromethane	3.34	85	1870594	637.16 ppbv	
5) Chloromethane	3.58	52	852	N.D.	
6) Dichlorotetrafluoroethane	0.00	135	0	N.D.	
7) VinylChloride	3.91	62	795	N.D.	
8) Methanol	3.91	31	109	N.D.	
9) 1,3-Butadiene	4.10	54	92	N.D.	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.85	64	240	N.D.	
12) Dichlorofluoromethane	5.06	67	113	N.D.	
13) Ethanol	5.21	31	103	N.D.	
14) VinylBromide	5.36	108	94	N.D.	
15) Acetone	6.04	43	172	N.D.	
16) Trichlorofluoromethane	6.22	103	161130	106.13 ppbv	
17) 2-Propanol(IPA)	6.69	45	321	N.D.	
18) Acrylonitrile	7.03	52	95	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.84	84	1022	N.D.	
21) AllylChloride	8.04	39	125	N.D.	
22) CarbonDisulfide	8.22	76	4849	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	10.21	96	152	N.D.	
25) 1,1-Dichloroethane	10.77	63	94	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.54	43	107	N.D.	
28) 2-Butanone(MEK)	12.12	43	238	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.70	41	1126	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	14.00	43	109	N.D.	

Page 49

(#) = qualifier out of range (m) = manual integration
09211712.D 082917.M Thu Sep 21 18:07:42 2017

Page 1

9/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211712.D Vial: 7
Acq On : 21 Sep 2017 17:17 Operator: JJG
Sample : 171450-103306 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 18:07 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.82	42	104	N.D.	
34) 1,2-Dichloroethane	0.00	62	0	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.84	78	432	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	0.00	84	0	N.D.	
40) 1,2-Dichloropropane	18.30	63	92	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	18.88	57	106	N.D.	
45) Heptane	0.00	71	0	N.D.	
46) cis-1,3-Dichloropropene	20.15	75	105	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.36	91	332	N.D.	
51) 2-Hexanone(MBK)	21.92	58	125	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	0.00	114	0	N.D.	
57) Ethylbenzene	24.06	91	99	N.D.	
58) m&p-Xylene	24.26	106	123	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	24.71	104	1041	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	24.84	91	107	N.D.	
64) 4-Ethyltoluene	26.38	105	102	N.D.	
65) 1,3,5-Trimethylbenzene	26.48	105	115	N.D.	
66) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.	
67) BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
69) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
70) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	316	N.D.	
72) Hexachlorobutadiene	31.08	225	196	N.D.	

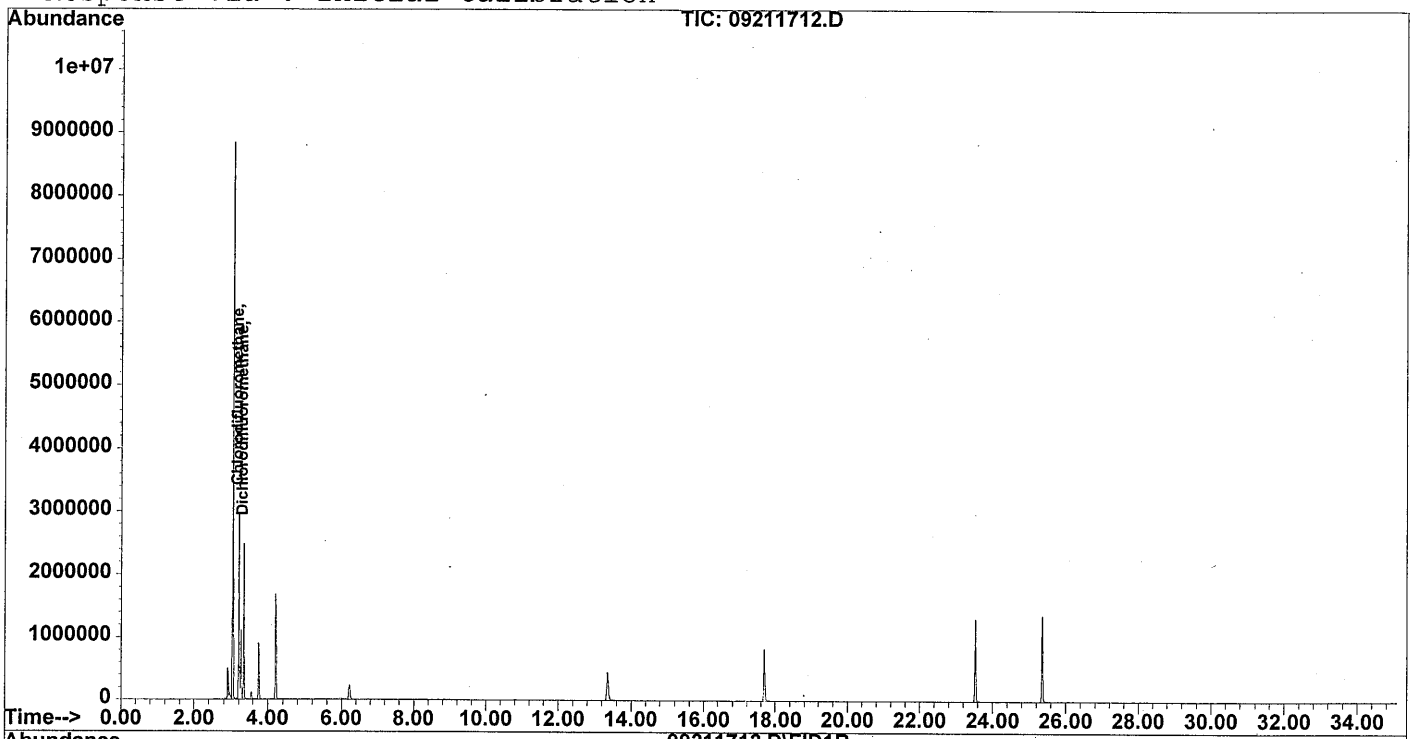
(#) = qualifier out of range (m) = manual integration
09211712.D 082917.M Thu Sep 21 18:07:42 2017

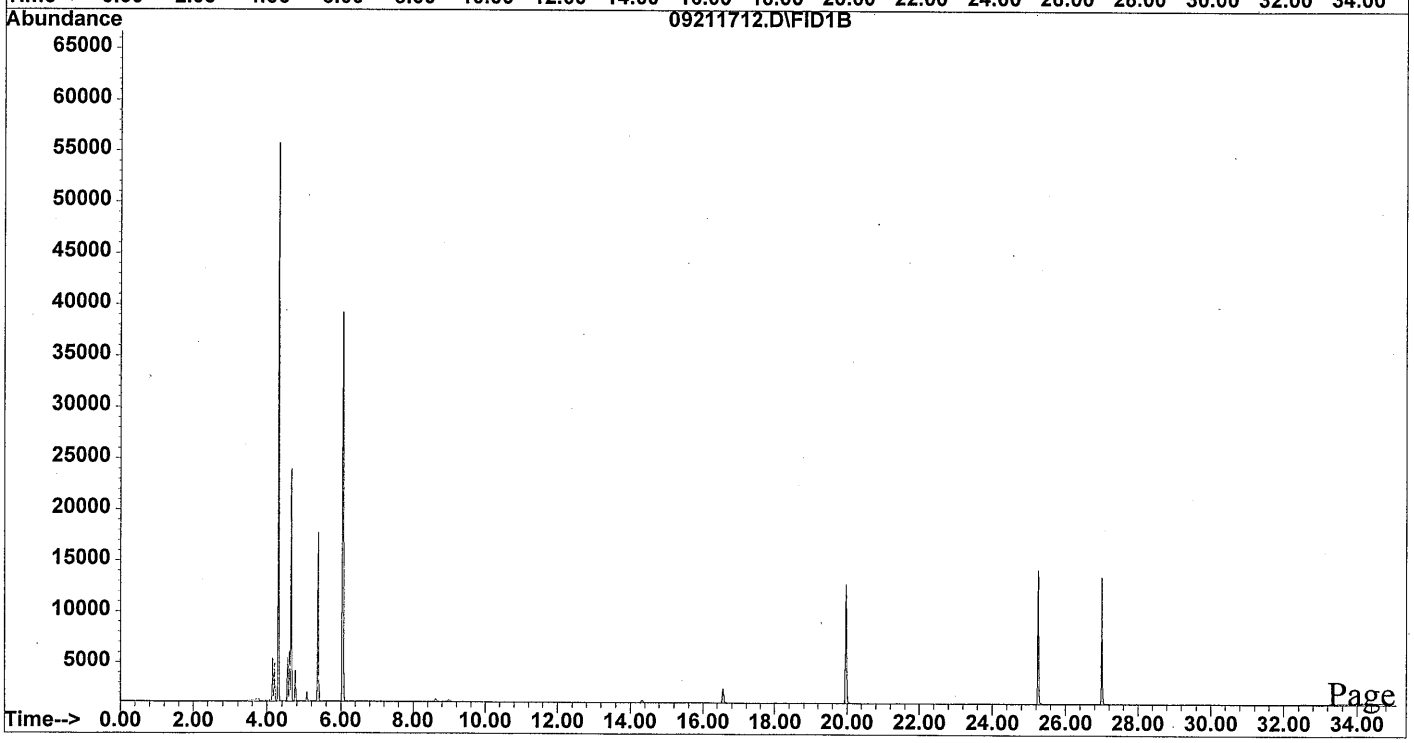
9/29/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211712.D Vial: 7
Acq On : 21 Sep 2017 17:17 Operator: JJG
Sample : 171450-103306 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 18:07 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211724.D Vial: 7
Acq On : 22 Sep 2017 2:15 Operator: JJG
Sample : 171450-103306 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.34	130	280808	10.00 ppbv	0.00
36) 1,4-Difluorobenzene	17.69	114	901524	10.00 ppbv	0.00
55) Chlorobenzene-d5	23.55	117	759742	10.00 ppbv	0.02
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.39	174	482367	9.63 ppbv	0.02
Spiked Amount 10.000			Recovery	= 96.30%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.23	51	1871360	1031.97 ppbv	#
3) Propene	3.26	41	100824	169.18 ppbv	
4) Dichlorodifluoromethane	3.36	85	1426215	632.03 ppbv	
5) Chloromethane	3.59	52	676	N.D.	
6) Dichlorotetrafluoroethane	0.00	135	0	N.D.	
7) VinylChloride	3.93	62	541	N.D.	
8) Methanol	3.87	31	92	N.D.	
9) 1,3-Butadiene	4.23	54	2368	N.D.	
10) Bromomethane	4.38	96	122	N.D.	
11) Chloroethane	4.86	64	101	N.D.	
12) Dichlorofluoromethane	5.01	67	131	N.D.	
13) Ethanol	5.34	31	196	N.D.	
14) VinylBromide	5.28	108	90	N.D.	
15) Acetone	5.97	43	7263	N.D.	
16) Trichlorofluoromethane	6.21	103	115936	99.35 ppbv	
17) 2-Propanol(IPA)	6.68	45	104	N.D.	
18) Acrylonitrile	6.85	52	92	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.85	84	1457	N.D.	
21) AllylChloride	8.08	39	328	N.D.	
22) CarbonDisulfide	8.20	76	4161	N.D.	
23) Trichlorotrifluoroethane	8.51	103	91	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	0.00	63	0	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.47	43	108	N.D.	
28) 2-Butanone(MEK)	12.00	43	99	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.65	41	648	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	14.01	43	111	N.D.	

Page 52

(#) = qualifier out of range (m) = manual integration
09211724.D 082917.M Fri Sep 22 10:38:18 2017

Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211724.D Vial: 7
Acq On : 22 Sep 2017 2:15 Operator: JJG
Sample : 171450-103306 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

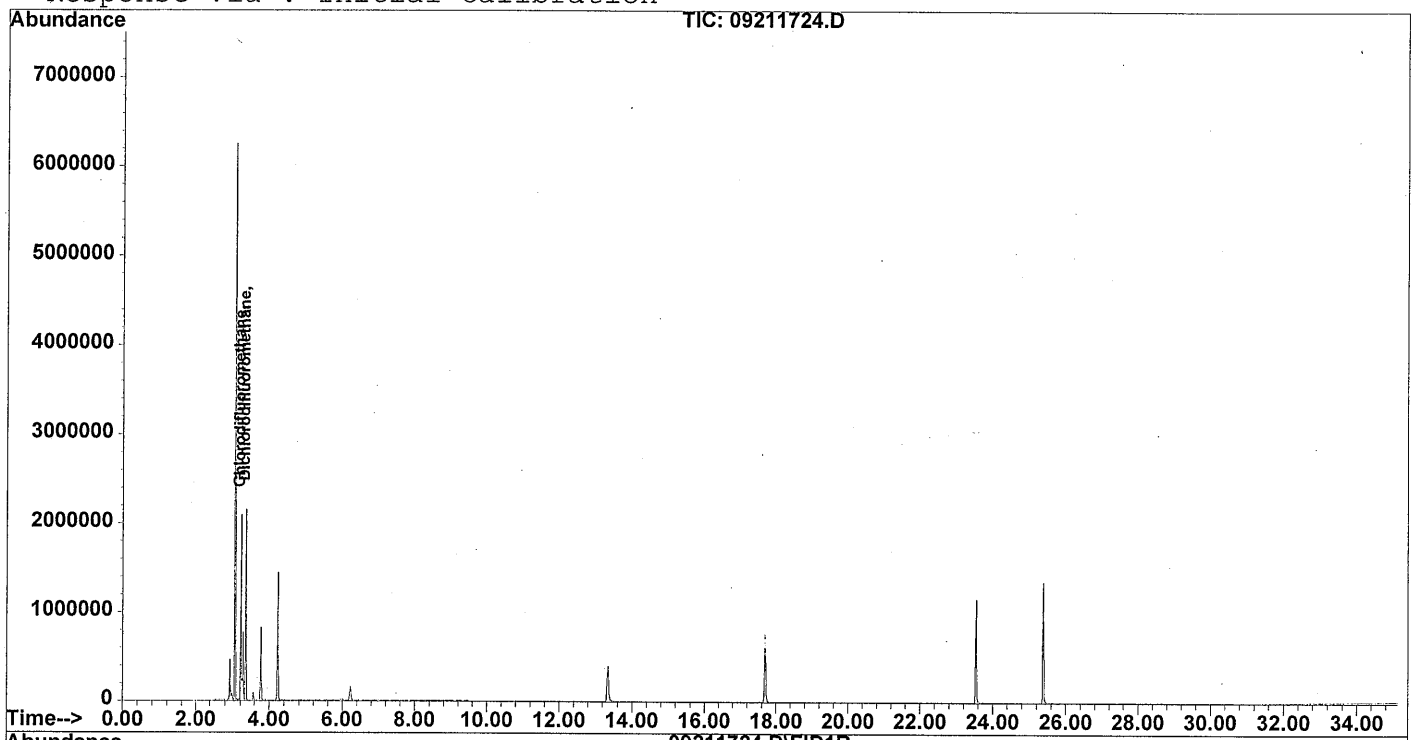
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.87	42	104	N.D.	
34) 1,2-Dichloroethane	0.00	62	0	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.84	78	290	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	0.00	84	0	N.D.	
40) 1,2-Dichloropropane	18.23	63	139	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	0.00	57	0	N.D.	
45) Heptane	0.00	71	0	N.D.	
46) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.38	91	465	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56) Chlorobenzene	0.00	114	0	N.D.	
57) Ethylbenzene	0.00	91	0	N.D.	
58) m&p-Xylene	24.28	106	130	N.D.	
59) Bromoform	0.00	173	0	N.D.	
60) Styrene	24.72	104	758	N.D.	
61) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62) o-Xylene	0.00	91	0	N.D.	
64) 4-Ethyltoluene	26.39	105	95	N.D.	
65) 1,3,5-Trimethylbenzene	26.39	105	95	N.D.	
66) 1,2,4-Trimethylbenzene	27.01	105	142	N.D.	
67) BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68) 1,3-Dichlorobenzene	27.30	146	99	N.D.	
69) 1,4-Dichlorobenzene	27.30	146	99	N.D.	
70) 1,2-Dichlorobenzene	27.77	146	122	N.D.	
71) 1,2,4-Trichlorobenzene	30.33	180	99	N.D.	
72) Hexachlorobutadiene	0.00	225	0	N.D.	

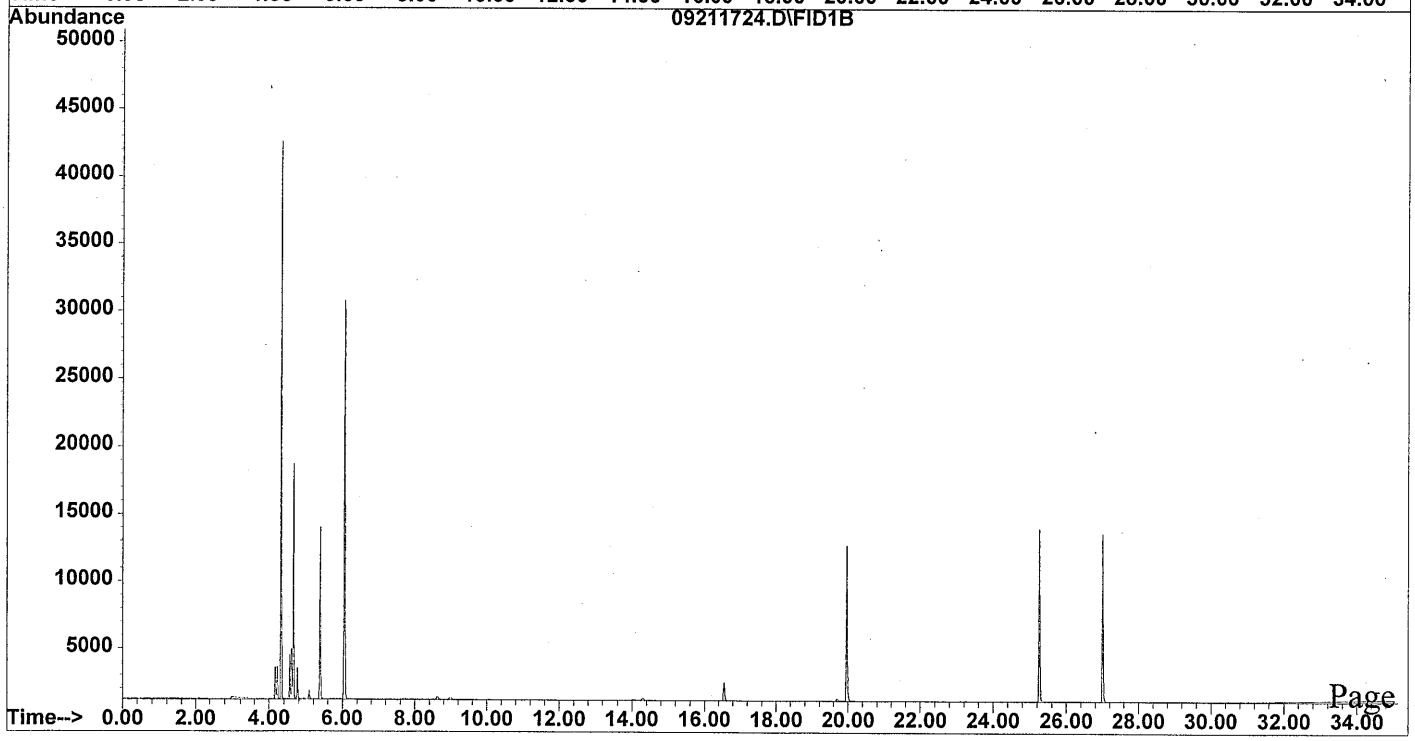
(#) = qualifier out of range (m) = manual integration
09211724.D 082917.M Fri Sep 22 10:38:19 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211724.D Vial: 7
Acq On : 22 Sep 2017 2:15 Operator: JJG
Sample : 171450-103306 x25 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 20mL Multiplr: 25.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 22 10:37 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211712.D Vial: 7
Acq On : 21 Sep 2017 5:17 pm Operator: JJG
Sample : 171450-103306 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.04	1445.42 ppbv	10933600	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	40
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	4
5	2-Aminoimidazole	83	C3H5N3	000000-00-0	4

****
Peak Number 2 Ethene, 1-chloro-1-fluoro- Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.56	21.99 ppbv	166312	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	94
2	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	87
3	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	80
4	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	80
5	1,3-Diazine	80	C4H4N2	000289-95-2	42

****
Peak Number 3 Isobutane Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.76	216.45 ppbv	1637310	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	50
2	Isobutane	58	C4H10	000075-28-5	45
3	Isobutane	58	C4H10	000075-28-5	36
4	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9
5	Propane, 1-nitro-	89	C3H7NO2	000108-03-2	9

Page 55

****
Peak Number 4 Butane Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.

DA 09/25/17

4.21	425.45 ppbv	3218260	Bromochloromethane	13.36

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	72
2	Butane	58	C4H10	000106-97-8	50
3	Isobutane	58	C4H10	000075-28-5	9
4	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
5	Isobutane	58	C4H10	000075-28-5	7

09211712.D 082917.M Mon Sep 25 13:30:21 2017

DA 09/25/17

TO-15 RAW QC & ICAL SUMMARY

MS #2 Instrument Logbook

Sequence Name: C:\HPCHEM\1\SEQUENCE\2017\092117.S
Comment: GCMS-02
Operator: JJG
Data Path: C:\HPCHEM\1\MS02\2017\092117\
Pre-Seq Cmd:
Post-Seq Cmd:

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	41	09211701	TO15G	TO15 BFB 092117
2	Sample	41	09211702	TO15G	TO15 CCV 092117
3	Sample	41	09211703	TO15G	TO15 CCV 092117
4	Sample	41	09211704	TO15G	TO15 LCSD 092117
5	Sample	1	09211705	TO15G	TO15 MB 092117
6	Sample	2	09211706	TO15G	171435-103225 x1
7	Sample	2	09211707	TO15G	171435-103225 x1 dp
8	Sample	3	09211708	TO15G	171435-103226 x1
9	Sample	4	09211709	TO15G	171435-103227 x1
10	Sample	5	09211710	TO15G	171450-103302 x20
11	Sample	6	09211711	TO15G	171450-103294 x20
12	Sample	7	09211712	TO15G	171450-103306 x20
13	Sample	8	09211713	TO15G	171450-103298 x20
14	Sample	9	09211714	TO15G	171401-103037 x10
15	Sample	10	09211715	TO15G	171401-103038 x10
16	Sample	16	09211716	TO15G	171432-103192 x10
17	Sample	16	09211717	TO15G	171432-103192 x20
18	Sample	2	09211718	TO15G	171425-103181 x2500
19	Sample	2	09211719	TO15G	171425-103181 x5000
20	Sample	2	09211720	TO15G	171425-103181 x100
21	Sample	2	09211721	TO15G	171425-103181 x200
22	Sample	3	09211722	TO15G	171450-103294 x500
23	Sample	4	09211723	TO15G	171450-103302 x500
24	Sample	7	09211724	TO15G	171450-103306 x25
25	Sample	8	09211725	TO15G	171450-103298 x25
26	Sample	11	09211726	TO15G	171401-103037 x100
27	Sample	12	09211727	TO15G	171401-103038 x100
28	Sample	13	09211728	TO15G	171453-103319 x100
29	Sample	13	09211729	TO15G	171453-103319 x2500
30	Sample	14	09211730	TO15G	171453-103320 x100
31	Sample	14	09211731	TO15G	171453-103320 x2500
32	Sample	16	09211732	TO15G	Lab Air 092117 x1
33	Sample	15	09211733	TO15G	Can Check#000416

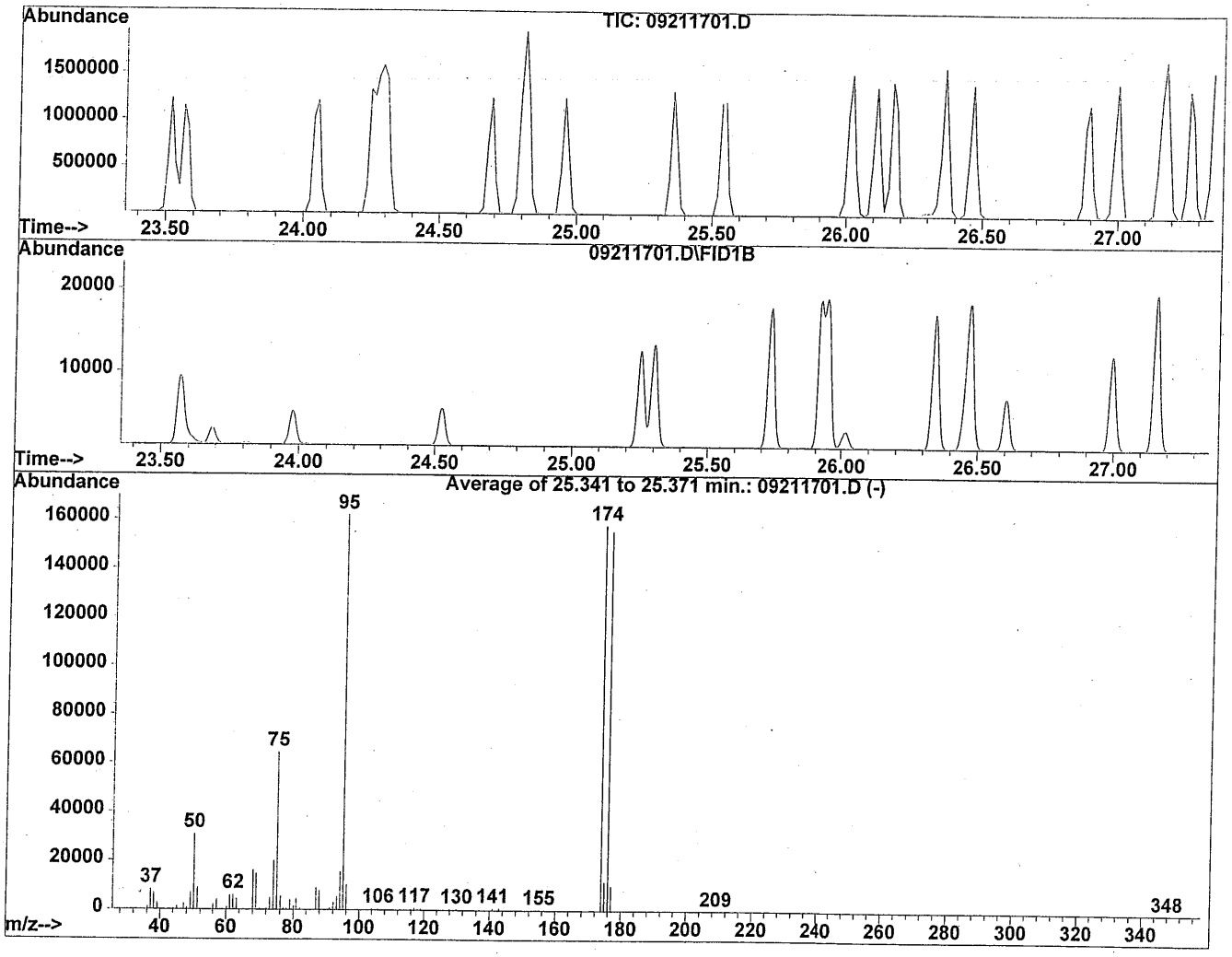
9/21/17

Comments: 9/21/17

Analyst: [signature] **Date:** 09/21/17

BFB

Data File : C:\HPCHEM\1\MS02\2017\092117\09211701.D Vial: 41
Acq On : 21 Sep 2017 9:00 am Operator: JJG
Sample : TO15 BFB 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 200mL Multiplr: 1.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14



AutoFind: Scans 1534, 1535, 1536; Background Corrected with Scan 1530

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	19.1	30923	PASS
75	95	30	60	39.8	64515	PASS
95	95	100	100	100.0	161916	PASS
96	95	5	9	6.3	10260	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	97.6	158008	PASS
175	174	5	9	7.5	11903	PASS
176	174	95	101	98.5	155629	PASS
177	176	5	9	6.5	10105	PASS

Page 59

09211701.D 082917.M Thu Sep 21 09:55:34 2017

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211703.D Vial: 41
Acq On : 21 Sep 2017 10:31 Operator: JJG
Sample : TO15 CCV 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:08 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.30	130	299925m	10.00 ppbv	-0.04
36) 1,4-Difluorobenzene	17.66	114	937907	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	747520	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	516124	10.47 ppbv	0.00
Spiked Amount 10.000			Recovery	= 104.70%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	539857	11.15 ppbv	
3) Propene	3.23	41	184549	11.60 ppbv	
4) Dichlorodifluoromethane	3.34	85	628439	10.43 ppbv	
5) Chloromethane	3.56	52	62327	10.44 ppbv	
6) Dichlorotetrafluoroethane	3.76	135	394926	10.80 ppbv	
7) VinylChloride	3.91	62	190243	9.92 ppbv	
8) Methanol	3.92	31	146422m	18.28 ppbv	
9) 1,3-Butadiene	4.13	54	126259	10.27 ppbv	
10) Bromomethane	4.52	96	242556	11.39 ppbv	
11) Chloroethane	4.84	64	83448	9.24 ppbv	
12) Dichlorofluoromethane	5.05	67	501933	11.14 ppbv	
13) Ethanol	5.24	31	168126m	8.47 ppbv	
14) VinylBromide	5.41	108	215062	10.78 ppbv	
15) Acetone	5.99	43	375304m	11.10 ppbv	
16) Trichlorofluoromethane	6.19	103	327095	10.50 ppbv	
17) 2-Propanol(IPA)	6.64	45	398605m	10.74 ppbv	
18) Acrylonitrile	6.86	52	136184m	11.14 ppbv	
19) 1,1-Dichloroethene	7.45	96	230047	12.50 ppbv	
20) MethyleneChloride(DCM)	7.79	84	202373	11.15 ppbv	
21) AllylChloride	8.06	39	200337m	10.44 ppbv	
22) CarbonDisulfide	8.14	76	644654	10.23 ppbv	
23) Trichlorotrifluoroethane	8.50	103	338735	11.00 ppbv	
24) trans-1,2-Dichloroethene	10.18	96	237059	11.07 ppbv	
25) 1,1-Dichloroethane	10.71	63	426510	10.93 ppbv	
26) MethylTertButylEther(MTBE)	11.18	73	553081	10.81 ppbv	
27) VinylAcetate	11.51	43	709674	11.07 ppbv	
28) 2-Butanone(MEK)	12.07	43	544910m	10.41 ppbv	
29) cis-1,2-Dichloroethene	12.94	96	228245	10.01 ppbv	
30) Hexane	13.61	41	263614	10.13 ppbv	
31) Chloroform	13.68	83	503957	10.97 ppbv	
32) EthylAcetate	13.94	43	628493	10.84 ppbv	

Page 60

(#) = qualifier out of range (m) = manual integration
09211703.D 082917.M Thu Sep 21 11:08:44 2017

Page 1

9/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211703.D Vial: 41
Acq On : 21 Sep 2017 10:31 Operator: JJG
Sample : TO15 CCV 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:08 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.72	42	249794m	9.84 ppbv	
34) 1,2-Dichloroethane	15.33	62	326571	10.84 ppbv	
35) 1,1,1-Trichloroethane	15.86	97	464311	11.05 ppbv	
37) Benzene	16.79	78	646710	11.32 ppbv	98
38) CarbonTetrachloride	17.07	117	491699	10.99 ppbv	99
39) Cyclohexane	17.29	84	244202	10.65 ppbv	96
40) 1,2-Dichloropropane	18.30	63	253757	10.25 ppbv	97
41) Bromodichloromethane	18.64	85	355008	10.99 ppbv	97
42) 1,4-Dioxane	18.86	88	153029m	9.71 ppbv	
43) Trichloroethene(TCE)	18.71	130	357168	10.90 ppbv	97
44) 2,2,4-Trimethylpentane	18.86	57	921789	9.89 ppbv	98
45) Heptane	19.34	71	178924	11.27 ppbv	97
46) cis-1,3-Dichloropropene	20.06	75	415207	11.45 ppbv	97
47) 4-Methyl-2-pentanone(MiBK)	20.22	58	224171	9.63 ppbv	96
48) trans-1,3-Dichloropropene	20.80	75	354398	9.92 ppbv	99
49) 1,1,2-Trichloroethane	20.98	97	328304	11.41 ppbv	98
50) Toluene	21.33	91	728370	10.71 ppbv	99
51) 2-Hexanone(MBK)	21.81	58	306004	10.56 ppbv	94
52) Dibromochloromethane	21.85	129	680697	10.24 ppbv	98
53) 1,2-Dibromoethane	22.15	107	564744	10.30 ppbv	98
54) Tetrachloroethene(PCE)	22.75	166	495472	11.41 ppbv	98
56) Chlorobenzene	23.58	114	210761	10.72 ppbv	90
57) Ethylbenzene	24.05	91	1006014	11.45 ppbv	98
58) m&p-Xylene	24.26	106	712706	21.98 ppbv	95
59) Bromoform	24.31	173	692978	11.24 ppbv #	95
60) Styrene	24.69	104	585469	11.09 ppbv	97
61) 1,1,2,2-Tetrachloroethane	24.81	83	711633	11.64 ppbv	99
62) o-Xylene	24.82	91	765120	11.42 ppbv	99
64) 4-Ethyltoluene	26.36	105	1070295	10.71 ppbv	97
65) 1,3,5-Trimethylbenzene	26.47	105	848334	10.69 ppbv	96
66) 1,2,4-Trimethylbenzene	27.00	105	841673	10.66 ppbv	95
67) BenzylChloride(a-Chlorotol	27.16	91	740861	10.36 ppbv	96
68) 1,3-Dichlorobenzene	27.19	146	690918	10.28 ppbv	96
69) 1,4-Dichlorobenzene	27.28	146	698975	10.30 ppbv	97
70) 1,2-Dichlorobenzene	27.74	146	656849	10.04 ppbv #	96
71) 1,2,4-Trichlorobenzene	30.31	180	547300m	9.10 ppbv	
72) Hexachlorobutadiene	31.08	225	454045m	9.01 ppbv	

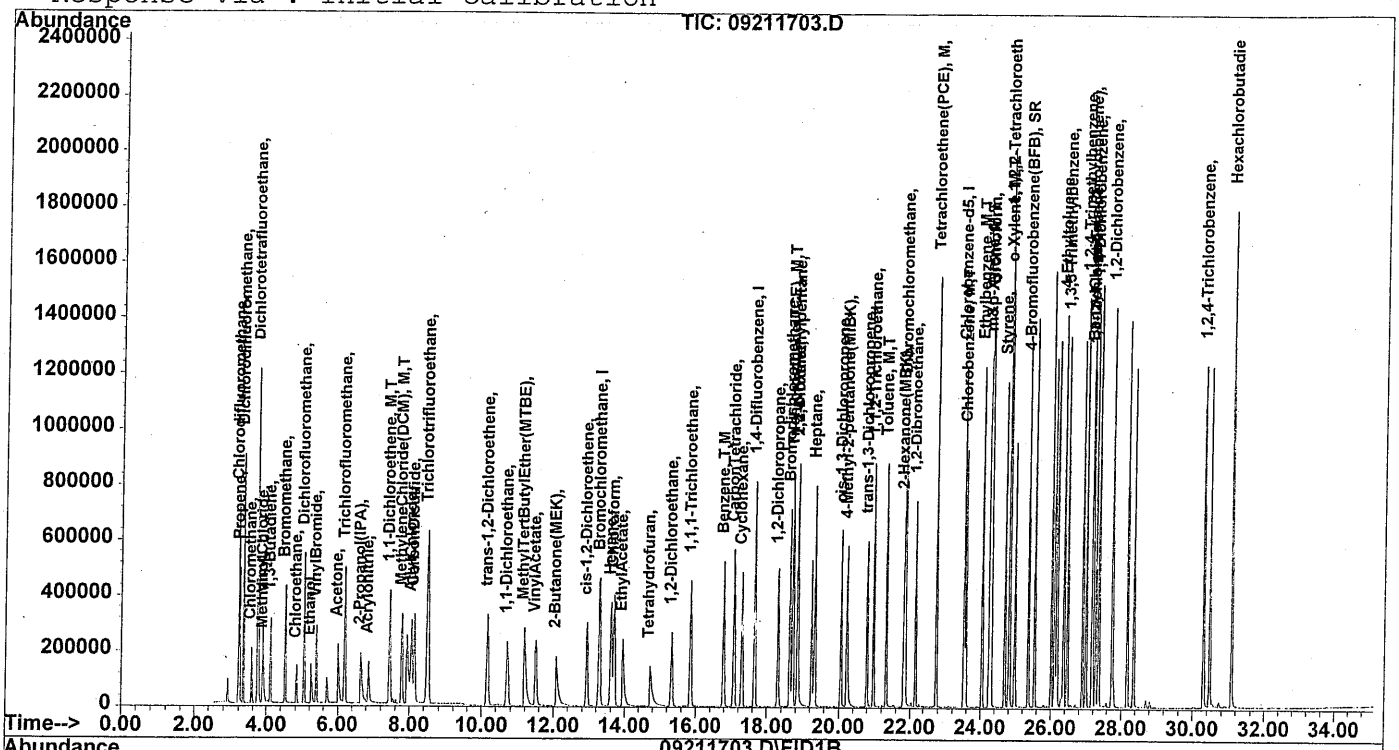
(#) = qualifier out of range (m) = manual integration
09211703.D 082917.M Thu Sep 21 11:08:45 2017

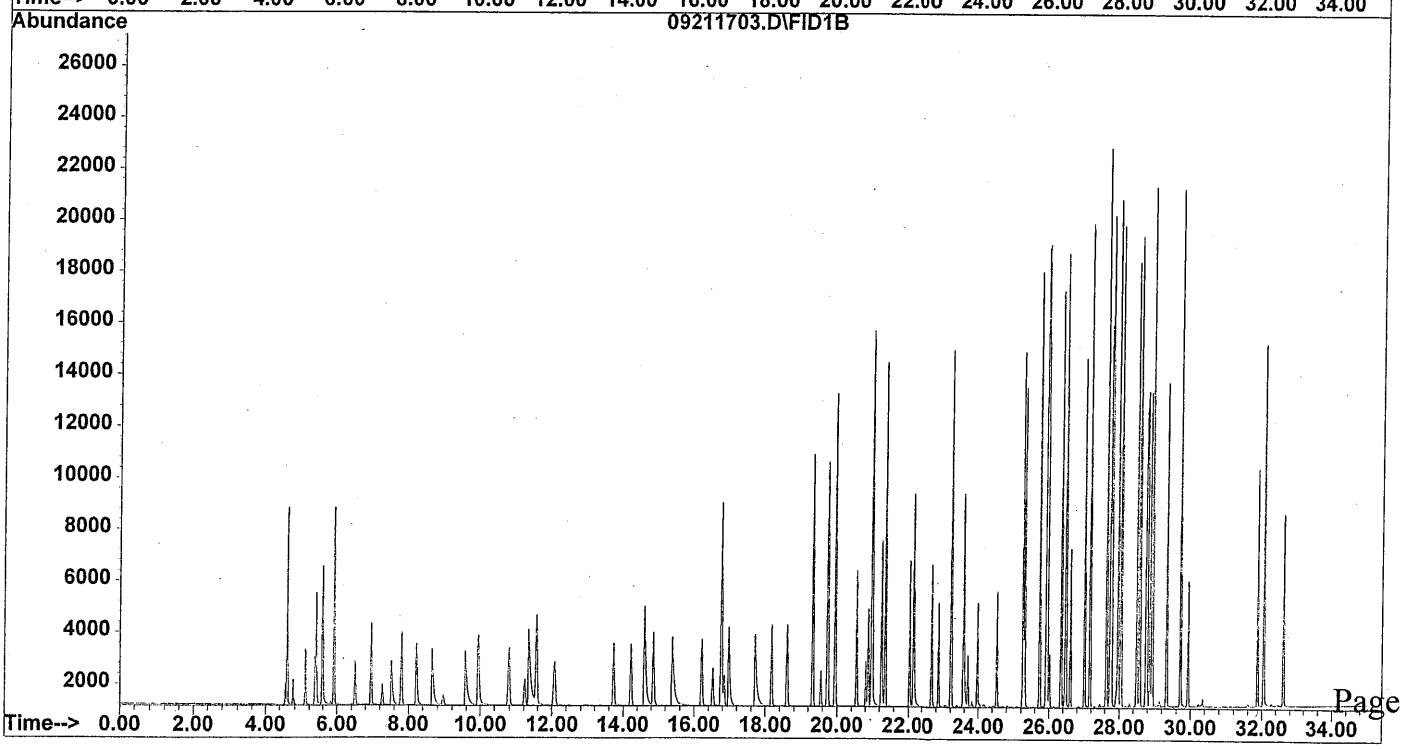
9/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211703.D Vial: 41
Acq On : 21 Sep 2017 10:31 Operator: JJG
Sample : TO15 CCV 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:08 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 62

09211703.D 082917.M Thu Sep 21 11:08:46 2017 Page 3

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211704.D Vial: 41
Acq On : 21 Sep 2017 11:16 Operator: JJG
Sample : TO15 LCSD 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:53 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.31	130	282598m	10.00 ppbv	-0.03
36) 1,4-Difluorobenzene	17.68	114	944030	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.54	117	767774	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	549476	10.85 ppbv	0.00
Spiked Amount 10.000			Recovery	= 108.50%	

Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	508385	11.14 ppbv	
3) Propene	3.23	41	180121	12.01 ppbv	
4) Dichlorodifluoromethane	3.33	85	684797	12.06 ppbv	
5) Chloromethane	3.56	52	62759	11.15 ppbv	
6) Dichlorotetrafluoroethane	3.75	135	367372	10.67 ppbv	
7) VinylChloride	3.90	62	196807	10.89 ppbv	
8) Methanol	3.92	31	146919m	19.46 ppbv	
9) 1,3-Butadiene	4.13	54	121562	10.49 ppbv	
10) Bromomethane	4.52	96	224031	11.16 ppbv	
11) Chloroethane	4.83	64	85933	10.10 ppbv	
12) Dichlorofluoromethane	5.04	67	459465	10.82 ppbv	
13) Ethanol	5.24	31	170549	9.12 ppbv	
14) VinylBromide	5.40	108	223856	11.91 ppbv	
15) Acetone	6.01	43	328803	10.32 ppbv	
16) Trichlorofluoromethane	6.20	103	322085	10.97 ppbv	
17) 2-Propanol(IPA)	6.65	45	461614	13.20 ppbv	
18) Acrylonitrile	6.88	52	149464	12.97 ppbv #	
19) 1,1-Dichloroethene	7.48	96	233250	13.45 ppbv	
20) MethyleneChloride(DCM)	7.81	84	222309	13.00 ppbv	
21) AllylChloride	8.08	39	204272m	11.29 ppbv	
22) CarbonDisulfide	8.17	76	666968	11.23 ppbv	
23) Trichlorotrifluoroethane	8.53	103	370014	12.75 ppbv	
24) trans-1,2-Dichloroethene	10.21	96	235640	11.68 ppbv	
25) 1,1-Dichloroethane	10.74	63	430630	11.71 ppbv #	
26) MethylTertButylEther(MTBE)	11.21	73	567971m	11.78 ppbv	
27) VinylAcetate	11.54	43	695863	11.52 ppbv #	
28) 2-Butanone(MEK)	12.10	43	544238m	11.04 ppbv	
29) cis-1,2-Dichloroethene	12.97	96	255304	11.88 ppbv	
30) Hexane	13.64	41	277011	11.30 ppbv	
31) Chloroform	13.71	83	511278	11.81 ppbv	
32) EthylAcetate	13.95	43	624444	11.43 ppbv	

Page 63

(#) = qualifier out of range (m) = manual integration
09211704.D 082917.M Thu Sep 21 11:59:53 2017

Page 1

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211704.D Vial: 41
Acq On : 21 Sep 2017 11:16 Operator: JJG
Sample : TO15 LCSD 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:53 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.75	42	242786	10.15 ppbv	
34) 1,2-Dichloroethane	15.34	62	316049	11.13 ppbv	
35) 1,1,1-Trichloroethane	15.87	97	440698	11.14 ppbv	
37) Benzene	16.82	78	628433	10.93 ppbv	98
38) CarbonTetrachloride	17.10	117	498024	11.06 ppbv	98
39) Cyclohexane	17.32	84	256635	11.12 ppbv	97
40) 1,2-Dichloropropane	18.31	63	262687	10.55 ppbv	96
41) Bromodichloromethane	18.66	85	357356	10.99 ppbv	96
42) 1,4-Dioxane	18.86	88	155065	9.78 ppbv	
43) Trichloroethene(TCE)	18.73	130	330462	10.02 ppbv	97
44) 2,2,4-Trimethylpentane	18.86	57	961901	10.25 ppbv	98
45) Heptane	19.35	71	165924	10.38 ppbv	97
46) cis-1,3-Dichloropropene	20.06	75	410187	11.23 ppbv	98
47) 4-Methyl-2-pentanone(MiBK)	20.22	58	203168	8.67 ppbv	
48) trans-1,3-Dichloropropene	20.80	75	364081	10.13 ppbv	99
49) 1,1,2-Trichloroethane	20.99	97	343264	11.85 ppbv	93
50) Toluene	21.35	91	798510	11.66 ppbv	99
51) 2-Hexanone(MBK)	21.81	58	308989	10.60 ppbv	94
52) Dibromochloromethane	21.85	129	684935	10.24 ppbv	99
53) 1,2-Dibromoethane	22.15	107	615136	11.14 ppbv	98
54) Tetrachloroethene(PCE)	22.77	166	470730	10.77 ppbv	95
56) Chlorobenzene	23.58	114	229218	11.35 ppbv	92
57) Ethylbenzene	24.06	91	1079005	11.96 ppbv	97
58) m&p-Xylene	24.26	106	740108	22.22 ppbv	93
59) Bromoform	24.31	173	728794	11.51 ppbv #	88
60) Styrene	24.69	104	574473	10.59 ppbv	93
61) 1,1,2,2-Tetrachloroethane	24.81	83	692681	11.03 ppbv	100
62) o-Xylene	24.82	91	749293	10.89 ppbv	99
64) 4-Ethyltoluene	26.38	105	1078634	10.51 ppbv	100
65) 1,3,5-Trimethylbenzene	26.47	105	849663	10.42 ppbv	98
66) 1,2,4-Trimethylbenzene	27.00	105	782456	9.65 ppbv	96
67) BenzylChloride(a-Chlorotol	27.16	91	743679	10.13 ppbv	96
68) 1,3-Dichlorobenzene	27.19	146	709589	10.28 ppbv	98
69) 1,4-Dichlorobenzene	27.28	146	714008	10.24 ppbv	98
70) 1,2-Dichlorobenzene	27.74	146	685395	10.20 ppbv #	96
71) 1,2,4-Trichlorobenzene	30.31	180	578841	9.37 ppbv	99
72) Hexachlorobutadiene	31.08	225	511508	9.88 ppbv	97

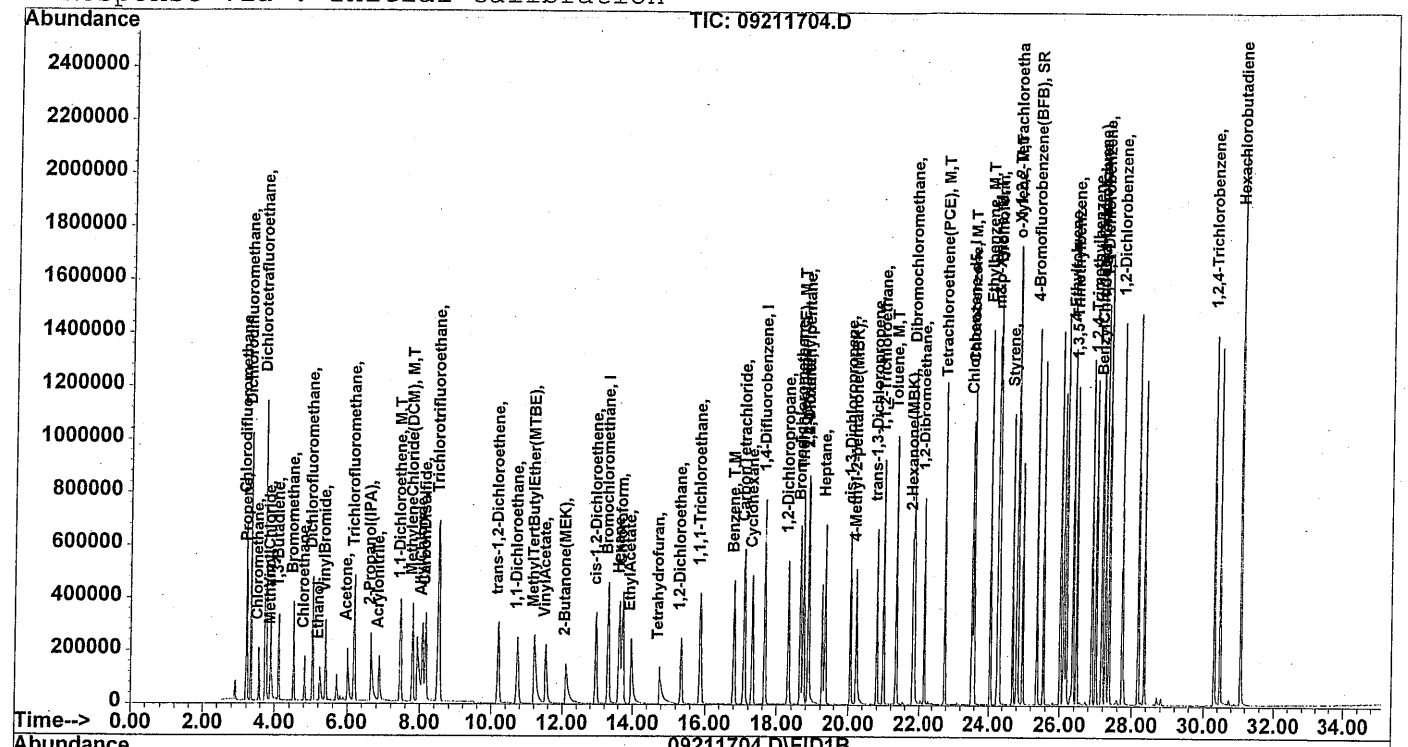
(#) = qualifier out of range (m) = manual integration
09211704.D 082917.M Thu Sep 21 11:59:53 2017

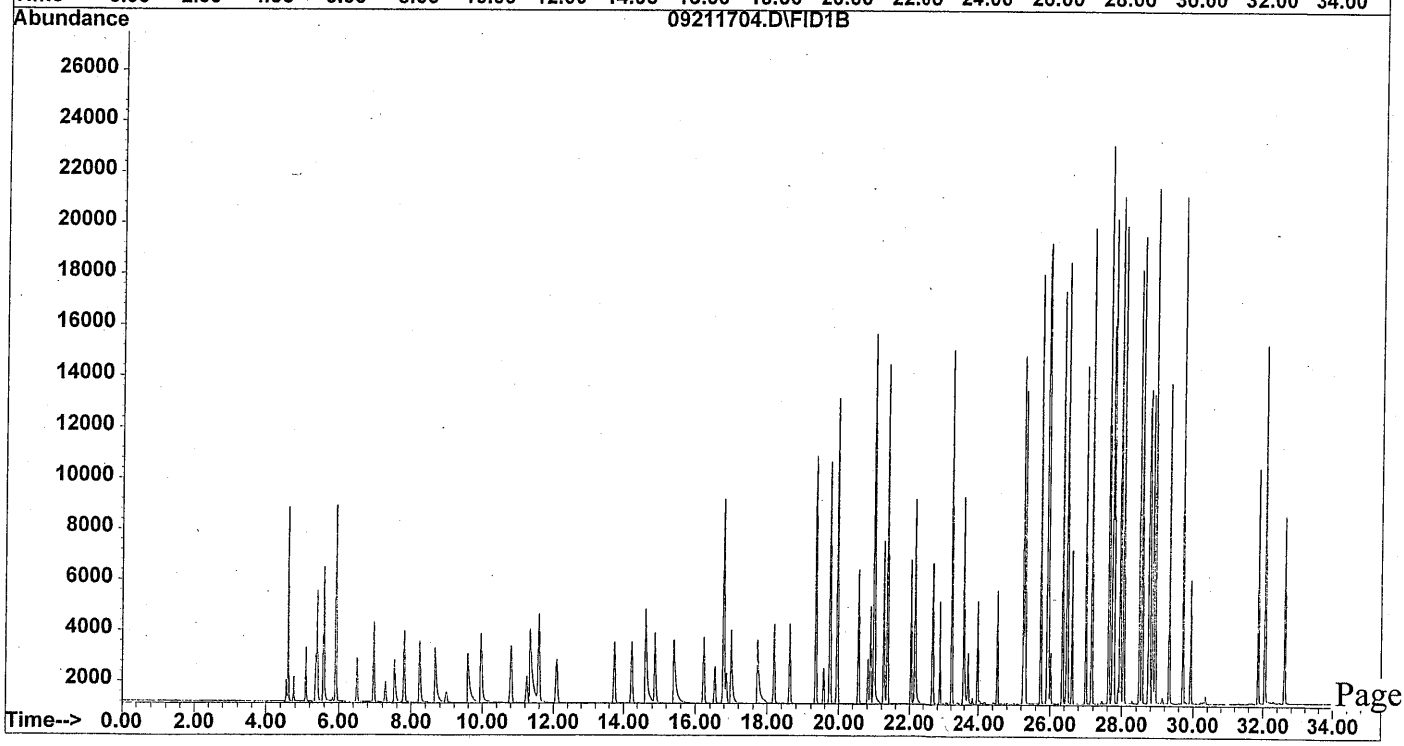
9/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211704.D Vial: 41
Acq On : 21 Sep 2017 11:16 Operator: JJG
Sample : TO15 LCSD 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 11:53 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 65

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211705.D Vial: 1
Acq On : 21 Sep 2017 12:02 Operator: JJG
Sample : TO15 MB 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 12:39 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.34	130	312409m	10.00 ppbv	0.00
36) 1,4-Difluorobenzene	17.68	114	934416	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.54	117	759598	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	520491	10.39 ppbv	0.00
Spiked Amount 10.000			Recovery = 103.90%		

Target Compounds					Qvalue
2) Chlorodifluoromethane	3.23	51	939	N.D.	
3) Propene	3.26	41	866	N.D.	
4) Dichlorodifluoromethane	3.36	85	1341	N.D.	
5) Chloromethane	3.60	52	104	N.D.	
6) Dichlorotetrafluoroethane	3.78	135	720	N.D.	
7) VinylChloride	3.93	62	478	N.D.	
8) Methanol	3.83	31	152	N.D.	
9) 1,3-Butadiene	4.17	54	413	N.D.	
10) Bromomethane	4.56	96	808	N.D.	
11) Chloroethane	4.87	64	207	N.D.	
12) Dichlorofluoromethane	5.09	67	1222	N.D.	
13) Ethanol	5.23	31	121	N.D.	
14) VinylBromide	5.45	108	259	N.D.	
15) Acetone	6.01	43	106	N.D.	
16) Trichlorofluoromethane	6.23	103	1024	N.D.	
17) 2-Propanol(IPA)	0.00	45	0	N.D.	
18) Acrylonitrile	6.89	52	104	N.D.	
19) 1,1-Dichloroethene	7.51	96	559	N.D.	
20) MethyleneChloride(DCM)	7.84	84	2314	N.D.	
21) AllylChloride	8.14	39	1251	N.D.	
22) CarbonDisulfide	8.20	76	2645	N.D.	
23) Trichlorotrifluoroethane	8.56	103	827	N.D.	
24) trans-1,2-Dichloroethene	10.24	96	105	N.D.	
25) 1,1-Dichloroethane	10.80	63	1144	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.51	43	107	N.D.	
28) 2-Butanone(MEK)	12.01	43	105	N.D.	
29) cis-1,2-Dichloroethene	13.00	96	477	N.D.	
30) Hexane	13.68	41	537	N.D.	
31) Chloroform	13.73	83	1162	N.D.	
32) EthylAcetate	13.92	43	93	N.D.	

Page 66

(#) = qualifier out of range (m) = manual integration
09211705.D 082917.M Thu Sep 21 12:40:21 2017

Page 1

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211705.D Vial: 1
Acq On : 21 Sep 2017 12:02 Operator: JJG
Sample : TO15 MB 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 12:39 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.87	42	118	N.D.	
34) 1,2-Dichloroethane	15.40	62	655	N.D.	
35) 1,1,1-Trichloroethane	15.92	97	913	N.D.	
37) Benzene	16.84	78	1499	N.D.	
38) CarbonTetrachloride	17.10	117	791	N.D.	
39) Cyclohexane	17.32	84	510	N.D.	
40) 1,2-Dichloropropane	18.36	63	663	N.D.	
41) Bromodichloromethane	18.67	85	851	N.D.	
42) 1,4-Dioxane	18.85	88	91	N.D.	
43) Trichloroethene(TCE)	18.74	130	996	N.D.	
44) 2,2,4-Trimethylpentane	18.88	57	1963	N.D.	
45) Heptane	19.35	71	310	N.D.	
46) cis-1,3-Dichloropropene	20.08	75	688	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	20.82	75	686	N.D.	
49) 1,1,2-Trichloroethane	21.01	97	794	N.D.	
50) Toluene	21.36	91	1807	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	21.87	129	1450	N.D.	
53) 1,2-Dibromoethane	22.16	107	1487	N.D.	
54) Tetrachloroethene(PCE)	22.77	166	1111	N.D.	
56) Chlorobenzene	23.60	114	747	N.D.	
57) Ethylbenzene	24.06	91	3022	N.D.	
58) m&p-Xylene	24.26	106	2083	N.D.	
59) Bromoform	24.32	173	2573	N.D.	
60) Styrene	24.71	104	2335	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.82	83	3820	N.D.	
62) o-Xylene	24.84	91	2682	N.D.	
64) 4-Ethyltoluene	26.38	105	3054	N.D.	
65) 1,3,5-Trimethylbenzene	26.48	105	3340	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	3613	N.D.	
67) BenzylChloride(a-Chlorotol	27.16	91	1868	N.D.	
68) 1,3-Dichlorobenzene	27.19	146	3062	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	4028	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	4573	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	5435	N.D.	
72) Hexachlorobutadiene	31.08	225	4316	N.D.	

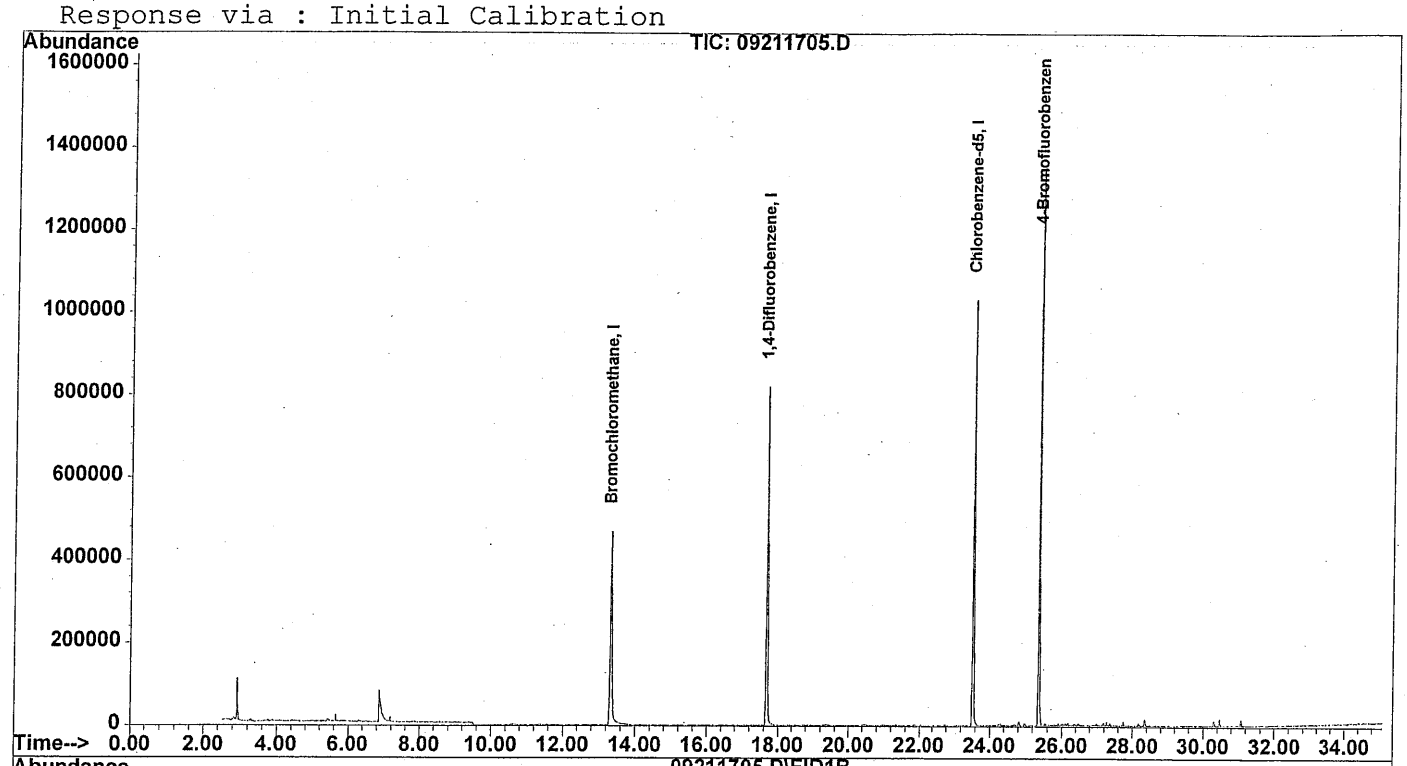
(#) = qualifier out of range (m) = manual integration
09211705.D 082917.M Thu Sep 21 12:40:21 2017

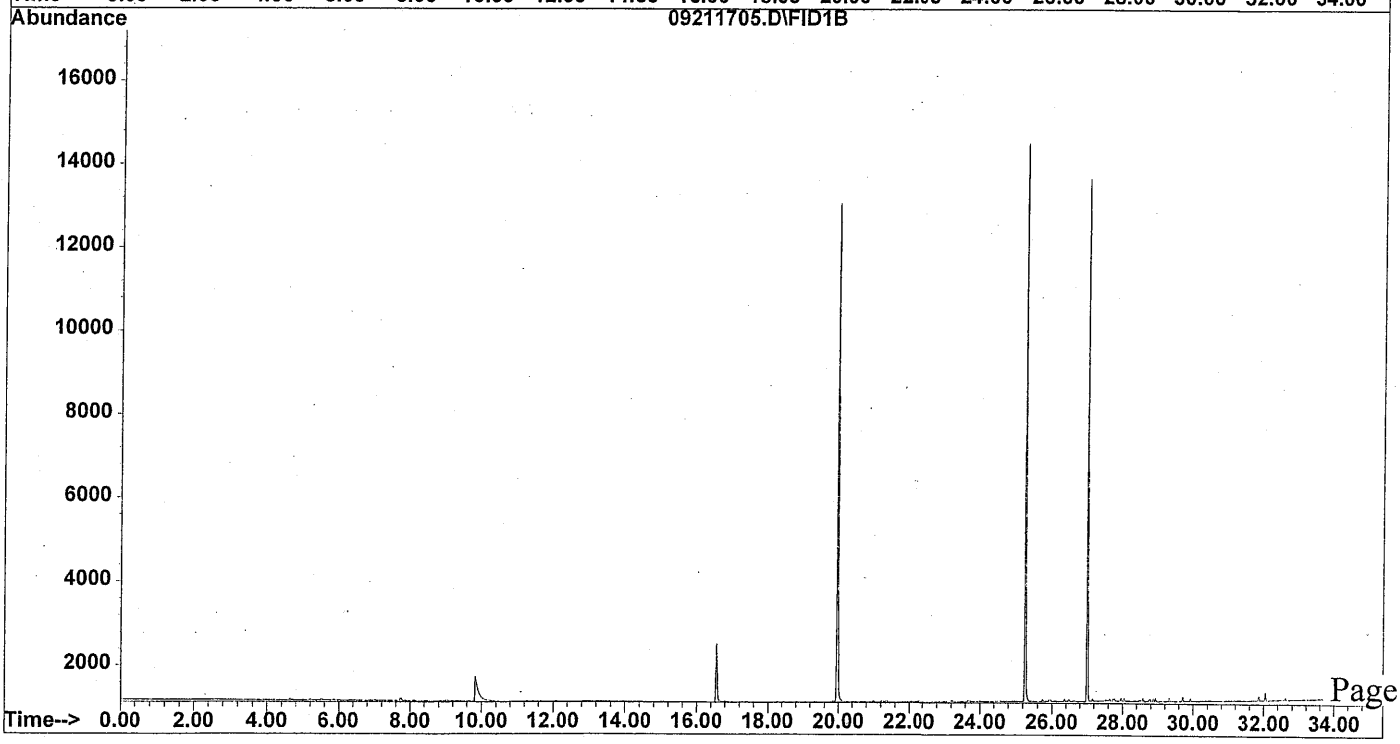
09/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211705.D Vial: 1
Acq On : 21 Sep 2017 12:02 Operator: JJG
Sample : TO15 MB 092117 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 12:39 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 68

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211706.D Vial: 2
Acq On : 21 Sep 2017 12:47 Operator: JJG
Sample : 171435-103225 x1 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.31	130	296360m	10.00 ppbv	-0.03
36) 1,4-Difluorobenzene	17.66	114	974469	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	729241	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	499971	10.39 ppbv	0.00
Spiked Amount 10.000			Recovery	= 103.90%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.21	51	14288	N.D.	
3) Propene	3.24	41	13337m	<0.85 ppbv	
4) Dichlorodifluoromethane	3.35	85	20881	N.D.	
5) Chloromethane	3.59	52	2220	N.D.	
6) Dichlorotetrafluoroethane	3.77	135	1831	N.D.	
7) VinylChloride	3.92	62	665	N.D.	
8) Methanol	3.98	31	53176m	6.72 ppbv	
9) 1,3-Butadiene	4.14	54	400	N.D.	
10) Bromomethane	4.53	96	805	N.D.	
11) Chloroethane	4.85	64	464	N.D.	
12) Dichlorofluoromethane	5.06	67	1713	N.D.	
13) Ethanol	5.36	31	93816m	4.78 ppbv	
14) VinylBromide	5.42	108	695	N.D.	
15) Acetone	6.11	43	221032m	6.61 ppbv	
16) Trichlorofluoromethane	6.20	103	11158	N.D.	
17) 2-Propanol(IPA)	6.86	45	102945m	2.81 ppbv	
18) Acrylonitrile	7.00	52	573	N.D.	
19) 1,1-Dichloroethene	7.48	96	810	N.D.	
20) MethyleneChloride(DCM)	7.82	84	6435	N.D.	
21) AllylChloride	8.09	39	1157	N.D.	
22) CarbonDisulfide	8.17	76	21894	N.D.	
23) Trichlorotrifluoroethane	8.53	103	2747	N.D.	
24) trans-1,2-Dichloroethene	10.21	96	953	N.D.	
25) 1,1-Dichloroethane	10.74	63	1453	N.D.	
26) MethylTertButylEther(MTBE)	11.17	73	328	N.D.	
27) VinylAcetate	11.61	43	7756	N.D.	
28) 2-Butanone(MEK)	12.47	43	31932m	<0.62 ppbv	
29) cis-1,2-Dichloroethene	12.99	96	1026	N.D.	
30) Hexane	13.63	41	7168	N.D.	
31) Chloroform	13.71	83	8620	N.D.	
32) EthylAcetate	14.25	43	7871	N.D.	

Page 69

(#) = qualifier out of range (m) = manual integration
09211706.D 082917.M Thu Sep 21 14:38:02 2017 Page 1

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211706.D Vial: 2
Acq On : 21 Sep 2017 12:47 Operator: JJG
Sample : 171435-103225 x1 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:37 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33)	Tetrahydrofuran	14.69	42	119	N.D.	
34)	1,2-Dichloroethane	15.37	62	1209	N.D.	
35)	1,1,1-Trichloroethane	15.89	97	1805	N.D.	
37)	Benzene	16.81	78	11580	N.D.	
38)	CarbonTetrachloride	17.10	117	4469	N.D.	
39)	Cyclohexane	17.32	84	1398	N.D.	
40)	1,2-Dichloropropane	18.34	63	1116	N.D.	
41)	Bromodichloromethane	18.66	85	1611	N.D.	
42)	1,4-Dioxane	0.00	88	0	N.D.	
43)	Trichloroethene(TCE)	18.73	130	1864	N.D.	
44)	2,2,4-Trimethylpentane	18.86	57	17146	N.D.	
45)	Heptane	19.35	71	2901	N.D.	
46)	cis-1,3-Dichloropropene	20.08	75	1320	N.D.	
47)	4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48)	trans-1,3-Dichloropropene	20.82	75	1352	N.D.	
49)	1,1,2-Trichloroethane	21.01	97	1345	N.D.	
50)	Toluene	21.35	91	102550	1.45 ppbv	94
51)	2-Hexanone(MBK)	21.91	58	2672	N.D.	
52)	Dibromochloromethane	21.85	129	2575	N.D.	
53)	1,2-Dibromoethane	22.16	107	1921	N.D.	
54)	Tetrachloroethene(PCE)	22.77	166	5097	N.D.	
56)	Chlorobenzene	23.58	114	944	N.D.	
57)	Ethylbenzene	24.05	91	11421	N.D.	
58)	m&p-Xylene	24.26	106	9408	N.D.	
59)	Bromoform	24.31	173	2729	N.D.	
60)	Styrene	24.69	104	5288	N.D.	
61)	1,1,2,2-Tetrachloroethane	24.81	83	4157	N.D.	
62)	o-Xylene	24.82	91	8752	N.D.	
64)	4-Ethyltoluene	26.38	105	6774	N.D.	
65)	1,3,5-Trimethylbenzene	26.47	105	5102	N.D.	
66)	1,2,4-Trimethylbenzene	27.00	105	9706	N.D.	
67)	BenzylChloride(a-Chlorotol	27.16	91	2445	N.D.	
68)	1,3-Dichlorobenzene	27.19	146	3308	N.D.	
69)	1,4-Dichlorobenzene	27.19	146	3308	N.D.	
70)	1,2-Dichlorobenzene	27.74	146	4732	N.D.	
71)	1,2,4-Trichlorobenzene	30.31	180	4813	N.D.	
72)	Hexachlorobutadiene	31.08	225	4426	N.D.	

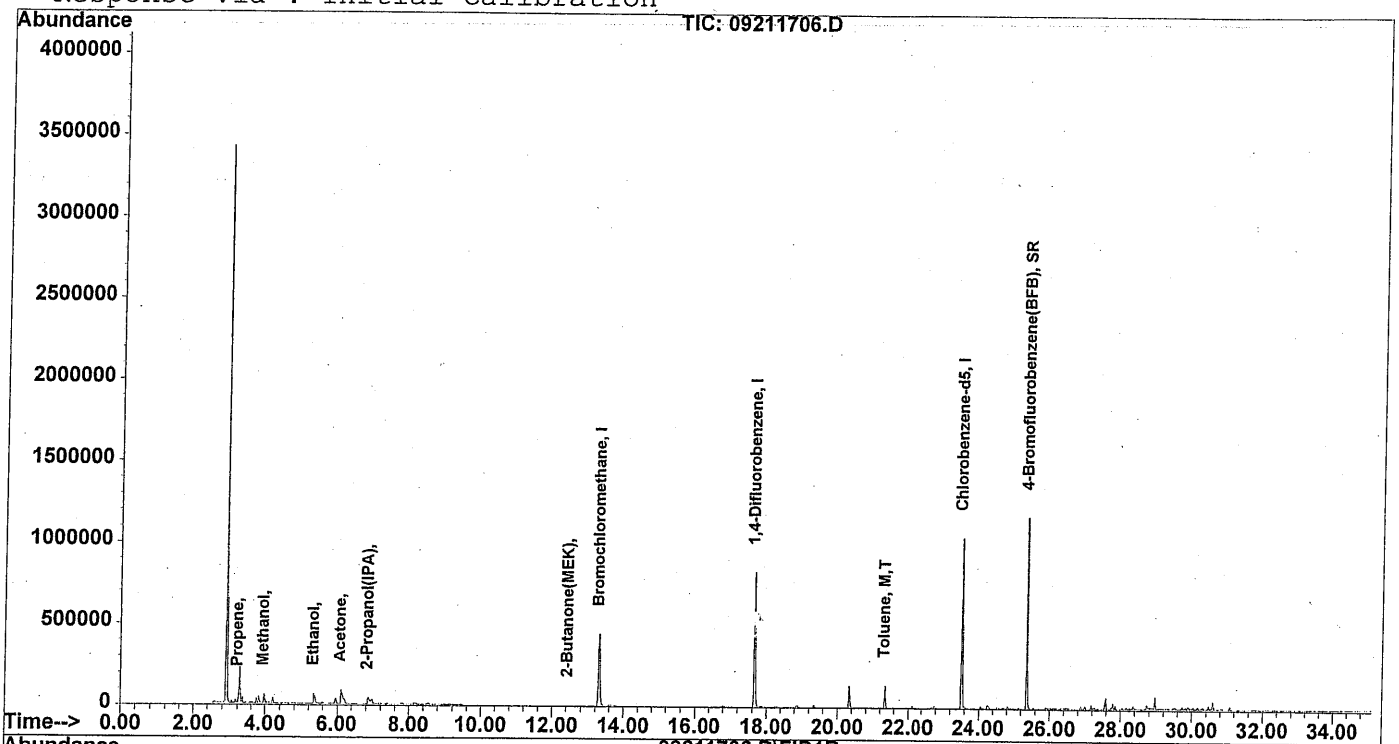
(#) = qualifier out of range (m) = manual integration
09211706.D 082917.M Thu Sep 21 14:38:03 2017

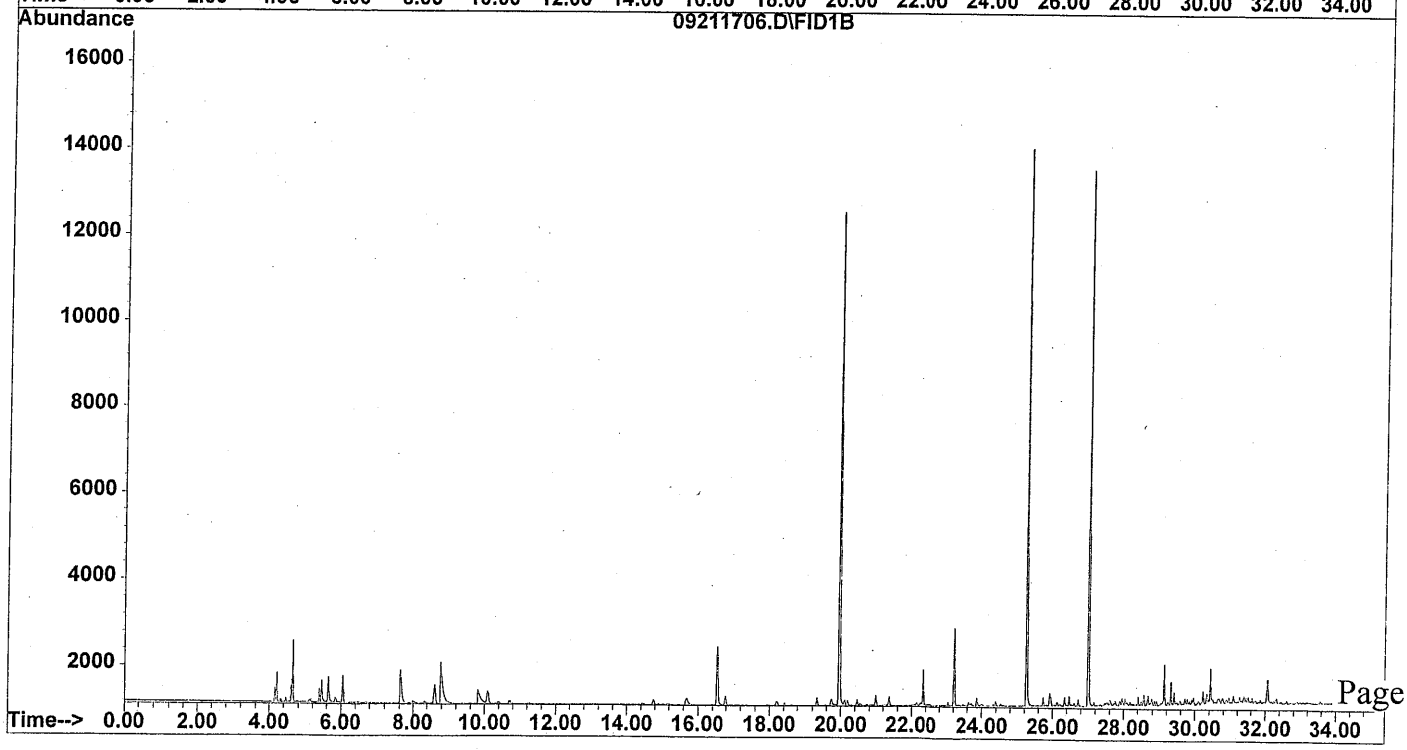
09/21/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211706.D Vial: 2
Acq On : 21 Sep 2017 12:47 Operator: JJG
Sample : 171435-103225 x1 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:37 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 71

09211706.D 082917.M Thu Sep 21 14:38:04 2017 Page 3

09/21/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211707.D Vial: 2
Acq On : 21 Sep 2017 13:32 Operator: JJG
Sample : 171435-103225 x1 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:33 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.33	130	287133	10.00 ppbv	-0.01
36) 1,4-Difluorobenzene	17.68	114	895765	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.54	117	778071	10.00 ppbv	0.00
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	503445	9.81 ppbv	0.00
Spiked Amount 10.000			Recovery	= 98.10%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.21	51	14259	N.D.	
3) Propene	3.24	41	12901m	<0.85 ppbv	
4) Dichlorodifluoromethane	3.35	85	21288	N.D.	
5) Chloromethane	3.57	52	1926	N.D.	
6) Dichlorotetrafluoroethane	3.75	135	921	N.D.	
7) VinylChloride	3.90	62	631	N.D.	
8) Methanol	3.98	31	52379m	6.83 ppbv	
9) 1,3-Butadiene	4.13	54	723	N.D.	
10) Bromomethane	4.53	96	739	N.D.	
11) Chloroethane	4.74	64	92	N.D.	
12) Dichlorofluoromethane	5.06	67	1113	N.D.	
13) Ethanol	5.35	31	90667m	4.77 ppbv	
14) VinylBromide	5.42	108	302	N.D.	
15) Acetone	6.11	43	201950m	6.24 ppbv	
16) Trichlorofluoromethane	6.20	103	9727	N.D.	
17) 2-Propanol(IPA)	6.85	45	93321m	2.63 ppbv	
18) Acrylonitrile	6.97	52	219	N.D.	
19) 1,1-Dichloroethene	7.48	96	841	N.D.	
20) MethyleneChloride(DCM)	7.81	84	5688	N.D.	
21) AllylChloride	8.09	39	1153	N.D.	
22) CarbonDisulfide	8.17	76	19631	N.D.	
23) Trichlorotrifluoroethane	8.54	103	2450	N.D.	
24) trans-1,2-Dichloroethene	10.24	96	455	N.D.	
25) 1,1-Dichloroethane	10.74	63	1267	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.60	43	3216	N.D.	
28) 2-Butanone(MEK)	12.44	43	31100m	<0.62 ppbv	
29) cis-1,2-Dichloroethene	12.99	96	845	N.D.	
30) Hexane	13.65	41	6999	N.D.	
31) Chloroform	13.73	83	9216	N.D.	
32) EthylAcetate	13.95	43	129	N.D.	

Page 72

(#) = qualifier out of range (m) = manual integration
09211707.D 082917.M Thu Sep 21 14:33:49 2017

Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092117\09211707.D Vial: 2
Acq On : 21 Sep 2017 13:32 Operator: JJG
Sample : 171435-103225 x1 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:33 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.69	42	92	N.D.	
34) 1,2-Dichloroethane	15.37	62	1248	N.D.	
35) 1,1,1-Trichloroethane	15.90	97	1507	N.D.	
37) Benzene	16.82	78	12392	N.D.	
38) CarbonTetrachloride	17.12	117	3388	N.D.	
39) Cyclohexane	17.34	84	1933	N.D.	
40) 1,2-Dichloropropane	18.34	63	821	N.D.	
41) Bromodichloromethane	18.67	85	913	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	18.74	130	2093	N.D.	
44) 2,2,4-Trimethylpentane	18.88	57	17944	N.D.	
45) Heptane	19.35	71	2604	N.D.	
46) cis-1,3-Dichloropropene	20.09	75	1122	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	20.33	58	101	N.D.	
48) trans-1,3-Dichloropropene	20.81	75	679	N.D.	
49) 1,1,2-Trichloroethane	21.01	97	853	N.D.	
50) Toluene	21.35	91	94505	1.45 ppbv	99
51) 2-Hexanone(MBK)	21.92	58	1906	N.D.	
52) Dibromochloromethane	21.85	129	1736	N.D.	
53) 1,2-Dibromoethane	22.16	107	1476	N.D.	
54) Tetrachloroethene(PCE)	22.77	166	5116	N.D.	
56) Chlorobenzene	23.58	114	921	N.D.	
57) Ethylbenzene	24.07	91	11581	N.D.	
58) m&p-Xylene	24.26	106	9745	N.D.	
59) Bromoform	24.32	173	1947	N.D.	
60) Styrene	24.71	104	3905	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.81	83	2255	N.D.	
62) o-Xylene	24.82	91	7441	N.D.	
64) 4-Ethyltoluene	26.38	105	4358	N.D.	
65) 1,3,5-Trimethylbenzene	26.47	105	3700	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	8353	N.D.	
67) BenzylChloride(a-Chlorotol	27.18	91	1638	N.D.	
68) 1,3-Dichlorobenzene	27.19	146	1781	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	4023	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	2066	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	2362	N.D.	
72) Hexachlorobutadiene	31.08	225	2167	N.D.	

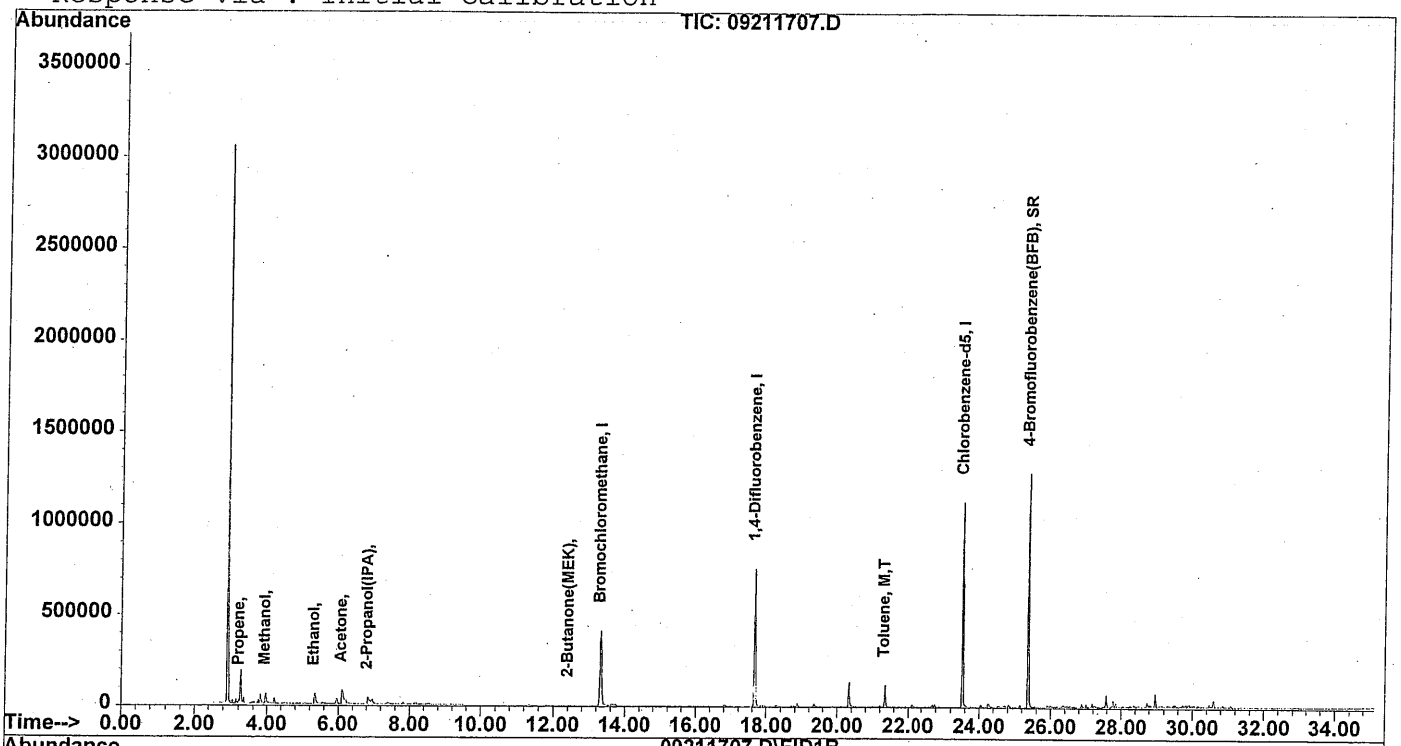
(#) = qualifier out of range (m) = manual integration
09211707.D 082917.M Thu Sep 21 14:33:50 2017

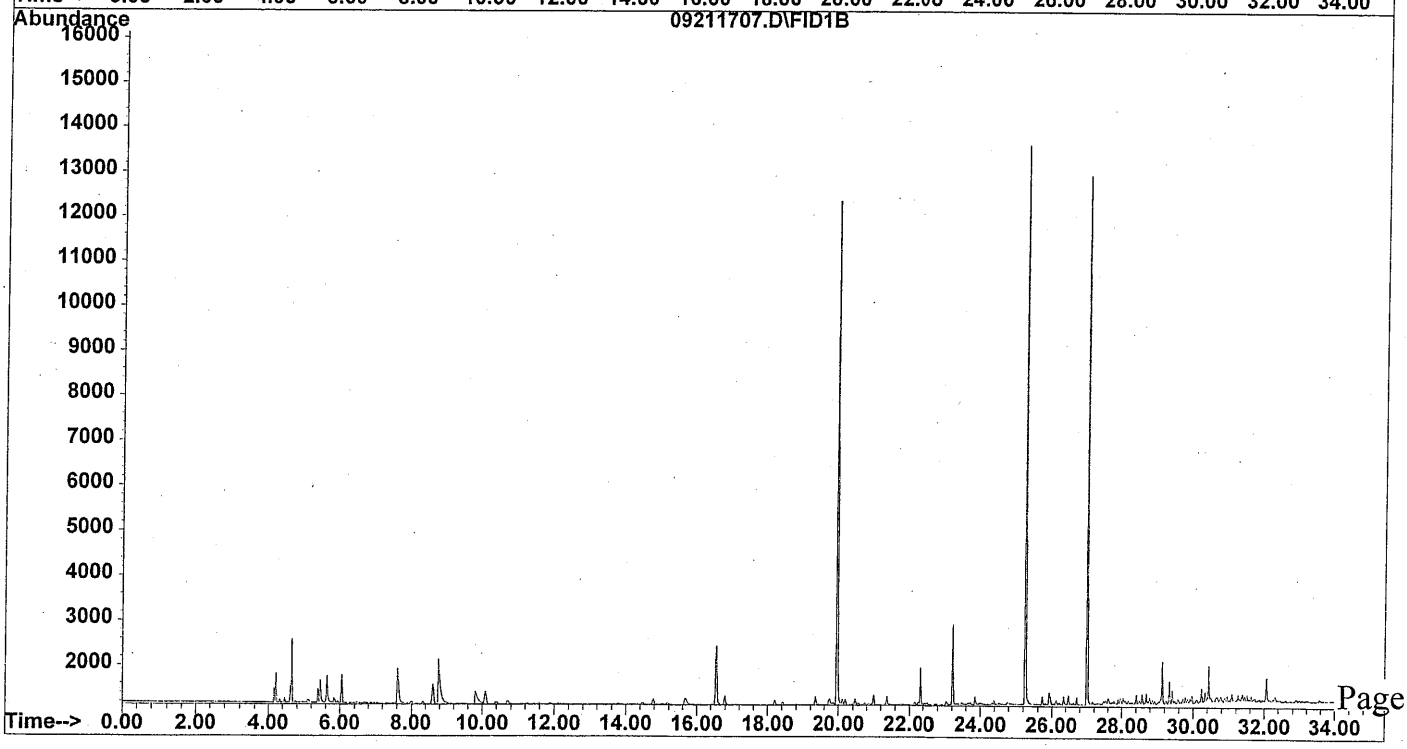
9/28/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092117\09211707.D Vial: 2
Acq On : 21 Sep 2017 13:32 Operator: JJG
Sample : 171435-103225 x1 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 21 14:33 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





09211707.D 082917.M Thu Sep 21 14:33:52 2017 Page 3

9/21/17

Calibration Status Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.5	1	10	C:\HPCHEM\1\MS02\2017\082917\08291710.D
2	1.0	1	10	C:\HPCHEM\1\MS02\2017\082917\08291709.D
3	2.0	2	10	C:\HPCHEM\1\MS02\2017\082917\08291708.D
4	5.0	5	10	C:\HPCHEM\1\MS02\2017\082917\08291707.D
5	10	10	10	C:\HPCHEM\1\MS02\2017\082917\08291706.D
6	20	21	10	C:\HPCHEM\1\MS02\2017\082917\08291705.D
7	50	52	10	C:\HPCHEM\1\MS02\2017\082917\08291704.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.5	Aug 29 21:04 2017	Aug 29 17:22 19117	29 Aug 2017 15:22
2	1.0	Aug 29 21:04 2017	Aug 29 17:02 19117	29 Aug 2017 14:38
3	2.0	Aug 29 21:04 2017	Aug 29 16:46 19117	29 Aug 2017 13:53
4	5.0	Aug 29 21:03 2017	Aug 29 14:18 19117	29 Aug 2017 13:08
5	10	Aug 29 21:03 2017	Aug 29 14:15 19117	29 Aug 2017 12:24
6	20	Aug 29 21:03 2017	Aug 29 14:12 19117	29 Aug 2017 11:39
7	50	Aug 29 21:03 2017	Aug 29 11:36 19117	29 Aug 2017 10:56

082917.M Tue Aug 29 21:13:23 2017

08/29/17

Response Factor Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

Calibration Files
0.5 =08291710.D 1.0 =08291709.D 2.0 =08291708.D
5.0 =08291707.D 10 =08291706.D 20 =08291705.D

		Compound	0.5	1.0	2.0	5.0	10	20	Avg	%RSD
1)	I	Bromochloromethane	----------ISTD----------							
2)		Chlorodifluorometha	1.585	1.806	1.603	1.585	1.656	1.686	1.614	8.01
3)		Propene	0.492	0.603	0.486	0.547	0.575	0.563	0.531	10.61
4)		Dichlorodifluoromet	2.023	2.359	1.961	2.094	2.059	1.998	2.009	11.63
5)		Chloromethane	0.195	0.233	0.182	0.187	0.196	0.222	0.199	10.21
6)		Dichlorotetrafluoro	1.158	1.484	1.237	1.203	1.209	1.234	1.219	11.61
7)		VinylChloride	0.568	0.738	0.683	0.610	0.660	0.651	0.640	9.77
8)		Methanol	0.278	0.287	0.257	0.258	0.279	0.272	0.267	6.24
9)		1,3-Butadiene	0.419	0.445	0.405	0.386	0.416	0.423	0.410	5.69
10)		Bromomethane	0.661	0.807	0.693	0.725	0.735	0.725	0.710	8.22
11)		Chloroethane	0.301	0.343	0.310	0.275	0.303	0.301	0.301	7.81
12)		Dichlorofluorometha	1.469	1.652	1.462	1.521	1.562	1.488	1.502	6.04
13)		Ethanol	0.720	0.731	0.620	0.652	0.646	0.666	0.662	7.40
14)		VinylBromide	0.686	0.694	0.629	0.642	0.675	0.702	0.665	4.76
15)		Acetone	1.207	1.222	0.979	1.157	1.041	1.124	1.128	7.86
16)		Trichlorofluorometh	1.007	1.163	1.003	1.029	1.004	0.998	1.039	5.78
17)		2-Propanol(IPA)	1.343	1.267	1.095	1.132	1.192	1.370	1.237	8.32
18)		Acrylonitrile	0.360	0.436	0.383	0.372	0.401	0.471	0.408	9.79
19)	M,T	1,1-Dichloroethene	0.606	0.607	0.543	0.546	0.710	0.676	0.614	10.05
20)	M,T	MethyleneChloride(D	0.571	0.658	0.504	0.674	0.622	0.638	0.605	9.94
21)		AllylChloride	0.567	0.665	0.617	0.644	0.646	0.692	0.640	6.15
22)		CarbonDisulfide	1.946	1.987	2.103	2.249	2.159	2.169	2.101	5.03
23)		Trichlorotrifluoroe	1.035	1.070	1.007	1.098	1.049	1.057	1.027	7.31
24)		trans-1,2-Dichloroe	0.670	0.756	0.631	0.756	0.763	0.761	0.714	8.00
25)		1,1-Dichloroethane	1.288	1.290	1.315	1.319	1.300	1.385	1.301	4.03
26)		MethylTertButylEthe	1.574	1.663	1.697	1.719	1.857	1.829	1.705	6.29
27)		VinylAcetate	2.081	2.128	2.154	2.197	2.292	2.179	2.137	5.32
28)		2-Butanone(MEK)	1.866	1.788	1.654	1.798	1.747	1.760	1.745	5.14
29)		cis-1,2-Dichloroeth	0.753	0.809	0.767	0.758	0.776	0.753	0.761	3.96
30)		Hexane	0.938	0.940	0.858	0.859	0.866	0.849	0.868	6.94
31)		Chloroform	1.467	1.749	1.508	1.613	1.534	1.531	1.532	8.58
32)		EthylAcetate	1.971	1.948	1.975	1.932	2.010	1.958	1.933	4.60
33)		Tetrahydrofuran	0.943	0.987	0.773	0.824	0.843	0.799	0.846	10.33
34)		1,2-Dichloroethane	0.931	1.131	0.953	1.024	1.032	1.036	1.005	7.27
35)		1,1,1-Trichloroetha	1.415	1.478	1.379	1.357	1.482	1.405	1.400	4.88
36)	I	1,4-Difluorobenzene	----------ISTD----------							
37)	T,M	Benzene	0.572	0.646	0.641	0.666	0.586	0.614	0.609	7.51
38)		CarbonTetrachloride	0.458	0.511	0.512	0.496	0.485	0.477	0.477	8.17
39)		Cyclohexane	0.217	0.283	0.256	0.258	0.254	0.233	0.244	10.70
40)		1,2-Dichloropropane	0.259	0.268	0.287	0.276	0.282	0.258	0.264	8.78
41)		Bromodichloromethan	0.338	0.387	0.367	0.341	0.349	0.347	0.344	9.42
42)		1,4-Dioxane	0.174	0.188	0.179	0.166	0.165	0.159	0.168	8.43

(#) = Out of Range ### Number of calibration levels exceeded format ###
082917.M Tue Aug 29 21:13:40 2017

8/29/17

Response Factor Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

Calibration Files
0.5 =08291710.D 1.0 =08291709.D 2.0 =08291708.D
5.0 =08291707.D 10 =08291706.D 20 =08291705.D

		Compound	0.5	1.0	2.0	5.0	10	20	Avg	%RSD
43)	M,T	Trichloroethene(TCE	0.357	0.365	0.394	0.368	0.354	0.337	0.349	10.99
44)		2,2,4-Trimethylpent	1.026	1.067	0.986	1.086	1.030	0.959	0.994	9.49
45)		Heptane	0.158	0.187	0.199	0.170	0.165	0.166	0.169	11.38
46)		cis-1,3-Dichloropro	0.377	0.405	0.427	0.401	0.375	0.396	0.387	8.27
47)		4-Methyl-2-pentanon	0.255	0.254	0.264	0.264	0.248	0.238	0.248	6.95
48)		trans-1,3-Dichlorop	0.368	0.392	0.405	0.376	0.405	0.388	0.381	6.72
49)		1,1,2-Trichloroetha	0.303	0.332	0.344	0.341	0.318	0.279	0.307	13.22
50)	M,T	Toluene	0.690	0.750	0.785	0.836	0.755	0.682	0.725	11.55
51)		2-Hexanone(MBK)	0.296	0.356	0.343	0.327	0.293	0.301	0.309	11.87
52)		Dibromochloromethan	0.662	0.785	0.796	0.794	0.685	0.698	0.709	13.15
53)		1,2-Dibromoethane	0.599	0.639	0.624	0.609	0.614	0.565	0.585	11.38
54)	M,T	Tetrachloroethene(P	0.454	0.476	0.522	0.541	0.489	0.445	0.463	16.07
55)	I	Chlorobenzene-d5	----------ISTD----------							
56)	M,T	Chlorobenzene	0.263	0.297	0.272	0.289	0.251	0.253	0.263	10.21
57)	M,T	Ethylbenzene	1.185	1.414	1.248	1.197	1.125	1.110	1.175	12.10
58)	M,T	m&p-Xylene	0.448	0.588	0.476	0.418	0.417	0.395	0.434	20.44
59)		Bromoform	0.829	1.059	0.928	0.827	0.815	0.761	0.824	18.84
60)		Styrene	0.689	0.807	0.756	0.735	0.705	0.645	0.706	9.57
61)		1,1,2,2-Tetrachloro	0.888	1.061	0.894	0.842	0.787	0.693	0.818	19.48
62)	M,T	o-Xylene	0.985	1.137	0.992	0.902	0.836	0.786	0.897	18.04
63)	SR	4-Bromofluorobenzen	0.664	0.731	0.611	0.632	0.676	0.611	0.660	6.74
64)		4-Ethyltoluene	1.417	1.643	1.399	1.416	1.310	1.213	1.337	15.73
65)		1,3,5-Trimethylbenz	1.079	1.283	1.090	1.144	1.044	1.029	1.062	14.79
66)		1,2,4-Trimethylbenz	1.093	1.268	1.052	1.173	1.059	0.947	1.056	14.32
67)		BenzylChloride(a-Ch	1.012	1.178	1.023	1.003	0.915	0.842	0.956	15.32
68)		1,3-Dichlorobenzene	0.918	1.128	0.999	0.944	0.875	0.796	0.899	17.48
69)		1,4-Dichlorobenzene	0.931	1.050	1.009	0.919	0.886	0.859	0.908	12.39
70)		1,2-Dichlorobenzene	0.935	1.016	0.943	0.846	0.891	0.791	0.875	11.97
71)		1,2,4-Trichlorobenz	0.751	0.879	0.884	0.867	0.862	0.770	0.804	12.32
72)		Hexachlorobutadiene	0.686	0.779	0.748	0.756	0.702	0.618	0.674	17.86

(#) = Out of Range ### Number of calibration levels exceeded format ###
082917.M Tue Aug 29 21:13:42 2017

8/29/17

Standard
CERTIFICATION

THE LINDE GROUP

SHIPPED TO: Atmospheric Analysis
1534 Eastman Ave. Suite A
Ventura, CA 93003

PAGE: 1 of 3

SS0996

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Propylene	115-07-1	1.00 ppm	1.09 ppm
Freon-12	75-71-8	1.00 ppm	1.06 ppm
Chloromethane	74-87-3	1.00 ppm	1.03 ppm
Freon-114	76-14-2	1.00 ppm	1.00 ppm
Vinyl Chloride	75-01-4	1.00 ppm	1.01 ppm
1,3-Butadiene	106-99-0	1.00 ppm	1.05 ppm
Bromomethane	74-83-9	1.00 ppm	1.00 ppm
Chloroethane	75-00-3	1.00 ppm	0.97 ppm
Ethanol (Analytical Accuracy ± 10%)	64-17-5	1.00 ppm	0.91 ppm
Acrolein (Analytical Accuracy ± 10%)	107-02-8	1.00 ppm	1.01 ppm
Acetone	67-64-1	1.00 ppm	1.06 ppm
Freon-11	75-69-4	1.00 ppm	1.04 ppm
Isopropyl Alcohol	67-63-0	1.00 ppm	1.08 ppm
1,1-Dichloroethene	75-35-4	1.00 ppm	1.08 ppm
Carbon Disulfide (Analytical Accuracy ± 10%)	75-15-0	1.00 ppm	1.00 ppm
Methylene Chloride	75-09-2	1.00 ppm	1.05 ppm
Freon-113	76-13-1	1.00 ppm	1.07 ppm
Trans-1,2-Dichloroethene	156-60-5	1.00 ppm	1.01 ppm
1,1-Dichloroethane	75-34-3	1.00 ppm	1.05 ppm
Methyl Tert Butyl Ether	1634-04-4	1.00 ppm	1.06 ppm
Vinyl Acetate	108-05-4	1.00 ppm	1.08 ppm
Methyl Ethyl Ketone	78-93-3	1.00 ppm	1.06 ppm
Cis-1,2-Dichloroethene	156-59-2	1.00 ppm	1.06 ppm
Hexane	110-54-3	1.00 ppm	1.05 ppm
Chloroform	67-66-3	1.00 ppm	1.09 ppm
Ethyl Acetate	141-78-6	1.00 ppm	1.09 ppm
Tetrahydrofuran	109-99-9	1.00 ppm	1.05 ppm
1,2-Dichloroethane	107-06-2	1.00 ppm	1.06 ppm
1,1,1-Trichloroethane	71-55-6	1.00 ppm	1.06 ppm
Benzene	71-43-2	1.00 ppm	1.04 ppm

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Ventura, CA 93003

PAGE: 2 of 3

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Carbon Tetrachloride	56-23-5	1.00 ppm	1.08 ppm
Cyclohexane	110-82-7	1.00 ppm	1.05 ppm
1,2-Dichloropropane	78-87-5	1.00 ppm	1.05 ppm
Trichloroethylene	79-01-6	1.00 ppm	1.04 ppm
Bromodichloromethane	75-27-4	1.00 ppm	1.04 ppm
1,4-Dioxane	123-91-1	1.00 ppm	1.04 ppm
Methyl Methacrylate	80-62-6	1.00 ppm	1.04 ppm
Heptane	142-82-5	1.00 ppm	1.04 ppm
Cis-1,3-Dichloropropene	10061-01-5	1.00 ppm	1.07 ppm
Methyl Isobutyl Ketone	108-10-1	1.00 ppm	1.00 ppm
Trans-1,3-Dichloropropene	10061-02-6	1.00 ppm	1.00 ppm
1,1,2-Trichloroethane	79-00-5	1.00 ppm	1.04 ppm
Toluene	108-88-3	1.00 ppm	1.06 ppm
Methyl Butyl Ketone	591-78-6	1.00 ppm	1.08 ppm
Dibromochloromethane	124-48-1	1.00 ppm	0.99 ppm
1,2-Dibromoethane	106-93-4	1.00 ppm	1.04 ppm
Tetrachloroethylene	127-18-4	1.00 ppm	1.03 ppm
Chlorobenzene	108-90-7	1.00 ppm	1.05 ppm
Ethylbenzene	100-41-4	1.00 ppm	1.05 ppm
p-xylene	106-42-3	1.00 ppm	1.00 ppm
m-xylene	108-38-3	1.00 ppm	1.00 ppm
Bromoform	75-25-2	1.00 ppm	1.04 ppm
Styrene	100-42-5	1.00 ppm	1.03 ppm
o-xylene	95-47-6	1.00 ppm	1.04 ppm
1,1,2,2-Tetrachloroethane	79-34-5	1.00 ppm	1.04 ppm
4-Ethyltoluene	622-96-8	1.00 ppm	1.00 ppm
1,3,5-Trimethylbenzene	108-67-8	1.00 ppm	1.00 ppm
1,2,4-Trimethylbenzene	95-63-6	1.00 ppm	0.99 ppm

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PAGE: 3 of 3

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
1,3-Dichlorobenzene	541-73-1	1.00 ppm	0.96 ppm
Benzyl Chloride (Analytical Accuracy ± 10%)	100-44-7	1.00 ppm	0.96 ppm
1,4-Dichlorobenzene	106-46-7	1.00 ppm	0.98 ppm
1,2-Dichlorobenzene	95-50-1	1.00 ppm	0.97 ppm
1,2,4-Trichlorobenzene	120-82-1	1.00 ppm	0.88 ppm
Naphthalene (Analytical Accuracy ± 10%)	91-20-3	1.00 ppm	0.91 ppm
Hexachloro-1,3-Butadiene	87-68-3	1.00 ppm	0.93 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Nov-12-2016

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PAGE: 1 of 1

SS0997

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103808
Certification Date:	Nov-11-2016	**Cylinder Pressure:**	1000 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	58 Liters
Expiration Date:	Nov-11-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Chlorodifluoromethane	75-45-6	1.00 ppm	1.04 ppm
Acetaldehyde (Analytical Accuracy ± 10%)	75-07-0	2.00 ppm	2.19 ppm
Methanol (Analytical Accuracy ± 10%)	67-56-1	2.00 ppm	1.90 ppm
Dichlorofluoromethane	75-43-4	1.00 ppm	1.06 ppm
Vinyl Bromide	593-60-2	1.00 ppm	1.01 ppm
Acrylonitrile (Analytical Accuracy ± 10%)	107-13-1	1.00 ppm	1.15 ppm
Tert Butanol (Analytical Accuracy ± 10%)	75-65-0	1.00 ppm	1.10 ppm
Allyl Chloride	107-05-1	1.00 ppm	1.10 ppm
2,2,4-Trimethylpentane	540-84-1	1.00 ppm	1.03 ppm
Cumene	98-82-8	1.00 ppm	0.97 ppm
alpha-Pinene (No Stability Guarantee)	7785-70-8	1.00 ppm	1.10 ppm
o-Chlorotoluene	95-49-8	1.00 ppm	1.02 ppm
n-Propylbenzene	103-65-1	1.00 ppm	0.97 ppm
beta-Pinene (No Stability Guarantee)	127-91-3	1.00 ppm	1.09 ppm
Sec-Butyl Benzene	135-98-8	1.00 ppm	0.98 ppm
n-Butyl Benzene	104-51-8	1.00 ppm	0.98 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Nov-11-2016

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PAGE: 1 of 1

ES1002

CERTIFICATE OF ANALYSIS

Sales#:	114722347	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3074830	**Cylinder # :**	AB-102969
Certification Date:	Dec-30-2016	**Cylinder Pressure:**	500 psig
P.O.# :	Marcus Hueppe	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	29 Liters
Expiration Date:	Dec-30-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
1,2,3-Trichloropropane	96-18-4	1.00 ppm	1.00 ppm
1,2-Dibromo-3-Chloropropane	96-12-8	1.00 ppm	0.93 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Dec-30-2016

Linde Gas North America LLC

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Atmospheric Analysis & Consulting, Inc.

CLIENT : CleanAir Engineering
PROJECT NAME : SIMS Metal Management
PROJECT NUMBER : 13318
AAC PROJECT NO. : 171471
REPORT DATE : 09/27/2017

On September 22, 2017, Atmospheric Analysis & Consulting, Inc. received two (2) Six-Liter Summa Canisters for Volatile Organic Compounds analysis by EPA method TO-15. Upon receipt each sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab ID	Return Pressure (mmHga)
TTE Exhaust Run No.5	171471-103404	584.3
TTE Exhaust Run No.6	171471-103408	580.2

All of the analyses mentioned above were performed in accordance with AAC's ISO/IEC 17025:2005 and NELAP approved Quality Assurance Plan. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at www.aaclab.com.

I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of these samples. The Laboratory Director or his/her designee, as verified by the following signature, has authorized release of the data contained in this hardcopy report.

If you have any questions or require further explanation of data results, please contact the undersigned.

Marcus Hueppe
Laboratory Director

This report consists of 60 pages.

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Atmospheric Analysis & Consulting, Inc.

SAMPLE RECEIPT / LOG-IN REPORT

AAC Project No: 171471 **Received By: W.Schneider**

Sample Receipt Date	Project Desc	Clients ID	Matrix	Sampling Date/Time	Sampled By	Sample #	Analysis Requested
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 5 Imp 1	Liquid	09/20/2017	Client	103401	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 5 Imp 2 & 3	Liquid	09/20/2017	Client	103402	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 5	Silica Gel Tube	09/20/2017	Client	103403	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 5	Summa Canister	09/20/2017	Client	103404	TO15 Tics
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 6 Imp 1	Liquid	09/20/2017	Client	103405	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 6 Imp 2 & 3	Liquid	09/20/2017	Client	103406	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 6	Silica Gel Tube	09/20/2017	Client	103407	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Run No. 6	Summa Canister	09/20/2017	Client	103408	TO15 Tics
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Field Blank Imp 1	Liquid	09/20/2017	Client	103409	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Field Blank Imp 2 & 3	Liquid	09/20/2017	Client	103410	Sub-contract
09/22/2017 0930	Clean Air Engineering SIMS Metal Management	TTE Exhaust Field Blank	Silica Gel Tube	09/20/2017	Client	103411	Sub-contract

SAMPLE RECEIPT / LOG-IN REPORT

AAC Project No: 171471 **Received By: W.Schneider**

Sample Receipt Date	Project Desc	Clients ID	Matrix	Sampling Date/Time	Sampled By	Sample #	Analysis Requested

TURN AROUND TIME: Normal (10days)

Lab Due Date: 09/29/2017

Total Samples: 11

REMARKS:
Client returned 4x cans (2x unused) + 2x flows.

On 9/25/2017, it was discovered that the reagent blank impinger was broken. The rest of the vials and silica gel tubes were sent to the subcontract lab but the reagent blank was not.

Atmospheric Analysis & Consulting, Inc.

CANISTER PRESSURE LOG

Client: Clean Air Engineering

Project No.: 171471

Date: 09/22/2017

Canister #	Sample #	Initial Pressure mmHg	Final Pressure mmHg
624	103404	584.3	1021.4
810	103408	580.2	1032.9

1

#171471

CLIENT: SIMS Metal Management
PLANT: Johnston, RI
PROJECT MANAGER: S. Brown

PROJECT: 13318
DEPT.: 66

66-13318-4

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
TO-15	SEE BELOW (IF APPLICABLE)	Summa Canister

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

FORWARDING LAB
AAC
1534 Eastman Avenue Suite A
Ventura, CA 93003
(805) 650-1642
Marcus Hueppe

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	TO-15			Archive	ADDITIONAL INFORMATION
103404	9/20	TTE Exhaust	5	Summa Canister sn 3245	1		X				
103408	9/20	TTE Exhaust	6	Summa Canister sn 4542	1		X				See Methodology sent with original request for analysis

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
B. Ansell	9/20/17 6:00 PM					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
[illegible]	9/22/17 0830					[illegible] 9/22/2017

FEDEX

TO-15 REPORTS

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171471
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/22/2017
DATE REPORTED : 09/27/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.5			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.6			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171471-103404				171471-103408				
Date Sampled	09/20/2017				09/20/2017				
Date Analyzed	09/26/2017				09/26/2017				
Can Dilution Factor	1.75				1.78				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Chlorodifluoromethane	8100		500	437	1730		20	17.8	0.5
Propene	4410		500	874	402		20	35.6	1.0
Dichlorodifluoromethane	3940		500	437	1260		20	17.8	0.5
Chloromethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Dichlorotetrafluoroethane	103		20	17.5	<SRL	U	20	17.8	0.5
Vinyl Chloride	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Methanol	<SRL	U	20	175	<SRL	U	20	178	5.0
1,3-Butadiene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Bromomethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Chloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Dichlorofluoromethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Ethanol	<SRL	U	20	69.9	<SRL	U	20	71.2	2.0
Vinyl Bromide	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Acetone	<SRL	U	20	69.9	<SRL	U	20	71.2	2.0
Trichlorofluoromethane	4370		500	437	591		20	17.8	0.5
2-Propanol (IPA)	<SRL	U	20	69.9	<SRL	U	20	71.2	2.0
Acrylonitrile	<SRL	U	20	35.0	<SRL	U	20	35.6	1.0
1,1-Dichloroethene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Methylene Chloride (DCM)	<SRL	U	20	35.0	<SRL	U	20	35.6	1.0
Allyl Chloride	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Carbon Disulfide	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Trichlorotrifluoroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
trans-1,2-Dichloroethene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,1-Dichloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Methyl Tert Butyl Ether (MTBE)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Vinyl Acetate	<SRL	U	20	35.0	<SRL	U	20	35.6	1.0
2-Butanone (MEK)	<SRL	U	20	35.0	<SRL	U	20	35.6	1.0
cis-1,2-Dichloroethene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Hexane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Chloroform	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Ethyl Acetate	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Tetrahydrofuran	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2-Dichloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,1,1-Trichloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5

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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171471
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/22/2017
DATE REPORTED : 09/27/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	TTE Exhaust Run No.5			Sample Reporting Limit (SRL) (MRLxDF's)	TTE Exhaust Run No.6			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	171471-103404				171471-103408				
Date Sampled	09/20/2017				09/20/2017				
Date Analyzed	09/26/2017				09/26/2017				
Can Dilution Factor	1.75				1.78				
	Result	Qualifier	Analysis DF		Result	Qualifier	Analysis DF		
Benzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Carbon Tetrachloride	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Cyclohexane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2-Dichloropropane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Bromodichloromethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,4-Dioxane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Trichloroethene (TCE)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
2,2,4-Trimethylpentane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Heptane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
cis-1,3-Dichloropropene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
4-Methyl-2-pentanone (MiBK)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
trans-1,3-Dichloropropene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,1,2-Trichloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Toluene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
2-Hexanone (MBK)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Dibromochloromethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2-Dibromoethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Tetrachloroethene (PCE)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Chlorobenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Ethylbenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
m & p-Xylenes	<SRL	U	20	35.0	<SRL	U	20	35.6	1.0
Bromoform	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Styrene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,1,2,2-Tetrachloroethane	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
o-Xylene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
4-Ethyltoluene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,3,5-Trimethylbenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2,4-Trimethylbenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,3-Dichlorobenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,4-Dichlorobenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2-Dichlorobenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
1,2,4-Trichlorobenzene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
Hexachlorobutadiene	<SRL	U	20	17.5	<SRL	U	20	17.8	0.5
BFB-Surrogate Std. % Recovery	97%				97%				70-130%

U - Compound was analyzed for, but was not detected at or above the SRL.

Marcus Hueppe
Laboratory Director

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Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : CleanAir Engineering
PROJECT NO : 171471
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 09/22/2017
DATE REPORTED : 09/27/2017

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.5	
AAC ID	171471-103404	
Date Sampled	09/20/2017	
Date Analyzed	09/26/2017	
Can Dilution Factor	1.75	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	4620	43
1,2-Propadiene	394	90
1-Chloro-1-fluoroethene	98.9	96
Butane	701	72
2-Methylbutane	191	78
Cyclopentane	298	90
BFB-Surrogate Std. % Recovery	97%	

TENTATIVELY IDENTIFIED COMPOUNDS

Client ID	TTE Exhaust Run No.6	
AAC ID	171471-103408	
Date Sampled	09/20/2017	
Date Analyzed	09/26/2017	
Can Dilution Factor	1.78	
Compound	*PPB(V/V)*	*Spectra Identification Quality*
Norflurane	1730	83
1,2-Propadiene	41.6	90
1-Chloro-1-fluoroethene	35.2	91
Isobutane	261	42
Butane	477	72
2-Methylbutane	173	80
Pentane	27.3	64
Cyclopentane	228	72
BFB-Surrogate Std. % Recovery	97%	

Marcus Hueppe
Laboratory Director

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TO-15 QC REPORT

Atmospheric Analysis & Consulting, Inc.

ANALYSIS DATE : 09/26/2017
ANALYST : JJG
INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : PS082817-02

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 08/29/2017 Calibration

Compounds	Conc	Daily Conc	%REC*
4-BFB (surrogate standard)	10.00	9.91	99
Chlorodifluoromethane	10.40	10.62	102
Propene	10.90	10.80	99
Dichlorodifluoromethane	10.60	10.63	100
Chloromethane	10.30	11.75	114
Dichlorotetrafluoroethane	10.00	11.09	111
Vinyl Chloride	10.10	11.02	109
Methanol	19.00	19.69	104
1,3-Butadiene	10.50	10.57	101
Bromomethane	10.00	10.64	106
Chloroethane	9.70	10.06	104
Dichlorofluoromethane	10.60	10.88	103
Ethanol	9.10	8.07	89
Vinyl Bromide	10.10	10.94	108
Acetone	10.60	12.44	117
Trichlorofluoromethane	10.40	11.79	113
2-Propanol (IPA)	10.80	12.26	114
Acrylonitrile	11.50	13.00	113
1,1-Dichloroethene	10.80	12.40	115
Methylene Chloride (DCM)	10.50	12.06	115
Allyl Chloride	11.00	10.56	96
Carbon Disulfide	10.00	10.52	105
Trichlorotrifluoroethane	10.70	11.28	105
trans-1,2-Dichloroethene	10.10	10.29	102
1,1-Dichloroethane	10.50	11.13	106
Methyl Tert Butyl Ether (MTBE)	10.60	11.12	105
Vinyl Acetate	10.80	10.92	101
2-Butanone (MEK)	10.60	10.38	98
cis-1,2-Dichloroethene	10.60	10.72	101
Hexane	10.50	10.92	104
Chloroform	10.90	10.85	100
Ethyl Acetate	10.90	11.04	101
Tetrahydrofuran	10.50	10.19	97
1,2-Dichloroethane	10.60	10.35	98
1,1,1-Trichloroethane	10.60	10.43	98

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Atmospheric Analysis & Consulting, Inc.

ANALYSIS DATE : 09/26/2017
ANALYST : JJG

INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : PS082817-02

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 08/29/2017 Calibration

Compounds	Conc	Daily Conc	%REC*
Benzene	10.40	11.73	113
Carbon Tetrachloride	10.80	11.36	105
Cyclohexane	10.50	11.49	109
1,2-Dichloropropane	10.50	10.74	102
Bromodichloromethane	10.40	11.58	111
1,4-Dioxane	10.40	10.28	99
Trichloroethene (TCE)	10.40	11.68	112
2,2,4-Trimethylpentane	10.30	11.02	107
Heptane	10.40	12.12	117
cis-1,3-Dichloropropene	10.70	12.06	113
4-Methyl-2-pentanone (MiBK)	10.00	10.65	107
trans-1,3-Dichloropropene	10.00	11.14	111
1,1,2-Trichloroethane	10.40	12.05	116
Toluene	10.60	12.17	115
2-Hexanone (MBK)	10.80	10.83	100
Dibromochloromethane	9.90	10.68	108
1,2-Dibromoethane	10.40	11.22	108
Tetrachloroethene (PCE)	10.30	11.52	112
Chlorobenzene	10.50	10.91	104
Ethylbenzene	10.50	10.11	96
m & p-Xylenes	20.00	21.54	108
Bromoform	10.40	11.12	107
Styrene	10.30	11.31	110
1,1,2,2-Tetrachloroethane	10.40	11.08	107
o-Xylene	10.40	10.68	103
4-Ethyltoluene	10.00	10.15	102
1,3,5-Trimethylbenzene	10.00	10.30	103
1,2,4-Trimethylbenzene	9.90	10.92	110
Benzyl Chloride (a-Chlorotoluene)	9.60	9.41	98
1,3-Dichlorobenzene	9.60	9.58	100
1,4-Dichlorobenzene	9.80	10.14	103
1,2-Dichlorobenzene	9.70	9.77	101
1,2,4-Trichlorobenzene	8.80	8.75	99
Hexachlorobutadiene	9.30	9.51	102

* - %REC should be 70-130%

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

CLIENT ID	**: Laboratory Control Spike**	**DATE ANALYZED**	**: 09/26/2017**
AAC ID	**: LCS/LCSD**	**DATE REPORTED**	**: 09/26/2017**
MEDIA	**: Air**	**UNITS**	**: ppbv**

TO-15 Laboratory Control Spike Recovery

Compound	Sample Conc.	Spike Added	Spike Res	Dup Spike Res	Spike % Rec *	Spike Dup % Rec *	RPD** %
1,1-Dichloroethene	0.0	10.80	12.40	13.04	115	121	5.0
Methylene Chloride (DCM)	0.0	10.50	12.06	12.51	115	119	3.7
Benzene	0.0	10.40	11.73	10.61	113	102	10.0
Trichloroethene (TCE)	0.0	10.40	11.68	9.57	112	92	19.9
Toluene	0.0	10.60	12.17	10.43	115	98	15.4
Tetrachloroethene (PCE)	0.0	10.30	11.52	10.19	112	99	12.3
Chlorobenzene	0.0	10.50	10.91	10.64	104	101	2.5
Ethylbenzene	0.0	10.50	10.11	11.03	96	105	8.7
m & p-Xylenes	0.0	20.00	21.54	22.12	108	111	2.7
o-Xylene	0.0	10.40	10.68	10.84	103	104	1.5

* Must be 70-130%

** Must be < 25%

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Atmospheric Analysis & Consulting, Inc.

Method Blank Analysis Report

MATRIX	: AIR	ANALYSIS DATE	: 09/26/2017
UNITS	: ppbv	REPORT DATE	: 09/26/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / AAC ID	Method Blank MB 092617	RL
Chlorodifluoromethane	<RL	0.5
Propene	<RL	1.0
Dichlorodifluoromethane	<RL	0.5
Chloromethane	<RL	0.5
Dichlorotetrafluoroethane	<RL	0.5
Vinyl Chloride	<RL	0.5
Methanol	<RL	5.0
1,3-Butadiene	<RL	0.5
Bromomethane	<RL	0.5
Chloroethane	<RL	0.5
Dichlorofluoromethane	<RL	0.5
Ethanol	<RL	2.0
Vinyl Bromide	<RL	0.5
Acetone	<RL	2.0
Trichlorofluoromethane	<RL	0.5
2-Propanol (IPA)	<RL	2.0
Acrylonitrile	<RL	1.0
1,1-Dichloroethene	<RL	0.5
Methylene Chloride (DCM)	<RL	1.0
Allyl Chloride	<RL	0.5
Carbon Disulfide	<RL	0.5
Trichlorotrifluoroethane	<RL	0.5
trans-1,2-Dichloroethene	<RL	0.5
1,1-Dichloroethane	<RL	0.5
Methyl Tert Butyl Ether (MTBE)	<RL	0.5
Vinyl Acetate	<RL	1.0
2-Butanone (MEK)	<RL	1.0
cis-1,2-Dichloroethene	<RL	0.5
Hexane	<RL	0.5
Chloroform	<RL	0.5
Ethyl Acetate	<RL	0.5
Tetrahydrofuran	<RL	0.5
1,2-Dichloroethane	<RL	0.5
1,1,1-Trichloroethane	<RL	0.5
Benzene	<RL	0.5
Carbon Tetrachloride	<RL	0.5
Cyclohexane	<RL	0.5
1,2-Dichloropropane	<RL	0.5
Bromodichloromethane	<RL	0.5
1,4-Dioxane	<RL	0.5
Trichloroethene (TCE)	<RL	0.5
2,2,4-Trimethylpentane	<RL	0.5
Heptane	<RL	0.5

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Atmospheric Analysis & Consulting, Inc.

Method Blank Analysis Report

MATRIX	: AIR	ANALYSIS DATE	: 09/26/2017
UNITS	: ppbv	REPORT DATE	: 09/26/2017

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID / *AAC ID*	Method Blank MB 092617	RL
cis-1,3-Dichloropropene	<RL	0.5
4-Methyl-2-pentanone (MiBK)	<RL	0.5
trans-1,3-Dichloropropene	<RL	0.5
1,1,2-Trichloroethane	<RL	0.5
Toluene	<RL	0.5
2-Hexanone (MBK)	<RL	0.5
Dibromochloromethane	<RL	0.5
1,2-Dibromoethane	<RL	0.5
Tetrachloroethene (PCE)	<RL	0.5
Chlorobenzene	<RL	0.5
Ethylbenzene	<RL	0.5
m & p-Xylenes	<RL	1.0
Bromoform	<RL	0.5
Styrene	<RL	0.5
1,1,2,2-Tetrachloroethane	<RL	0.5
o-Xylene	<RL	0.5
4-Ethyltoluene	<RL	0.5
1,3,5-Trimethylbenzene	<RL	0.5
1,2,4-Trimethylbenzene	<RL	0.5
Benzyl Chloride (a-Chlorotoluene)	<RL	0.5
1,3-Dichlorobenzene	<RL	0.5
1,4-Dichlorobenzene	<RL	0.5
1,2-Dichlorobenzene	<RL	0.5
1,2,4-Trichlorobenzene	<RL	0.5
Hexachlorobutadiene	<RL	0.5
System Monitoring Compounds		
BFB-Surrogate Std. % Recovery	97%	--

RL - Reporting Limit

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

AAC ID	: 171480-103452	DATE ANALYZED	: 09/26/2017
MATRIX	: Air	DATE REPORTED	: 09/26/2017
		UNITS	: ppbv

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Chlorodifluoromethane	<SRL	<SRL	0.0
Propene	756	813	7.3
Dichlorodifluoromethane	<SRL	<SRL	0.0
Chloromethane	<SRL	<SRL	0.0
Dichlorotetrafluoroethane	<SRL	<SRL	0.0
Vinyl Chloride	<SRL	<SRL	0.0
Methanol	<SRL	<SRL	0.0
1,3-Butadiene	<SRL	<SRL	0.0
Bromomethane	<SRL	<SRL	0.0
Chloroethane	<SRL	<SRL	0.0
Dichlorofluoromethane	<SRL	<SRL	0.0
Ethanol	<SRL	<SRL	0.0
Vinyl Bromide	<SRL	<SRL	0.0
Acetone	<SRL	<SRL	0.0
Trichlorofluoromethane	<SRL	<SRL	0.0
2-Propanol (IPA)	<SRL	<SRL	0.0
Acrylonitrile	<SRL	<SRL	0.0
1,1-Dichloroethene	<SRL	<SRL	0.0
Methylene Chloride (DCM)	<SRL	<SRL	0.0
Allyl Chloride	<SRL	<SRL	0.0
Carbon Disulfide	<SRL	<SRL	0.0
Trichlorotrifluoroethane	<SRL	<SRL	0.0
trans-1,2-Dichloroethene	<SRL	<SRL	0.0
1,1-Dichloroethane	<SRL	<SRL	0.0
Methyl Tert Butyl Ether (MTBE)	<SRL	<SRL	0.0
Vinyl Acetate	<SRL	<SRL	0.0
2-Butanone (MEK)	<SRL	<SRL	0.0
cis-1,2-Dichloroethene	<SRL	<SRL	0.0
Hexane	203	196	3.5
Chloroform	<SRL	<SRL	0.0
Ethyl Acetate	<SRL	<SRL	0.0
Tetrahydrofuran	<SRL	<SRL	0.0
1,2-Dichloroethane	<SRL	<SRL	0.0
1,1,1-Trichloroethane	<SRL	<SRL	0.0
Benzene	<SRL	<SRL	0.0
Carbon Tetrachloride	<SRL	<SRL	0.0

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Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

AAC ID	: 171480-103452	DATE ANALYZED	: 09/26/2017
MATRIX	: Air	DATE REPORTED	: 09/26/2017
		UNITS	: ppbv

TO-15 Duplicate Analysis

Compound	Sample Conc	Duplicate Conc	% RPD
Cyclohexane	<SRL	<SRL	0.0
1,2-Dichloropropane	<SRL	<SRL	0.0
Bromodichloromethane	<SRL	<SRL	0.0
1,4-Dioxane	<SRL	<SRL	0.0
Trichloroethene (TCE)	<SRL	<SRL	0.0
2,2,4-Trimethylpentane	119	113	5.2
Heptane	<SRL	<SRL	0.0
cis-1,3-Dichloropropene	<SRL	<SRL	0.0
4-Methyl-2-pentanone (MiBK)	<SRL	<SRL	0.0
trans-1,3-Dichloropropene	<SRL	<SRL	0.0
1,1,2-Trichloroethane	<SRL	<SRL	0.0
Toluene	<SRL	<SRL	0.0
2-Hexanone (MBK)	<SRL	<SRL	0.0
Dibromochloromethane	<SRL	<SRL	0.0
1,2-Dibromoethane	<SRL	<SRL	0.0
Tetrachloroethene (PCE)	<SRL	<SRL	0.0
Chlorobenzene	<SRL	<SRL	0.0
Ethylbenzene	<SRL	<SRL	0.0
m & p-Xylenes	<SRL	<SRL	0.0
Bromoform	<SRL	<SRL	0.0
Styrene	<SRL	<SRL	0.0
1,1,2,2-Tetrachloroethane	<SRL	<SRL	0.0
o-Xylene	<SRL	<SRL	0.0
4-Ethyltoluene	<SRL	<SRL	0.0
1,3,5-Trimethylbenzene	<SRL	<SRL	0.0
1,2,4-Trimethylbenzene	<SRL	<SRL	0.0
Benzyl Chloride (a-Chlorotoluene)	<SRL	<SRL	0.0
1,3-Dichlorobenzene	<SRL	<SRL	0.0
1,4-Dichlorobenzene	<SRL	<SRL	0.0
1,2-Dichlorobenzene	<SRL	<SRL	0.0
1,2,4-Trichlorobenzene	<SRL	<SRL	0.0
Hexachlorobutadiene	<SRL	<SRL	0.0
System Monitoring Compounds			
BFB-Surrogate Std. % Recovery	94%	95%	1.3

SRL - Sample Reporting Limit

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TO-15 RAW DATA

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261705.D Vial: 2
Acq On : 26 Sep 2017 10:07 Operator: JJG
Sample : 171471-103404 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:45 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.30	130	283458	10.00 ppbv	-0.04
36) 1,4-Difluorobenzene	17.66	114	905285	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	748928	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	477139	9.66 ppbv	0.00
Spiked Amount 10.000			Recovery =	96.60%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	6247205	2730.27 ppbv #	
3) Propene	3.23	41	1427523	1898.39 ppbv	
4) Dichlorodifluoromethane	3.35	85	4577467	1607.64 ppbv	
5) Chloromethane	3.57	52	1260	N.D.	
6) Dichlorotetrafluoroethane	3.75	135	101507	58.77 ppbv #	
7) VinylChloride	3.90	62	902	N.D.	
8) Methanol	3.98	31	1475	N.D.	
9) 1,3-Butadiene	4.13	54	693	N.D.	
10) Bromomethane	4.53	96	332	N.D.	
11) Chloroethane	4.84	64	242	N.D.	
12) Dichlorofluoromethane	5.06	67	2971	N.D.	
13) Ethanol	5.36	31	1141	N.D.	
14) VinylBromide	5.41	108	382	N.D.	
15) Acetone	6.22	43	8301	N.D.	
16) Trichlorofluoromethane	6.19	103	2954269	2006.31 ppbv	
17) 2-Propanol(IPA)	6.59	45	689	N.D.	
18) Acrylonitrile	6.86	52	94	N.D.	
19) 1,1-Dichloroethene	7.46	96	473	N.D.	
20) MethyleneChloride(DCM)	7.81	84	1821	N.D.	
21) AllylChloride	8.03	39	301	N.D.	
22) CarbonDisulfide	8.15	76	14583	N.D.	
23) Trichlorotrifluoroethane	8.50	103	486	N.D.	
24) trans-1,2-Dichloroethene	10.19	96	320	N.D.	
25) 1,1-Dichloroethane	10.76	63	4584	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.52	43	93	N.D.	
28) 2-Butanone(MEK)	12.04	43	106	N.D.	
29) cis-1,2-Dichloroethene	12.97	96	531	N.D.	
30) Hexane	13.64	41	919	N.D.	
31) Chloroform	13.71	83	917	N.D.	
32) EthylAcetate	13.94	43	113	N.D.	

Page 19

(#) = qualifier out of range (m) = manual integration
09261705.D 082917.M Tue Sep 26 12:45:26 2017

Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261705.D Vial: 2
Acq On : 26 Sep 2017 10:07 Operator: JJG
Sample : 171471-103404 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:45 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

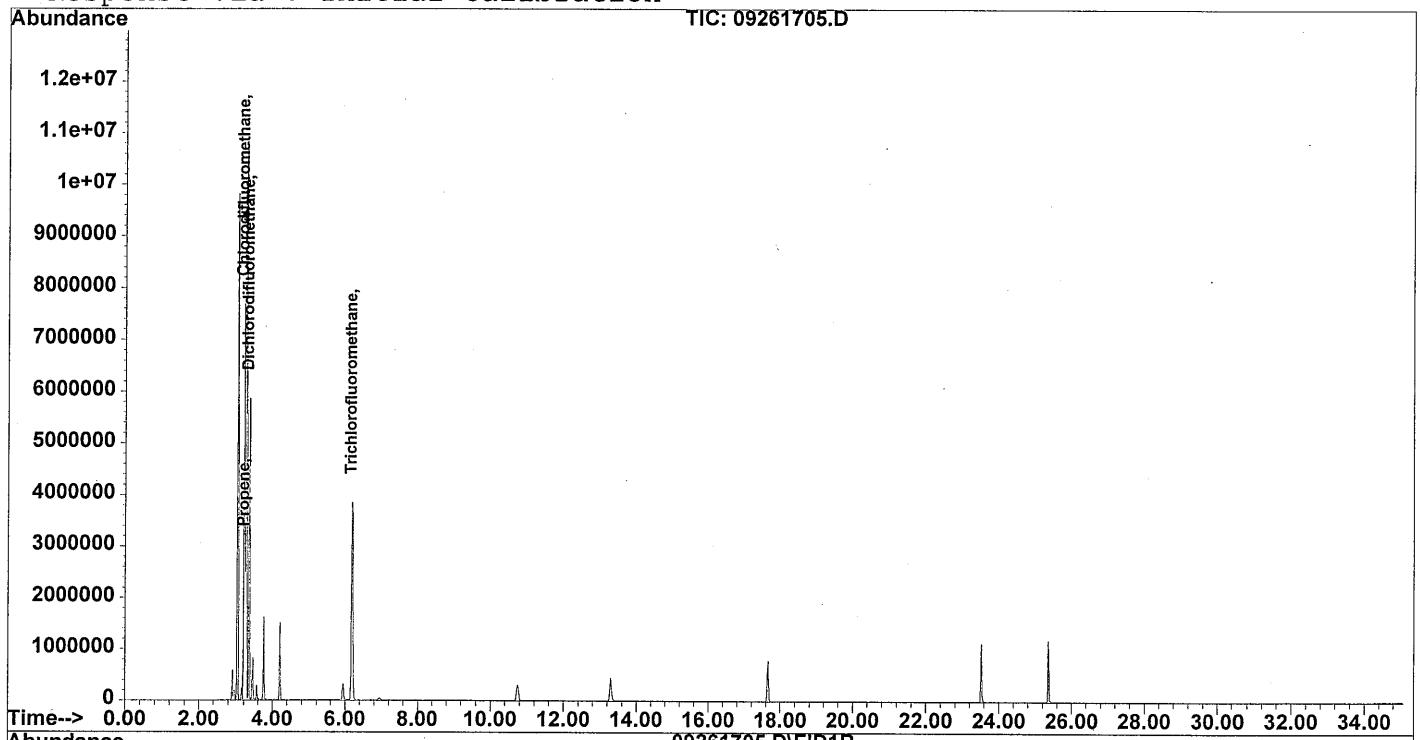
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33)	Tetrahydrofuran	14.87	42	92	N.D.	
34)	1,2-Dichloroethane	15.36	62	456	N.D.	
35)	1,1,1-Trichloroethane	15.89	97	1078	N.D.	
37)	Benzene	16.79	78	1664	N.D.	
38)	CarbonTetrachloride	17.09	117	1151	N.D.	
39)	Cyclohexane	17.31	84	683	N.D.	
40)	1,2-Dichloropropane	18.27	63	93	N.D.	
41)	Bromodichloromethane	18.66	85	565	N.D.	
42)	1,4-Dioxane	0.00	88	0	N.D.	
43)	Trichloroethene(TCE)	18.71	130	834	N.D.	
44)	2,2,4-Trimethylpentane	18.88	57	1806	N.D.	
45)	Heptane	19.34	71	322	N.D.	
46)	cis-1,3-Dichloropropene	20.06	75	917	N.D.	
47)	4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48)	trans-1,3-Dichloropropene	20.82	75	722	N.D.	
49)	1,1,2-Trichloroethane	20.99	97	680	N.D.	
50)	Toluene	21.35	91	1911	N.D.	
51)	2-Hexanone(MBK)	0.00	58	0	N.D.	
52)	Dibromochloromethane	21.85	129	1229	N.D.	
53)	1,2-Dibromoethane	22.15	107	1474	N.D.	
54)	Tetrachloroethene(PCE)	22.77	166	1179	N.D.	
56)	Chlorobenzene	23.57	114	433	N.D.	
57)	Ethylbenzene	24.06	91	2306	N.D.	
58)	m&p-Xylene	24.29	106	1967	N.D.	
59)	Bromoform	24.31	173	1924	N.D.	
60)	Styrene	24.69	104	1929	N.D.	
61)	1,1,2,2-Tetrachloroethane	24.81	83	2306	N.D.	
62)	o-Xylene	24.82	91	2052	N.D.	
64)	4-Ethyltoluene	26.38	105	2983	N.D.	
65)	1,3,5-Trimethylbenzene	26.47	105	1937	N.D.	
66)	1,2,4-Trimethylbenzene	27.00	105	2751	N.D.	
67)	BenzylChloride(a-Chlorotol	27.18	91	1614	N.D.	
68)	1,3-Dichlorobenzene	27.19	146	1803	N.D.	
69)	1,4-Dichlorobenzene	27.28	146	2137	N.D.	
70)	1,2-Dichlorobenzene	27.74	146	2165	N.D.	
71)	1,2,4-Trichlorobenzene	30.31	180	2905	N.D.	
72)	Hexachlorobutadiene	31.08	225	2029	N.D.	

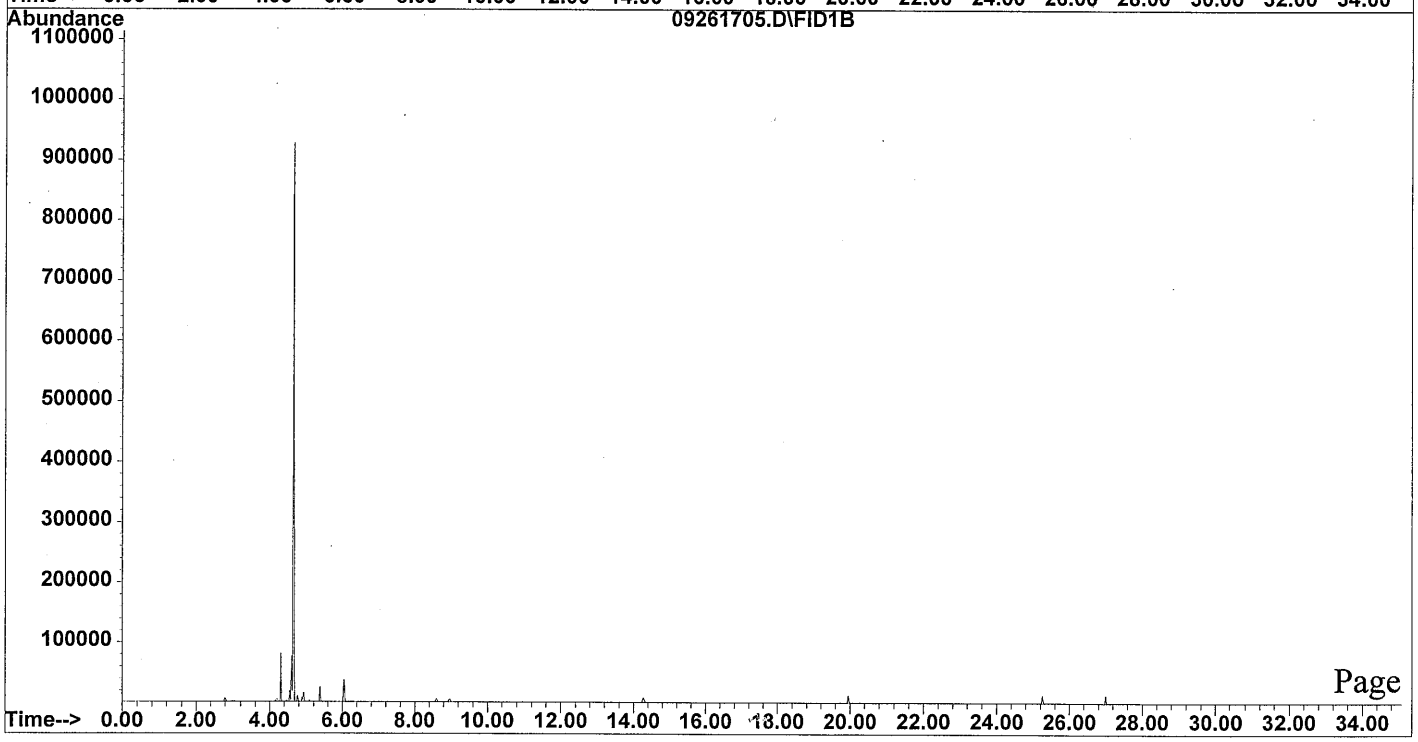
(#) = qualifier out of range (m) = manual integration
09261705.D 082917.M Tue Sep 26 12:45:28 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261705.D Vial: 2
Acq On : 26 Sep 2017 10:07 Operator: JJG
Sample : 171471-103404 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:45 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261712.D Vial: 10
Acq On : 26 Sep 2017 15:23 Operator: JJG
Sample : 171471-103404 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 16:50 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.31	130	293272	10.00 ppbv	-0.03
36) 1,4-Difluorobenzene	17.68	114	919862	10.00 ppbv	-0.01
55) Chlorobenzene-d5	23.52	117	751036	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	481166	9.71 ppbv	0.00
Spiked Amount 10.000			Recovery =	97.10%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	438975	4635.73 ppbv	
3) Propene	3.23	41	78485	2522.01 ppbv	
4) Dichlorodifluoromethane	3.34	85	265418	2252.43 ppbv	
5) Chloromethane	3.58	52	104	N.D.	
6) Dichlorotetrafluoroethane	3.76	135	3972	N.D.	
7) VinylChloride	3.77	62	95	N.D.	
8) Methanol	3.98	31	624	N.D.	
9) 1,3-Butadiene	4.06	54	104	N.D.	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.86	64	118	N.D.	
12) Dichlorofluoromethane	5.05	67	95	N.D.	
13) Ethanol	5.22	31	92	N.D.	
14) VinylBromide	5.41	108	106	N.D.	
15) Acetone	5.95	43	7554	N.D.	
16) Trichlorofluoromethane	6.21	103	152364	2500.28 ppbv	
17) 2-Propanol(IPA)	6.69	45	378	N.D.	
18) Acrylonitrile	6.91	52	99	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.83	84	979	N.D.	
21) AllylChloride	8.05	39	158	N.D.	
22) CarbonDisulfide	8.17	76	2453	N.D.	
23) Trichlorotrifluoroethane	8.47	103	117	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	0.00	63	0	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.54	43	361	N.D.	
28) 2-Butanone(MEK)	12.12	43	241	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.63	41	212	N.D.	
31) Chloroform	0.00	83	0	N.D.	
32) EthylAcetate	13.97	43	90	N.D.	

Page 22

(#) = qualifier out of range (m) = manual integration
09261712.D 082917.M Tue Sep 26 16:50:28 2017

Page 1

09/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261712.D Vial: 10
Acq On : 26 Sep 2017 15:23 Operator: JJG
Sample : 171471-103404 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 16:50 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33)	Tetrahydrofuran	14.88	42	127	N.D.	
34)	1,2-Dichloroethane	0.00	62	0	N.D.	
35)	1,1,1-Trichloroethane	0.00	97	0	N.D.	
37)	Benzene	0.00	78	0	N.D.	
38)	CarbonTetrachloride	0.00	117	0	N.D.	
39)	Cyclohexane	0.00	84	0	N.D.	
40)	1,2-Dichloropropane	18.33	63	91	N.D.	
41)	Bromodichloromethane	0.00	85	0	N.D.	
42)	1,4-Dioxane	0.00	88	0	N.D.	
43)	Trichloroethene(TCE)	0.00	130	0	N.D.	
44)	2,2,4-Trimethylpentane	18.88	57	123	N.D.	
45)	Heptane	0.00	71	0	N.D.	
46)	cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47)	4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48)	trans-1,3-Dichloropropene	0.00	75	0	N.D.	
49)	1,1,2-Trichloroethane	0.00	97	0	N.D.	
50)	Toluene	21.35	91	231	N.D.	
51)	2-Hexanone(MBK)	0.00	58	0	N.D.	
52)	Dibromochloromethane	21.78	129	91	N.D.	
53)	1,2-Dibromoethane	0.00	107	0	N.D.	
54)	Tetrachloroethene(PCE)	0.00	166	0	N.D.	
56)	Chlorobenzene	23.52	114	101	N.D.	
57)	Ethylbenzene	0.00	91	0	N.D.	
58)	m&p-Xylene	24.29	106	137	N.D.	
59)	Bromoform	0.00	173	0	N.D.	
60)	Styrene	0.00	104	0	N.D.	
61)	1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
62)	o-Xylene	0.00	91	0	N.D.	
64)	4-Ethyltoluene	26.47	105	105	N.D.	
65)	1,3,5-Trimethylbenzene	26.47	105	105	N.D.	
66)	1,2,4-Trimethylbenzene	27.07	105	106	N.D.	
67)	BenzylChloride(a-Chlorotol	0.00	91	0	N.D.	
68)	1,3-Dichlorobenzene	0.00	146	0	N.D.	
69)	1,4-Dichlorobenzene	0.00	146	0	N.D.	
70)	1,2-Dichlorobenzene	27.74	146	112	N.D.	
71)	1,2,4-Trichlorobenzene	30.31	180	242	N.D.	
72)	Hexachlorobutadiene	31.08	225	125	N.D.	

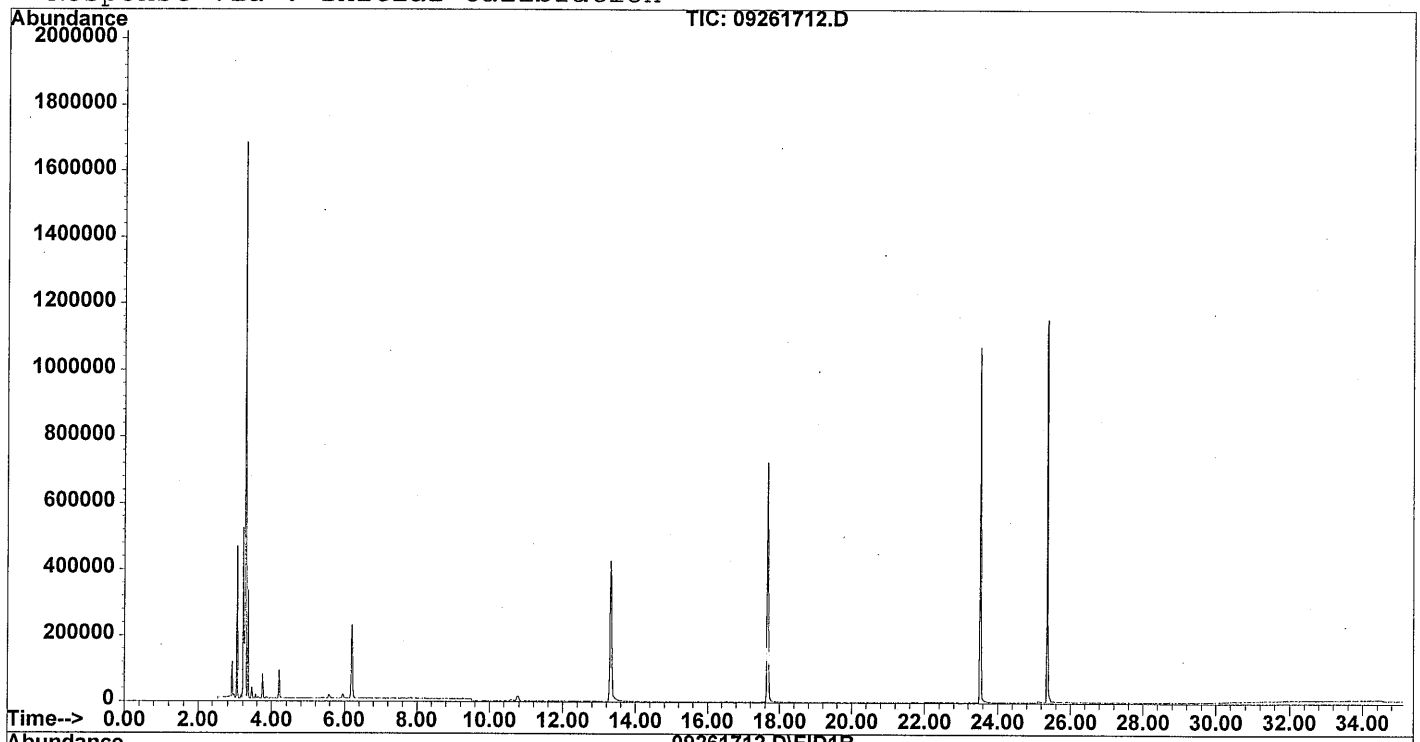
(#) = qualifier out of range (m) = manual integration
09261712.D 082917.M Tue Sep 26 16:50:29 2017

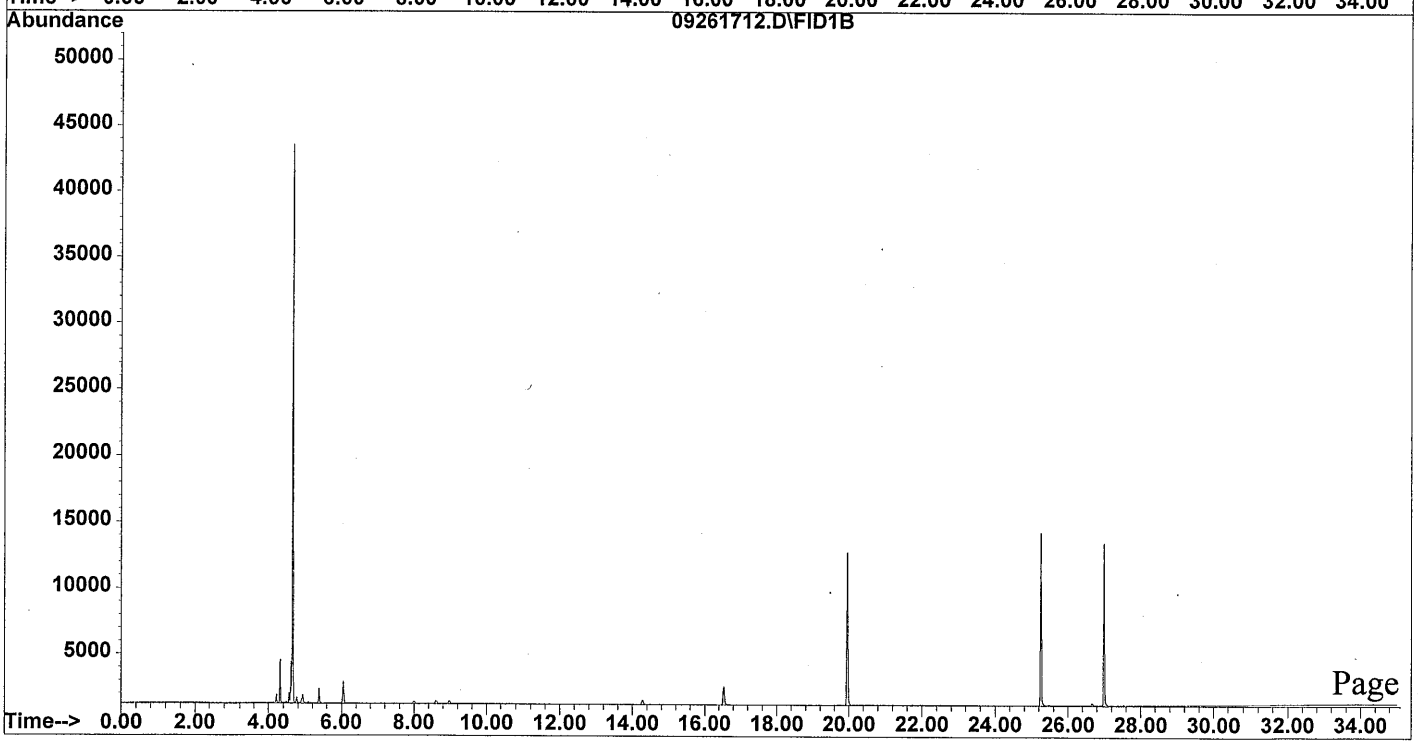
09/26/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261712.D Vial: 10
Acq On : 26 Sep 2017 15:23 Operator: JJG
Sample : 171471-103404 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 16:50 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 24

09/26/17

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261712.D Vial: 10
Acq On : 26 Sep 2017 3:23 pm Operator: JJG
Sample : 171471-103404 x500 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 100mL x100 Multiplr: 500.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****
Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.04	2642.77 ppbv	784863	Bromochloromethane	13.31

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	43
2	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	4
4	2-Aminoimidazole	83	C3H5N3	000000-00-0	4
5	1H-Imidazol-2-amine, sulfate (2:1)	83	C3H5N3	001450-93-7	4

09261712.D 082917.M Wed Sep 27 21:05:04 2017

09/27/17

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261705.D Vial: 2
Acq On : 26 Sep 2017 10:07 am Operator: JJG
Sample : 171471-103404 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****

Peak Number 1 Norflurane Concentration Rank 1

See x500 Dilution

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.03	2002.01 ppbv	14355700	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	83
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Methane, difluoro-	52	CH2F2	000075-10-5	9
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
5	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7

****

Peak Number 2 1,2-Propadiene Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.45	225.19 ppbv	1614780	Bromochloromethane	13.30

Hit# of 4	Tentative ID	MW	MolForm	CAS#	Qual
1	1,2-Propadiene	40	C3H4	000463-49-0	90
2	1-Propyne	40	C3H4	000074-99-7	83
3	1-Butanamine, 2-methyl-	87	C5H13N	000096-15-1	1
4	Ethanediimidic acid, dihydrazide	116	C2H8N6	003457-37-2	1

****

Peak Number 3 Ethene, 1-chloro-1-fluoro- Concentration Rank 7

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.56	56.58 ppbv	405698	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	96
2	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	90
3	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	81
4	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	72
5	1,3-Diazine	80	C4H4N2	000289-95-2	9

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Page 26

Peak Number 4 Butane Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.

BA 09/27/17

4.22	401.08 ppbv	2875970	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	72
2	Butane	58	C4H10	000106-97-8	59
3	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
4	Isobutane	58	C4H10	000075-28-5	9
5	Isobutane	58	C4H10	000075-28-5	7

****

Peak Number 5 Butane, 2-methyl- Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.95	109.51 ppbv	785265	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	78
2	Butane, 2-methyl-	72	C5H12	000078-78-4	72
3	Butane, 2-methyl-	72	C5H12	000078-78-4	64
4	Cyclobutane, methyl-	70	C5H10	000598-61-8	38
5	Butane, 1-chloro-2-methyl-	106	C5H11Cl	000616-13-7	12

****

Peak Number 6 Cyclopentane Concentration Rank 5

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.76	170.43 ppbv	1222100	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	90
2	1-Pentene	70	C5H10	000109-67-1	90
3	Cyclobutane, methyl-	70	C5H10	000598-61-8	86
4	1-Pentene	70	C5H10	000109-67-1	72
5	Cyclopropane, ethyl-	70	C5H10	001191-96-4	47

09261705.D 082917.M Wed Sep 27 07:22:43 2017

BA 09/27/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261706.D Vial: 3
Acq On : 26 Sep 2017 10:51 Operator: JJG
Sample : 171471-103408 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:46 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.30	130	2958190	10.00 ppbv	-0.04
36) 1,4-Difluorobenzene	17.65	114	893964	10.00 ppbv	-0.04
55) Chlorobenzene-d5	23.52	117	790048	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.36	174	507749	9.74 ppbv	-0.01
Spiked Amount 10.000			Recovery	= 97.40%	

Target Compounds					Qvalue
2) Chlorodifluoromethane	3.21	51	2325363	973.81 ppbv	
3) Propene	3.24	41	177144m	225.73 ppbv	
4) Dichlorodifluoromethane	3.36	85	2099341	706.49 ppbv	
5) Chloromethane	3.53	52	97	N.D.	
6) Dichlorotetrafluoroethane	3.77	135	704	N.D.	
7) VinylChloride	3.92	62	723	N.D.	
8) Methanol	3.90	31	144	N.D.	
9) 1,3-Butadiene	4.16	54	1150	N.D.	
10) Bromomethane	4.55	96	596	N.D.	
11) Chloroethane	4.86	64	389	N.D.	
12) Dichlorofluoromethane	5.07	67	1127	N.D.	
13) Ethanol	5.34	31	90	N.D.	
14) VinylBromide	5.42	108	245	N.D.	
15) Acetone	6.24	43	5736	N.D.	
16) Trichlorofluoromethane	6.20	103	510242	332.04 ppbv	
17) 2-Propanol(IPA)	6.65	45	99	N.D.	
18) Acrylonitrile	6.98	52	592	N.D.	
19) 1,1-Dichloroethene	7.46	96	720	N.D.	
20) MethyleneChloride(DCM)	7.81	84	2015	N.D.	
21) AllylChloride	8.09	39	762	N.D.	
22) CarbonDisulfide	8.18	76	5515	N.D.	
23) Trichlorotrifluoroethane	8.56	103	563	N.D.	
24) trans-1,2-Dichloroethene	10.19	96	293	N.D.	
25) 1,1-Dichloroethane	10.74	63	3728	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.55	43	102	N.D.	
28) 2-Butanone(MEK)	12.04	43	356	N.D.	
29) cis-1,2-Dichloroethene	12.95	96	277	N.D.	
30) Hexane	13.63	41	1288	N.D.	
31) Chloroform	13.71	83	922	N.D.	
32) EthylAcetate	14.00	43	114	N.D.	

Page 28

(#) = qualifier out of range (m) = manual integration
09261706.D 082917.M Tue Sep 26 12:46:23 2017

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261706.D Vial: 3
Acq On : 26 Sep 2017 10:51 Operator: JJG
Sample : 171471-103408 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:46 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

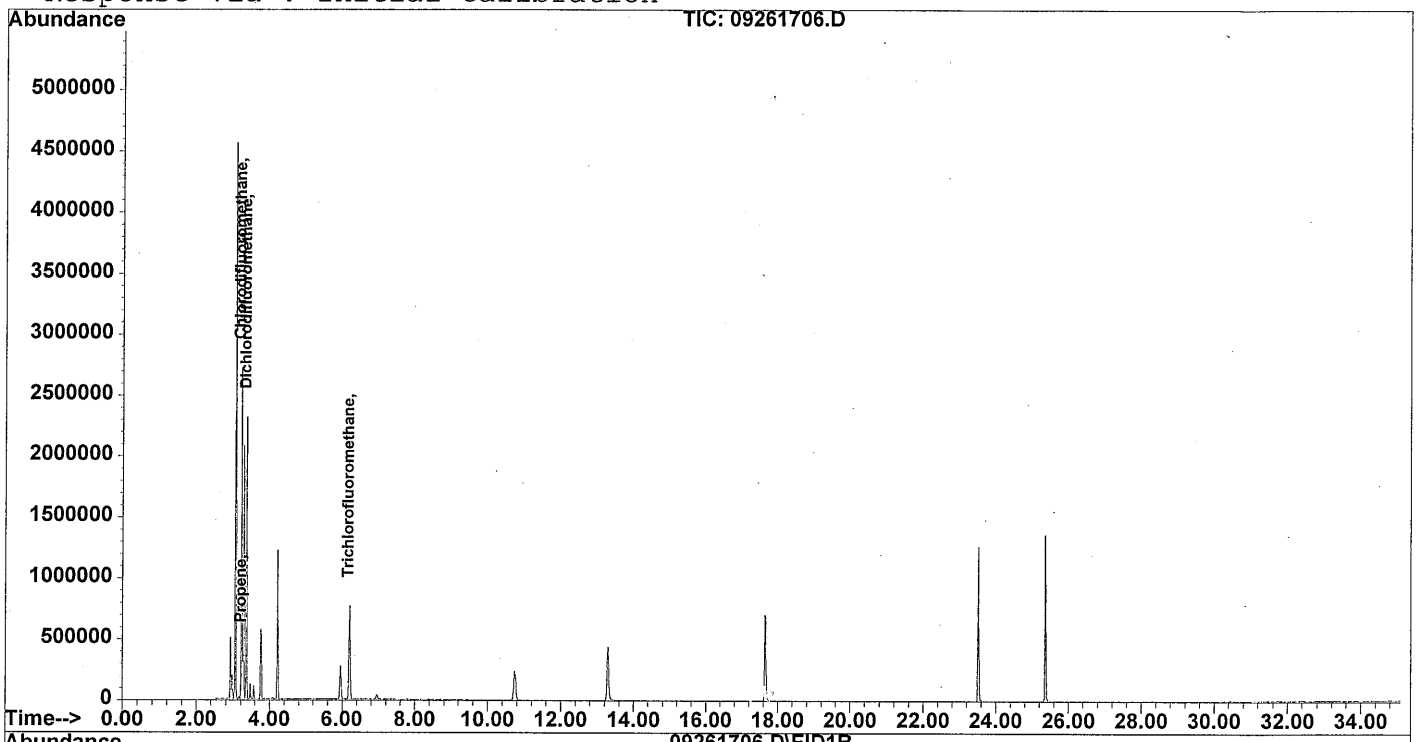
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	0.00	42	0	N.D.	
34) 1,2-Dichloroethane	15.37	62	144	N.D.	
35) 1,1,1-Trichloroethane	15.86	97	478	N.D.	
37) Benzene	16.79	78	1293	N.D.	
38) CarbonTetrachloride	17.07	117	309	N.D.	
39) Cyclohexane	17.31	84	587	N.D.	
40) 1,2-Dichloropropane	18.33	63	446	N.D.	
41) Bromodichloromethane	18.66	85	275	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	18.71	130	293	N.D.	
44) 2,2,4-Trimethylpentane	18.86	57	1435	N.D.	
45) Heptane	19.35	71	475	N.D.	
46) cis-1,3-Dichloropropene	20.06	75	233	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	20.82	75	357	N.D.	
49) 1,1,2-Trichloroethane	20.98	97	488	N.D.	
50) Toluene	21.35	91	1674	N.D.	
51) 2-Hexanone(MBK)	0.00	58	0	N.D.	
52) Dibromochloromethane	21.85	129	578	N.D.	
53) 1,2-Dibromoethane	22.15	107	794	N.D.	
54) Tetrachloroethene(PCE)	22.75	166	486	N.D.	
56) Chlorobenzene	23.58	114	287	N.D.	
57) Ethylbenzene	24.06	91	1625	N.D.	
58) m&p-Xylene	24.28	106	1310	N.D.	
59) Bromoform	24.31	173	1271	N.D.	
60) Styrene	24.69	104	1438	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.81	83	1544	N.D.	
62) o-Xylene	24.82	91	1377	N.D.	
64) 4-Ethyltoluene	26.36	105	1969	N.D.	
65) 1,3,5-Trimethylbenzene	26.48	105	1429	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	1776	N.D.	
67) BenzylChloride(a-Chlorotol	27.16	91	883	N.D.	
68) 1,3-Dichlorobenzene	27.28	146	1428	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	1428	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	1639	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	2037	N.D.	
72) Hexachlorobutadiene	31.08	225	1312	N.D.	

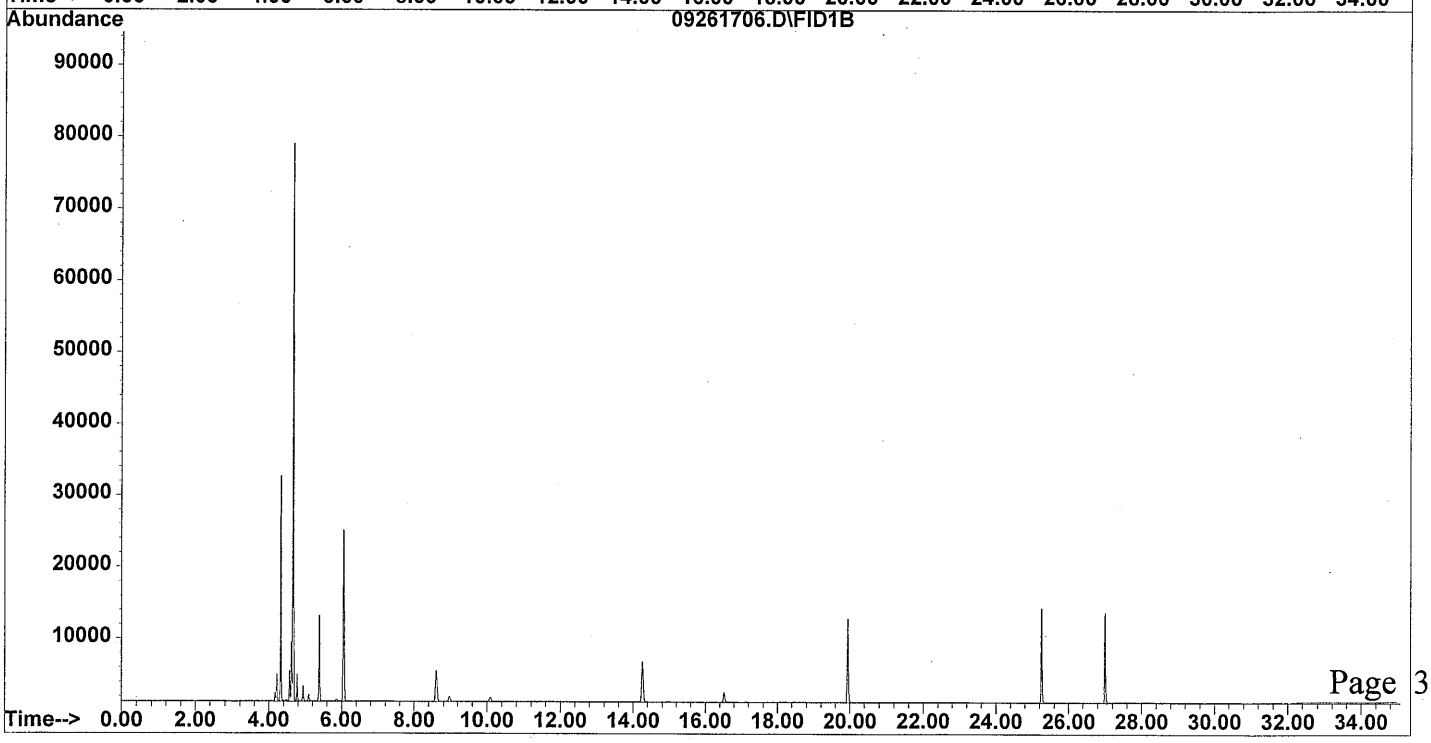
(#) = qualifier out of range (m) = manual integration
09261706.D 082917.M Tue Sep 26 12:46:25 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261706.D Vial: 3
Acq On : 26 Sep 2017 10:51 Operator: JJG
Sample : 171471-103408 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:46 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 30

Library Search Compound Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261706.D Vial: 3
Acq On : 26 Sep 2017 10:51 am Operator: JJG
Sample : 171471-103408 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Library : C:\DATABASE\NBS75K.L

****

Peak Number 1 Norflurane Concentration Rank 1

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.05	970.94 ppbv	7115400	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Norflurane	102	C2H2F4	000811-97-2	83
2	Methane, trifluoro-	70	CHF3	000075-46-7	9
3	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
4	Ethane, 1,1,1-trifluoro-	84	C2H3F3	000420-46-2	7
5	1H-Imidazol-2-amine, sulfate (2:1)	83	C3H5N3	001450-93-7	4

****

Peak Number 2 1,2-Propadiene Concentration Rank 7

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.47	23.37 ppbv	171233	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	1,2-Propadiene	40	C3H4	000463-49-0	90
2	1-Propyne	40	C3H4	000074-99-7	83
3	2,5-Furandione, dihydro-3-methyl-	114	C5H6O3	004100-80-5	4
4	2,5-Furandione, dihydro-3-methylene	112	C5H4O3	002170-03-8	2
5	Furan	68	C4H4O	000110-00-9	2

****

Peak Number 3 Ethene, 1-chloro-1-fluoro- Concentration Rank 8

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.57	19.79 ppbv	145015	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	91
2	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	87
3	Ethene, 1-chloro-1-fluoro-	80	C2H2ClF	002317-91-1	83
4	Ethene, 1-chloro-2-fluoro-	80	C2H2ClF	000460-16-2	83
5	1,3-Diazine	80	C4H4N2	000289-95-2	9

Page 31

****

Peak Number 4 Isobutane Concentration Rank 3

R.T.	EstConc	Area	Relative to ISTD	R.T.

DA 09/27/17

R.T.	EstConc	Area	Relative to ISTD	R.T.
3.77	146.82 ppbv	1075940	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Isobutane	58	C4H10	000075-28-5	42
2	Isobutane	58	C4H10	000075-28-5	38
3	Isobutane	58	C4H10	000075-28-5	33
4	Oxirane, ethyl-	72	C4H8O	000106-88-7	9
5	Oxirane, trimethyl-	86	C5H10O	005076-19-7	9

****

Peak Number 5 Butane — Concentration Rank 2

R.T.	EstConc	Area	Relative to ISTD	R.T.
4.22	267.82 ppbv	1962660	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane	58	C4H10	000106-97-8	72
2	Butane	58	C4H10	000106-97-8	47
3	Acetic acid, 2-propenyl ester	100	C5H8O2	000591-87-7	9
4	Isobutane	58	C4H10	000075-28-5	9
5	Isobutane	58	C4H10	000075-28-5	7

****

Peak Number 6 Butane, 2-methyl- — Concentration Rank 6

R.T.	EstConc	Area	Relative to ISTD	R.T.
5.94	96.91 ppbv	710212	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Butane, 2-methyl-	72	C5H12	000078-78-4	80
2	Butane, 2-methyl-	72	C5H12	000078-78-4	72
3	Butane, 2-methyl-	72	C5H12	000078-78-4	59
4	Methane, isocyanato-	57	C2H3NO	000624-83-9	9
5	Methane, isocyanato-	57	C2H3NO	000624-83-9	9

****

Peak Number 7 Pentane — Concentration Rank 9

R.T.	EstConc	Area	Relative to ISTD	R.T.
6.95	15.34 ppbv	112388	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Pentane	72	C5H12	000109-66-0	64
2	Butane, 2-methyl-	72	C5H12	000078-78-4	50
3	Butane, 2-methyl-	72	C5H12	000078-78-4	50
4	Pentane	72	C5H12	000109-66-0	45
5	Oxirane, 2,2-dimethyl-	72	C4H8O	000558-30-5	42

Page 32

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Peak Number 8 Cyclopentane — Concentration Rank 5

09/27/17

R.T.	EstConc	Area	Relative to ISTD	R.T.
10.74	127.91 ppbv	937341	Bromochloromethane	13.30

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Cyclopentane	70	C5H10	000287-92-3	72
2	Cyclobutanone	70	C4H6O	001191-95-3	64
3	1-Pentene	70	C5H10	000109-67-1	50
4	1-Pentene	70	C5H10	000109-67-1	47
5	1-Pentene	70	C5H10	000109-67-1	47

09261706.D 082917.M Wed Sep 27 07:23:25 2017

DA 09/27/17

TO-15 RAW QC & ICAL SUMMARY

MS #2 Instrument Logbook

Sequence Name: C:\HPCHEM\1\SEQUENCE\2017\092617.S
Comment: GCMS-02
Operator: JJG
Data Path: C:\HPCHEM\1\MS02\2017\092617\
Pre-Seq Cmd:
Post-Seq Cmd:

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	41	09261701	TO15G	TO15 BFB 092617
2	Sample	41	09261702	TO15G	TO15 CCV 092617
3	Sample	41	09261703	TO15G	TO15 LCSD 092617
4	Sample	1	09261704	TO15G	TO15 MB 092617
5	Sample	2	09261705	TO15G	171471-103404 x20
6	Sample	3	09261706	TO15G	171471-103408 x20
7	Sample	5	09261707	TO15G	171480-103452 x20
8	Sample	5	09261708	TO15G	171480-103452 x20 dp
9	Sample	6	09261709	TO15G	171480-103453 x20
10	Sample	7	09261710	TO15G	171480-103454 x20
11	Sample	8	09261711	TO15G	171480-103455 x20
12	Sample	10	09261712	TO15G	171471-103404 x500
13	Sample	10	09261713	TO15G	171471-103404 x500 dp
14	Sample	3	09261714	TO15G	171471-103408 x25
15	Sample	12	09261715	TO15G	171479-103451 x10
16	Sample	12	09261716	TO15G	171479-103451 x20

09/26/17

09/26/17

Comments:

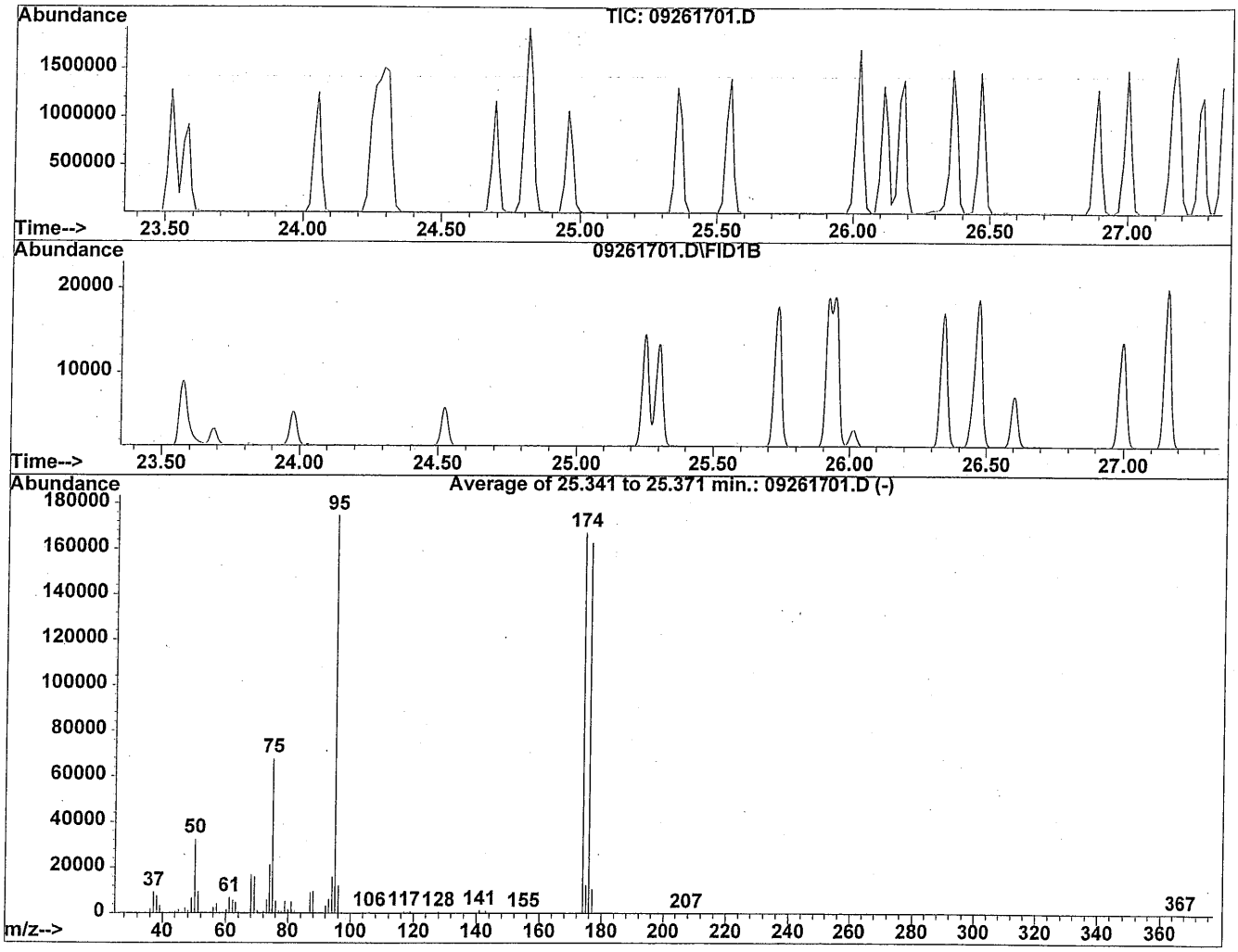
Analyst: **Date:** 09/26/17

Page 35

Page: 159 of

BFB

Data File : C:\HPCHEM\1\MS02\2017\092617\09261701.D Vial: 41
Acq On : 26 Sep 2017 7:08 am Operator: JJG
Sample : TO15 BFB 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 200mL Multiplr: 1.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14



AutoFind: Scans 1534, 1535, 1536; Background Corrected with Scan 1530

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	18.6	32409	PASS
75	95	30	60	38.7	67553	PASS
95	95	100	100	100.0	174557	PASS
96	95	5	9	7.0	12164	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	95.8	167264	PASS
175	174	5	9	7.4	12341	PASS
176	174	95	101	97.2	162531	PASS
177	176	5	9	6.6	10710	PASS

Page 36

09/26/17

09261701.D 082917.M Tue Sep 26 09:19:35 2017

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261702.D Vial: 41
Acq On : 26 Sep 2017 7:53 Operator: JJG
Sample : TO15 CCV 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:21 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.30	130	300526m	10.00 ppbv	-0.04
36) 1,4-Difluorobenzene	17.66	114	907571	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	786560	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	514083	9.91 ppbv	0.00
Spiked Amount 10.000			Recovery =	99.10%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	515470	10.62 ppbv	
3) Propene	3.23	41	172135	10.80 ppbv	
4) Dichlorodifluoromethane	3.35	85	641864	10.63 ppbv	
5) Chloromethane	3.58	52	70288	11.75 ppbv	
6) Dichlorotetrafluoroethane	3.76	135	406323	11.09 ppbv	
7) VinylChloride	3.91	62	211746	11.02 ppbv	
8) Methanol	3.94	31	158030m	19.69 ppbv	
9) 1,3-Butadiene	4.13	54	130175	10.57 ppbv	
10) Bromomethane	4.52	96	226993	10.64 ppbv	
11) Chloroethane	4.84	64	90974	10.06 ppbv	
12) Dichlorofluoromethane	5.05	67	491191	10.88 ppbv	
13) Ethanol	5.27	31	160532m	8.07 ppbv	
14) VinylBromide	5.41	108	218781	10.94 ppbv	
15) Acetone	6.01	43	421588	12.44 ppbv	
16) Trichlorofluoromethane	6.19	103	368159	11.79 ppbv	
17) 2-Propanol(IPA)	6.69	45	455942	12.26 ppbv #	
18) Acrylonitrile	6.88	52	159229	13.00 ppbv	
19) 1,1-Dichloroethene	7.47	96	228701	12.40 ppbv	
20) MethyleneChloride(DCM)	7.80	84	219322	12.06 ppbv	
21) AllylChloride	8.07	39	203026m	10.56 ppbv	
22) CarbonDisulfide	8.16	76	664303	10.52 ppbv	
23) Trichlorotrifluoroethane	8.52	103	347901	11.28 ppbv	
24) trans-1,2-Dichloroethene	10.19	96	220911	10.29 ppbv	
25) 1,1-Dichloroethane	10.73	63	435187	11.13 ppbv #	
26) MethylTertButylEther(MTBE)	11.20	73	570013m	11.12 ppbv	
27) VinylAcetate	11.51	43	701367	10.92 ppbv #	
28) 2-Butanone(MEK)	12.09	43	544074m	10.38 ppbv	
29) cis-1,2-Dichloroethene	12.96	96	245022	10.72 ppbv	
30) Hexane	13.61	41	284637	10.92 ppbv	
31) Chloroform	13.70	83	499661	10.85 ppbv	
32) EthylAcetate	13.95	43	641744	11.04 ppbv #	

Page 37

(#) = qualifier out of range (m) = manual integration
09261702.D 082917.M Tue Sep 26 09:21:38 2017 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261702.D Vial: 41
Acq On : 26 Sep 2017 7:53 Operator: JJG
Sample : TO15 CCV 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:21 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

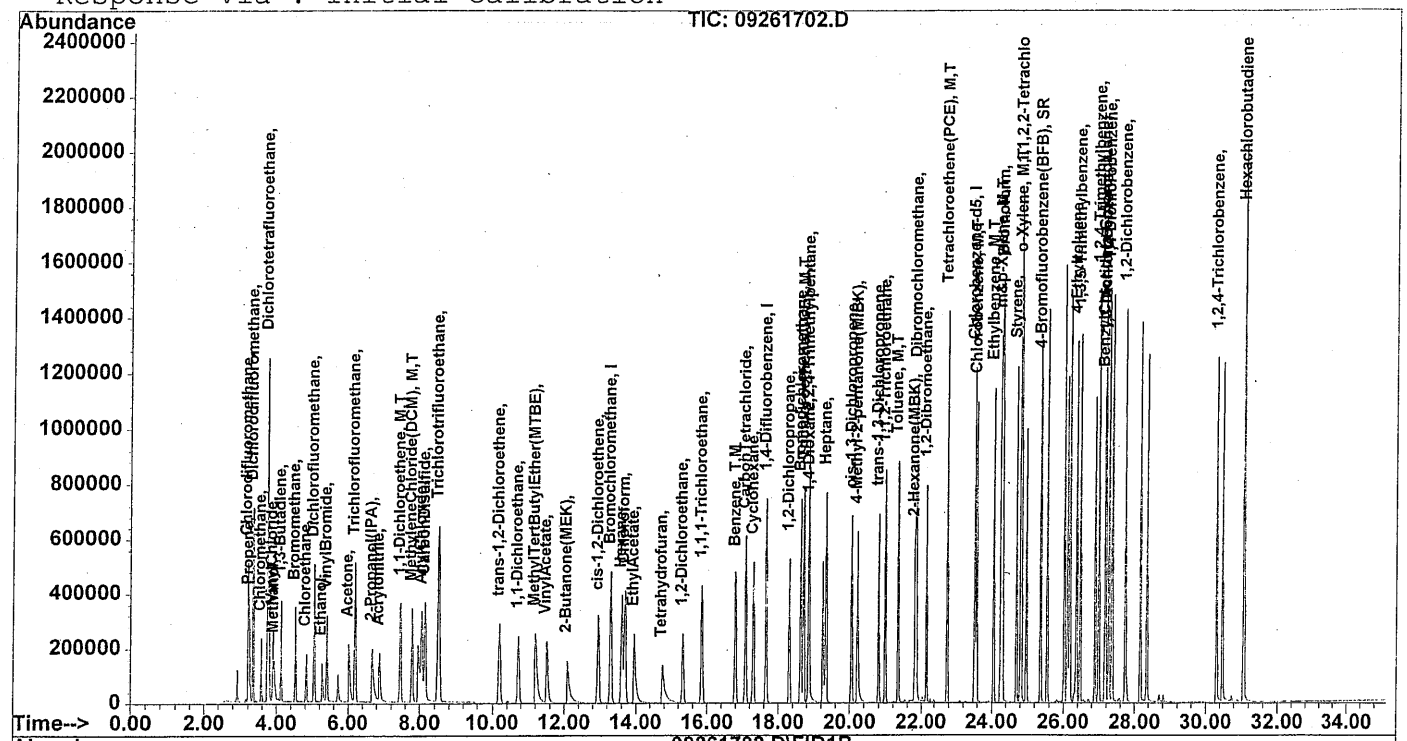
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.75	42	259195m	10.19 ppbv	
34) 1,2-Dichloroethane	15.33	62	312618	10.35 ppbv	
35) 1,1,1-Trichloroethane	15.86	97	438830	10.43 ppbv	
37) Benzene	16.81	78	648223	11.73 ppbv	96
38) CarbonTetrachloride	17.09	117	491717	11.36 ppbv	99
39) Cyclohexane	17.31	84	254869	11.49 ppbv	98
40) 1,2-Dichloropropane	18.31	63	257194	10.74 ppbv	98
41) Bromodichloromethane	18.64	85	362045	11.58 ppbv	95
42) 1,4-Dioxane	18.88	88	156654m	10.28 ppbv	
43) Trichloroethene(TCE)	18.73	130	370306	11.68 ppbv	97
44) 2,2,4-Trimethylpentane	18.86	57	994211	11.02 ppbv	98
45) Heptane	19.34	71	186193	12.12 ppbv	97
46) cis-1,3-Dichloropropene	20.06	75	423146	12.06 ppbv	98
47) 4-Methyl-2-pentanone(MiBK)	20.22	58	239993	10.65 ppbv	98
48) trans-1,3-Dichloropropene	20.80	75	384889	11.14 ppbv	98
49) 1,1,2-Trichloroethane	20.98	97	335661	12.05 ppbv	96
50) Toluene	21.33	91	801056	12.17 ppbv	98
51) 2-Hexanone(MBK)	21.81	58	303654m	10.83 ppbv	
52) Dibromochloromethane	21.85	129	686685	10.68 ppbv	99
53) 1,2-Dibromoethane	22.15	107	595689	11.22 ppbv	99
54) Tetrachloroethene(PCE)	22.75	166	483786	11.52 ppbv	98
56) Chlorobenzene	23.58	114	225806	10.91 ppbv	89
57) Ethylbenzene	24.05	91	934926	10.11 ppbv	99
58) m&p-Xylene	24.26	106	734724	21.54 ppbv	96
59) Bromoform	24.31	173	721322	11.12 ppbv #	94
60) Styrene	24.69	104	628627	11.31 ppbv	98
61) 1,1,2,2-Tetrachloroethane	24.81	83	713281	11.08 ppbv	99
62) o-Xylene	24.82	91	753110	10.68 ppbv	97
64) 4-Ethyltoluene	26.36	105	1067159	10.15 ppbv	98
65) 1,3,5-Trimethylbenzene	26.47	105	859986	10.30 ppbv	99
66) 1,2,4-Trimethylbenzene	27.00	105	907195	10.92 ppbv	97
67) BenzylChloride(a-Chlorotol	27.16	91	707558	9.41 ppbv	95
68) 1,3-Dichlorobenzene	27.19	146	676952	9.58 ppbv	97
69) 1,4-Dichlorobenzene	27.28	146	724078	10.14 ppbv	96
70) 1,2-Dichlorobenzene	27.74	146	672634	9.77 ppbv #	97
71) 1,2,4-Trichlorobenzene	30.31	180	553576m	8.75 ppbv	
72) Hexachlorobutadiene	31.08	225	504037	9.51 ppbv	97

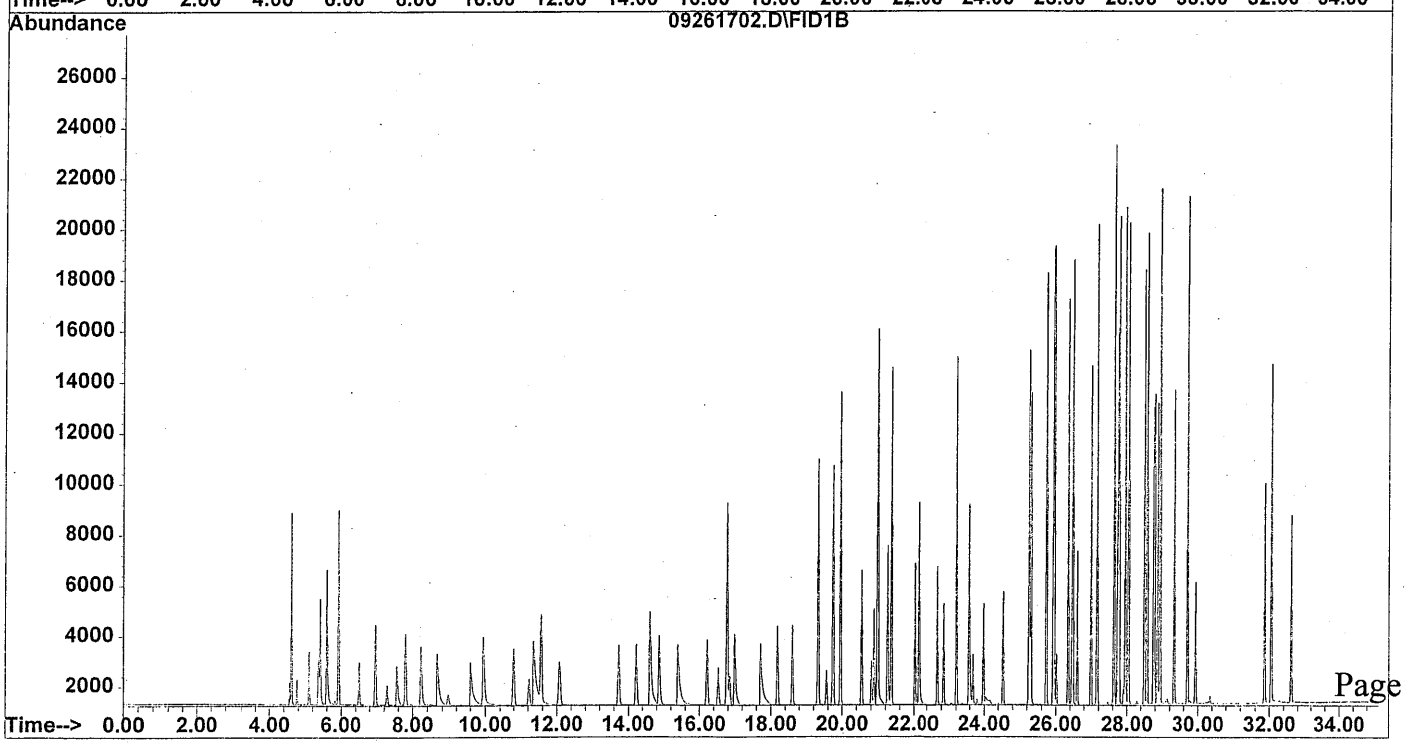
(#) = qualifier out of range (m) = manual integration
09261702.D 082917.M Tue Sep 26 09:21:39 2017

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261702.D Vial: 41
Acq On : 26 Sep 2017 7:53 Operator: JJG
Sample : TO15 CCV 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:21 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 39

9/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261703.D Vial: 41
Acq On : 26 Sep 2017 8:39 Operator: JJG
Sample : TO15 LCSD 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:23 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.29	130	298406	10.00 ppbv	-0.06
36) 1,4-Difluorobenzene	17.65	114	978956	10.00 ppbv	-0.04
55) Chlorobenzene-d5	23.52	117	787672	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.36	174	518807	9.99 ppbv	-0.01
Spiked Amount 10.000			Recovery =	99.90%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	481475	9.99 ppbv	
3) Propene	3.23	41	174214	11.00 ppbv	
4) Dichlorodifluoromethane	3.35	85	618600	10.32 ppbv	
5) Chloromethane	3.57	52	68774	11.58 ppbv	
6) Dichlorotetrafluoroethane	3.75	135	391411	10.76 ppbv	
7) VinylChloride	3.90	62	203498	10.66 ppbv	
8) Methanol	3.92	31	156564m	19.64 ppbv	
9) 1,3-Butadiene	4.13	54	134998	11.03 ppbv	
10) Bromomethane	4.52	96	225868	10.66 ppbv	
11) Chloroethane	4.84	64	88643	9.87 ppbv	
12) Dichlorofluoromethane	5.05	67	462211	10.31 ppbv	
13) Ethanol	5.26	31	175859m	8.91 ppbv	
14) VinylBromide	5.41	108	207961	10.48 ppbv	
15) Acetone	6.01	43	362905	10.78 ppbv	
16) Trichlorofluoromethane	6.19	103	320184	10.33 ppbv	
17) 2-Propanol(IPA)	6.65	45	416769	11.29 ppbv	
18) Acrylonitrile	6.86	52	160367	13.18 ppbv	
19) 1,1-Dichloroethene	7.45	96	238733	13.04 ppbv	
20) MethyleneChloride(DCM)	7.79	84	225802	12.51 ppbv	
21) AllylChloride	8.05	39	213859m	11.20 ppbv	
22) CarbonDisulfide	8.14	76	672047	10.72 ppbv	#
23) Trichlorotrifluoroethane	8.50	103	359107	11.72 ppbv	
24) trans-1,2-Dichloroethene	10.16	96	226631	10.63 ppbv	
25) 1,1-Dichloroethane	10.70	63	428913	11.05 ppbv	#
26) MethylTertButylEther(MTBE)	11.17	73	554347	10.89 ppbv	
27) VinylAcetate	11.50	43	727169	11.41 ppbv	#
28) 2-Butanone(MEK)	12.07	43	564233m	10.84 ppbv	
29) cis-1,2-Dichloroethene	12.93	96	258454	11.39 ppbv	
30) Hexane	13.60	41	275372	10.64 ppbv	
31) Chloroform	13.69	83	514672	11.26 ppbv	
32) EthylAcetate	13.92	43	636853	11.04 ppbv	

Page 40

(#) = qualifier out of range (m) = manual integration
09261703.D 082917.M Tue Sep 26 09:23:23 2017

09/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261703.D Vial: 41
Acq On : 26 Sep 2017 8:39 Operator: JJG
Sample : TO15 LCSD 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:23 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.72	42	243631m	9.65 ppbv	
34) 1,2-Dichloroethane	15.31	62	311007	10.37 ppbv	
35) 1,1,1-Trichloroethane	15.85	97	450376	10.78 ppbv	
37) Benzene	16.79	78	632640	10.61 ppbv	99
38) CarbonTetrachloride	17.07	117	471159	10.09 ppbv	99
39) Cyclohexane	17.29	84	231668	9.68 ppbv	98
40) 1,2-Dichloropropane	18.30	63	258984	10.03 ppbv	96
41) Bromodichloromethane	18.63	85	349856	10.37 ppbv	99
42) 1,4-Dioxane	18.85	88	163938m	9.97 ppbv	
43) Trichloroethene(TCE)	18.72	130	327476	9.57 ppbv	94
44) 2,2,4-Trimethylpentane	18.85	57	992676	10.20 ppbv	99
45) Heptane	19.34	71	175477	10.59 ppbv	95
46) cis-1,3-Dichloropropene	20.05	75	421393	11.13 ppbv	99
47) 4-Methyl-2-pentanone(MiBK)	20.21	58	242959	10.00 ppbv	98
48) trans-1,3-Dichloropropene	20.79	75	356192	9.55 ppbv	96
49) 1,1,2-Trichloroethane	20.98	97	334458	11.13 ppbv	96
50) Toluene	21.33	91	740114	10.43 ppbv	98
51) 2-Hexanone(MBK)	21.81	58	298394	9.87 ppbv	97
52) Dibromochloromethane	21.84	129	668545	9.64 ppbv	99
53) 1,2-Dibromoethane	22.15	107	601830	10.51 ppbv	100
54) Tetrachloroethene(PCE)	22.75	166	461677	10.19 ppbv	98
56) Chlorobenzene	23.58	114	220441	10.64 ppbv #	84
57) Ethylbenzene	24.06	91	1020961	11.03 ppbv	99
58) m&p-Xylene	24.28	106	755648	22.12 ppbv	99
59) Bromoform	24.31	173	730355	11.25 ppbv	96
60) Styrene	24.69	104	553268	9.94 ppbv	96
61) 1,1,2,2-Tetrachloroethane	24.81	83	704948	10.94 ppbv	99
62) o-Xylene	24.83	91	765587	10.84 ppbv	97
64) 4-Ethyltoluene	26.36	105	1011740	9.61 ppbv	99
65) 1,3,5-Trimethylbenzene	26.47	105	871976	10.43 ppbv	98
66) 1,2,4-Trimethylbenzene	27.00	105	887908	10.67 ppbv	98
67) BenzylChloride(a-Chlorotol	27.16	91	778339	10.33 ppbv	97
68) 1,3-Dichlorobenzene	27.18	146	698386	9.87 ppbv	96
69) 1,4-Dichlorobenzene	27.28	146	674420	9.43 ppbv	97
70) 1,2-Dichlorobenzene	27.74	146	675811	9.80 ppbv #	96
71) 1,2,4-Trichlorobenzene	30.31	180	542015m	8.56 ppbv	
72) Hexachlorobutadiene	31.08	225	492310m	9.27 ppbv	

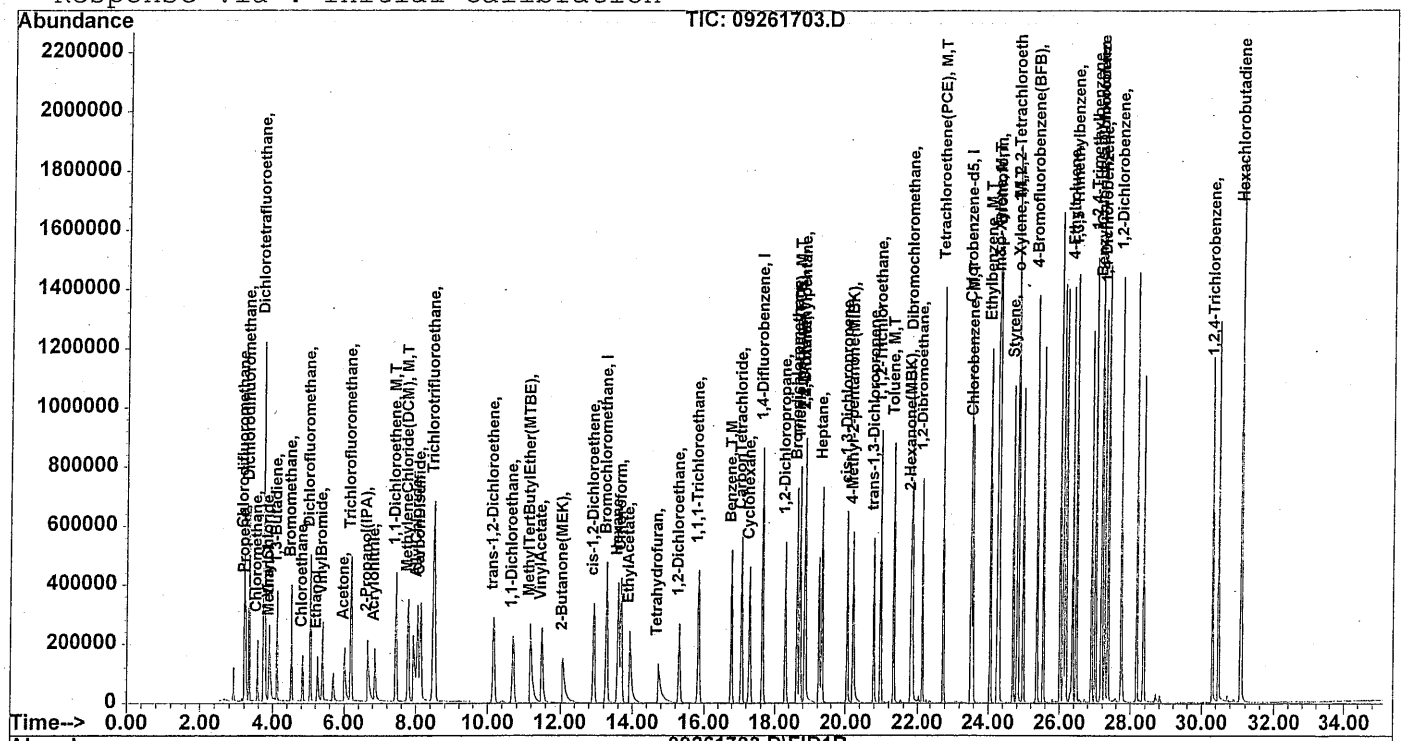
Page 41

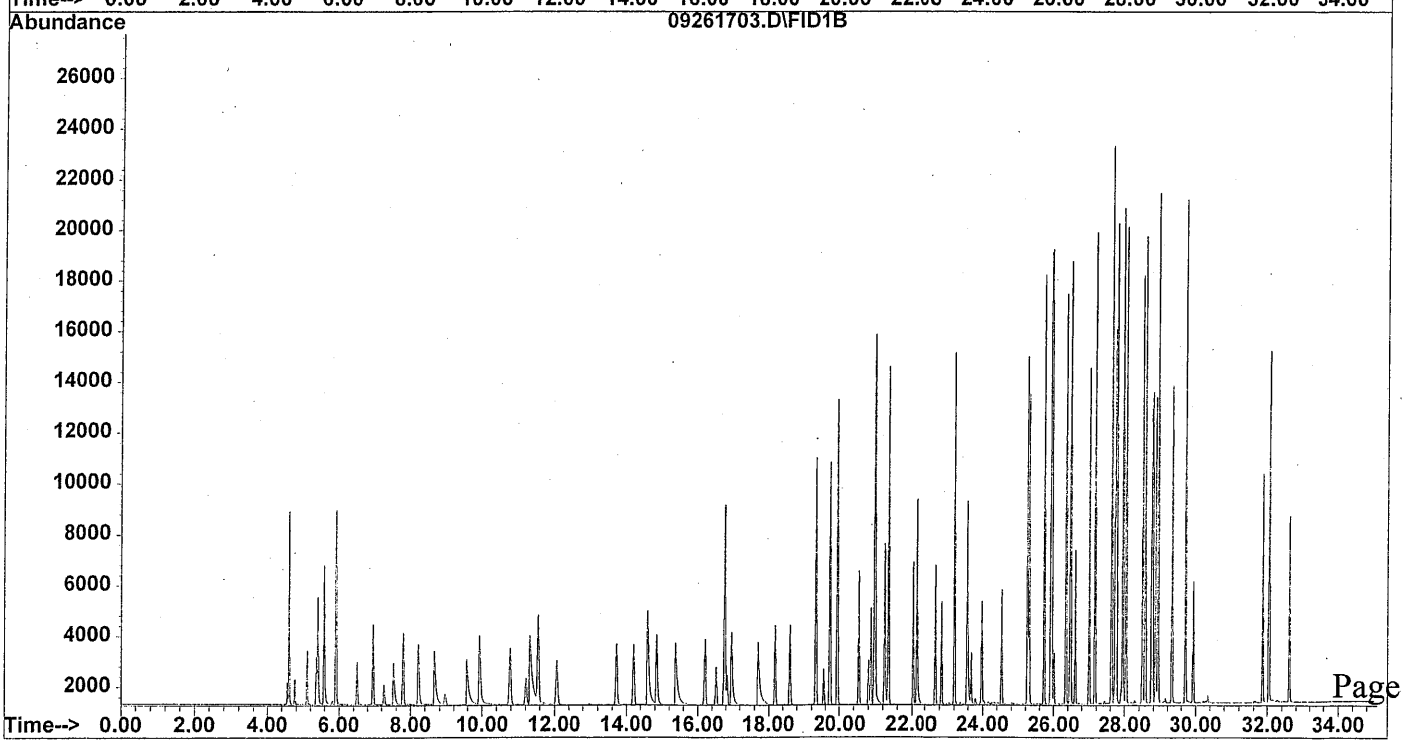
(#) = qualifier out of range (m) = manual integration
09261703.D 082917.M Tue Sep 26 09:23:24 2017 Page 2

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261703.D Vial: 41
Acq On : 26 Sep 2017 8:39 Operator: JJG
Sample : TO15 LCSD 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + Cal: PS082817-02 Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 9:23 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 42

09/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261704.D Vial: 1
Acq On : 26 Sep 2017 9:24 Operator: JJG
Sample : TO15 MB 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:43 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.28	130	294032m	10.00 ppbv	-0.06
36) 1,4-Difluorobenzene	17.66	114	928822	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	801829	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	511940	9.68 ppbv	0.00
Spiked Amount 10.000			Recovery =	96.80%	

Target Compounds					Qvalue
2) Chlorodifluoromethane	3.23	51	2295	N.D.	
3) Propene	3.24	41	584	N.D.	
4) Dichlorodifluoromethane	3.35	85	2216	N.D.	
5) Chloromethane	3.59	52	255	N.D.	
6) Dichlorotetrafluoroethane	3.77	135	1382	N.D.	
7) VinylChloride	3.92	62	841	N.D.	
8) Methanol	3.99	31	1660	N.D.	
9) 1,3-Butadiene	4.14	54	662	N.D.	
10) Bromomethane	4.53	96	693	N.D.	
11) Chloroethane	4.85	64	224	N.D.	
12) Dichlorofluoromethane	5.06	67	1790	N.D.	
13) Ethanol	5.18	31	128	N.D.	
14) VinylBromide	5.42	108	906	N.D.	
15) Acetone	5.98	43	283	N.D.	
16) Trichlorofluoromethane	6.20	103	1007	N.D.	
17) 2-Propanol(IPA)	6.65	45	106	N.D.	
18) Acrylonitrile	6.73	52	133	N.D.	
19) 1,1-Dichloroethene	7.48	96	651	N.D.	
20) MethyleneChloride(DCM)	7.81	84	2378	N.D.	
21) AllylChloride	8.08	39	1226	N.D.	
22) CarbonDisulfide	8.17	76	4651	N.D.	
23) Trichlorotrifluoroethane	8.53	103	1379	N.D.	
24) trans-1,2-Dichloroethene	10.19	96	890	N.D.	
25) 1,1-Dichloroethane	10.73	63	1410	N.D.	
26) MethylTertButylEther(MTBE)	0.00	73	0	N.D.	
27) VinylAcetate	11.64	43	3276	N.D.	
28) 2-Butanone(MEK)	11.97	43	130	N.D.	
29) cis-1,2-Dichloroethene	12.94	96	945	N.D.	
30) Hexane	13.58	41	1066	N.D.	
31) Chloroform	13.68	83	1895	N.D.	
32) EthylAcetate	14.02	43	94	N.D.	

Page 43

(#) = qualifier out of range (m) = manual integration
09261704.D 082917.M Tue Sep 26 12:43:47 2017 Page 1

9/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261704.D Vial: 1
Acq On : 26 Sep 2017 9:24 Operator: JJG
Sample : TO15 MB 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:43 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.63	42	96	N.D.	
34) 1,2-Dichloroethane	15.34	62	1231	N.D.	
35) 1,1,1-Trichloroethane	15.87	97	1454	N.D.	
37) Benzene	16.81	78	2359	N.D.	
38) CarbonTetrachloride	17.07	117	1691	N.D.	
39) Cyclohexane	17.29	84	810	N.D.	
40) 1,2-Dichloropropane	18.31	63	1030	N.D.	
41) Bromodichloromethane	18.64	85	1184	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	18.71	130	1261	N.D.	
44) 2,2,4-Trimethylpentane	18.86	57	2720	N.D.	
45) Heptane	19.34	71	687	N.D.	
46) cis-1,3-Dichloropropene	20.06	75	1116	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	0.00	58	0	N.D.	
48) trans-1,3-Dichloropropene	20.81	75	1229	N.D.	
49) 1,1,2-Trichloroethane	20.99	97	1537	N.D.	
50) Toluene	21.35	91	2802	N.D.	
51) 2-Hexanone(MBK)	21.92	58	2913	N.D.	
52) Dibromochloromethane	21.85	129	2030	N.D.	
53) 1,2-Dibromoethane	22.15	107	2441	N.D.	
54) Tetrachloroethene(PCE)	22.75	166	2065	N.D.	
56) Chlorobenzene	23.58	114	1074	N.D.	
57) Ethylbenzene	24.05	91	3724	N.D.	
58) m&p-Xylene	24.26	106	3000	N.D.	
59) Bromoform	24.31	173	3253	N.D.	
60) Styrene	24.69	104	2742	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.81	83	5395	N.D.	
62) o-Xylene	24.82	91	3704	N.D.	
64) 4-Ethyltoluene	26.38	105	5215	N.D.	
65) 1,3,5-Trimethylbenzene	26.47	105	4599	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	4676	N.D.	
67) BenzylChloride(a-Chlorotol	27.16	91	2844	N.D.	
68) 1,3-Dichlorobenzene	27.19	146	4716	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	4945	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	5972	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	6680	N.D.	
72) Hexachlorobutadiene	31.08	225	4480	N.D.	

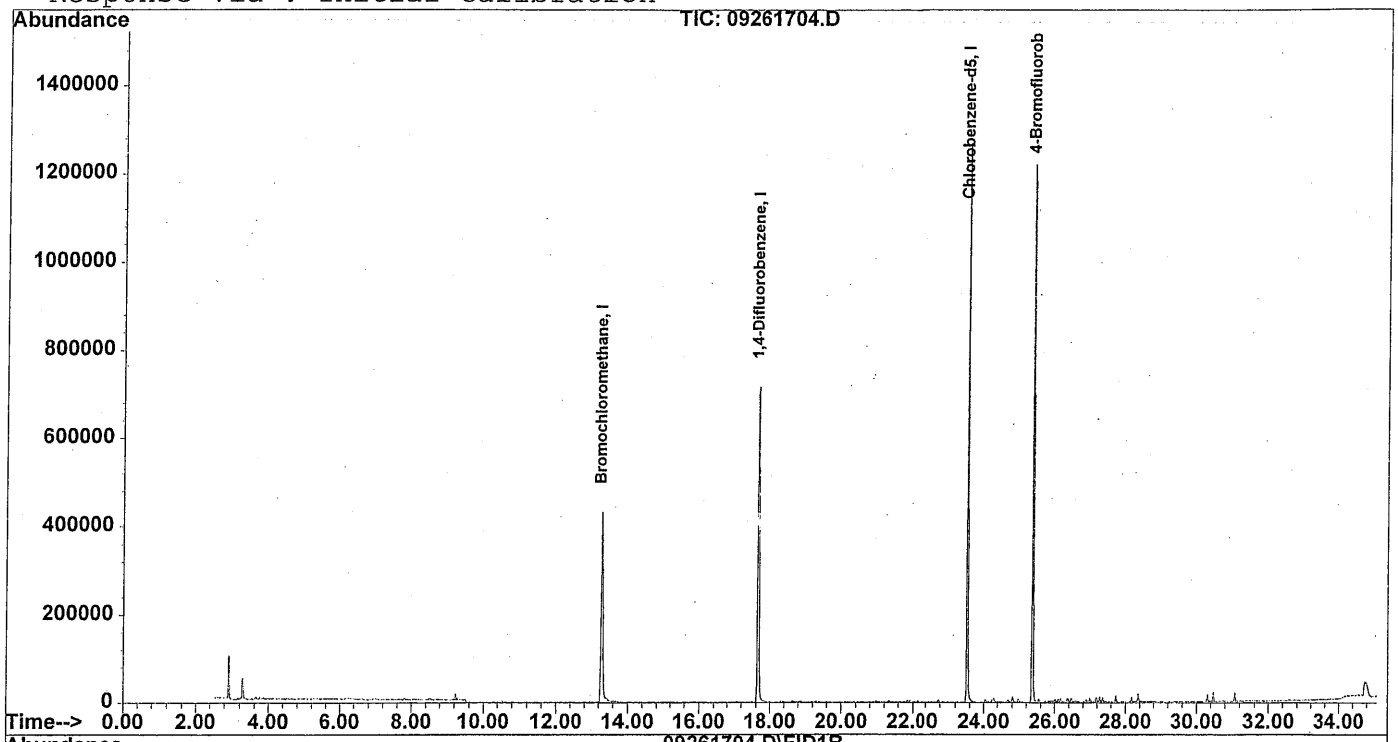
(#) = qualifier out of range (m) = manual integration
09261704.D 082917.M Tue Sep 26 12:43:48 2017 Page 2

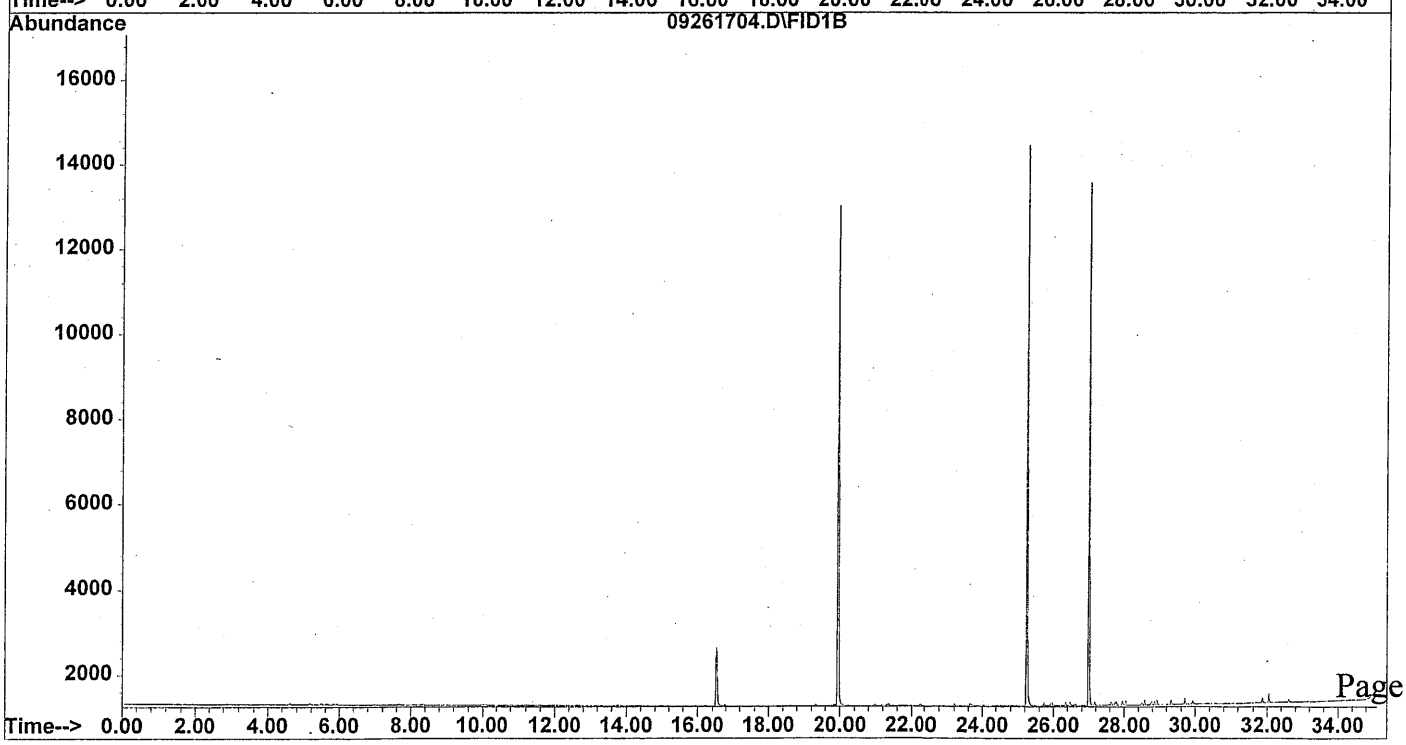
09/26/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261704.D Vial: 1
Acq On : 26 Sep 2017 9:24 Operator: JJG
Sample : TO15 MB 092617 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 500mL Multiplr: 1.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:43 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 45

08/29/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261707.D Vial: 5
Acq On : 26 Sep 2017 11:36 Operator: JJG
Sample : 171480-103452 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:49 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.30	130	284270m	10.00 ppbv	-0.04
36) 1,4-Difluorobenzene	17.66	114	919454	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	770092	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.36	174	477902	9.41 ppbv	-0.01
Spiked Amount 10.000			Recovery	= 94.10%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.20	51	898	N.D.	
3) Propene	3.23	41	335047m	444.29 ppbv	
4) Dichlorodifluoromethane	3.35	85	835	N.D.	
5) Chloromethane	3.56	52	250	N.D.	
6) Dichlorotetrafluoroethane	3.77	135	98	N.D.	
7) VinylChloride	3.90	62	208	N.D.	
8) Methanol	3.98	31	2007	N.D.	
9) 1,3-Butadiene	4.13	54	0	N.D.	
10) Bromomethane	4.52	96	105	N.D.	
11) Chloroethane	4.83	64	99	N.D.	
12) Dichlorofluoromethane	5.04	67	522	N.D.	
13) Ethanol	5.16	31	151	N.D.	
14) VinylBromide	5.40	108	258	N.D.	
15) Acetone	6.20	43	11633	N.D.	
16) Trichlorofluoromethane	6.18	103	373	N.D.	
17) 2-Propanol(IPA)	6.62	45	397	N.D.	
18) Acrylonitrile	6.83	52	96	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.81	84	1564	N.D.	
21) AllylChloride	8.06	39	638	N.D.	
22) CarbonDisulfide	8.14	76	2404	N.D.	
23) Trichlorotrifluoroethane	8.53	103	94	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.74	63	592	N.D.	
26) MethylTertButylEther(MTBE)	11.30	73	123	N.D.	
27) VinylAcetate	0.00	43	0	N.D.	
28) 2-Butanone(MEK)	12.13	43	121	N.D.	
29) cis-1,2-Dichloroethene	12.96	96	199	N.D.	
30) Hexane	13.61	41	147433	119.56 ppbv	
31) Chloroform	13.68	83	235	N.D.	
32) EthylAcetate	13.98	43	2700	N.D.	

Page 46

(#) = qualifier out of range (m) = manual integration
09261707.D 082917.M Tue Sep 26 16:53:02 2017 Page 1

09/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261707.D Vial: 5
Acq On : 26 Sep 2017 11:36 Operator: JJG
Sample : 171480-103452 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:49 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.59	42	3229	N.D.	
34) 1,2-Dichloroethane	15.31	62	100	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.81	78	555	N.D.	
38) CarbonTetrachloride	0.00	117	0	N.D.	
39) Cyclohexane	17.31	84	5722	N.D.	
40) 1,2-Dichloropropane	18.32	63	238	N.D.	
41) Bromodichloromethane	18.66	85	241	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	18.73	130	118	N.D.	
44) 2,2,4-Trimethylpentane	18.86	57	319265	69.88 ppbv	98
45) Heptane	19.34	71	3569	N.D.	
46) cis-1,3-Dichloropropene	20.06	75	263	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	20.21	58	153	N.D.	
48) trans-1,3-Dichloropropene	20.67	75	99	N.D.	
49) 1,1,2-Trichloroethane	20.99	97	107	N.D.	
50) Toluene	21.33	91	952	N.D.	
51) 2-Hexanone(MBK)	21.69	58	362	N.D.	
52) Dibromochloromethane	21.84	129	334	N.D.	
53) 1,2-Dibromoethane	22.15	107	342	N.D.	
54) Tetrachloroethene(PCE)	22.75	166	415	N.D.	
56) Chlorobenzene	23.58	114	109	N.D.	
57) Ethylbenzene	24.06	91	888	N.D.	
58) m&p-Xylene	24.29	106	493	N.D.	
59) Bromoform	24.31	173	366	N.D.	
60) Styrene	24.69	104	519	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.81	83	594	N.D.	
62) o-Xylene	24.82	91	439	N.D.	
64) 4-Ethyltoluene	26.38	105	888	N.D.	
65) 1,3,5-Trimethylbenzene	26.47	105	708	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	865	N.D.	
67) BenzylChloride(a-Chlorotol	27.16	91	504	N.D.	
68) 1,3-Dichlorobenzene	27.18	146	657	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	389	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	835	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	1210	N.D.	
72) Hexachlorobutadiene	31.08	225	602	N.D.	

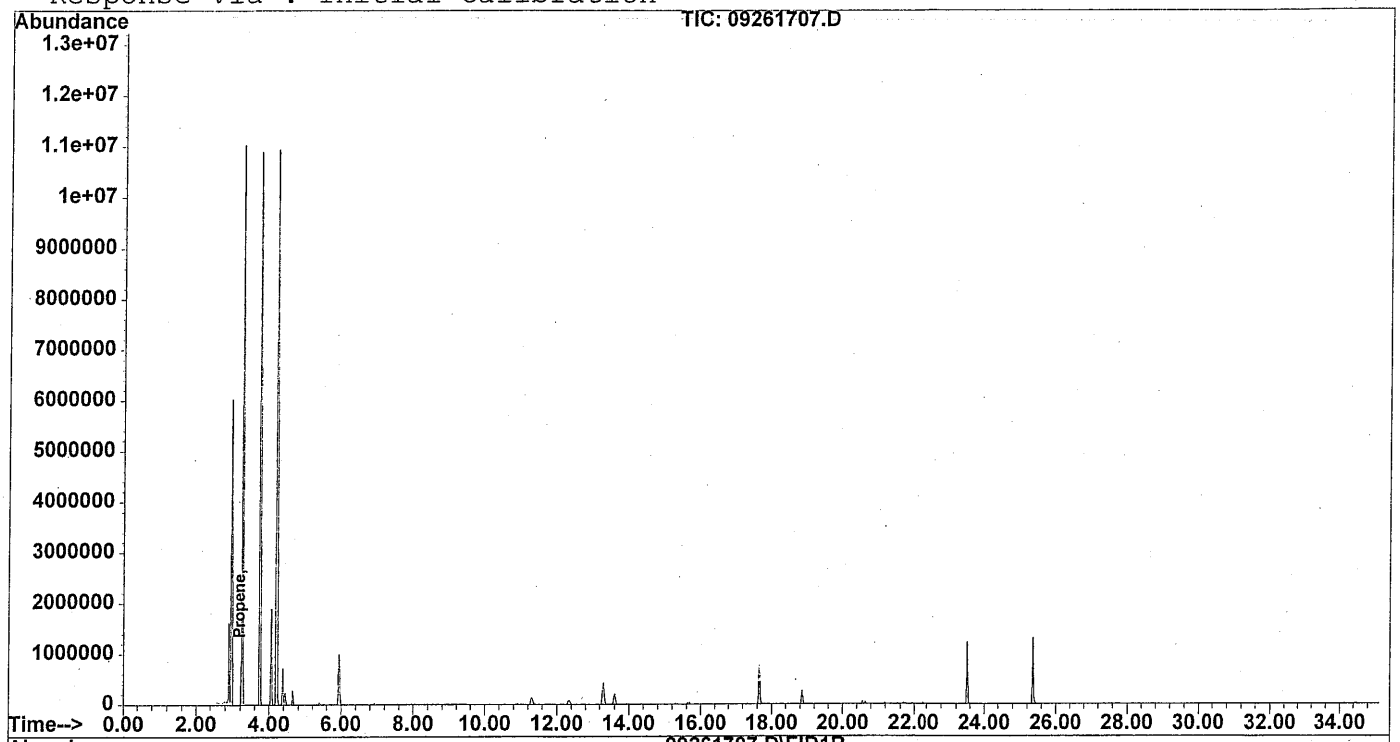
(#) = qualifier out of range (m) = manual integration
09261707.D 082917.M Tue Sep 26 16:53:03 2017

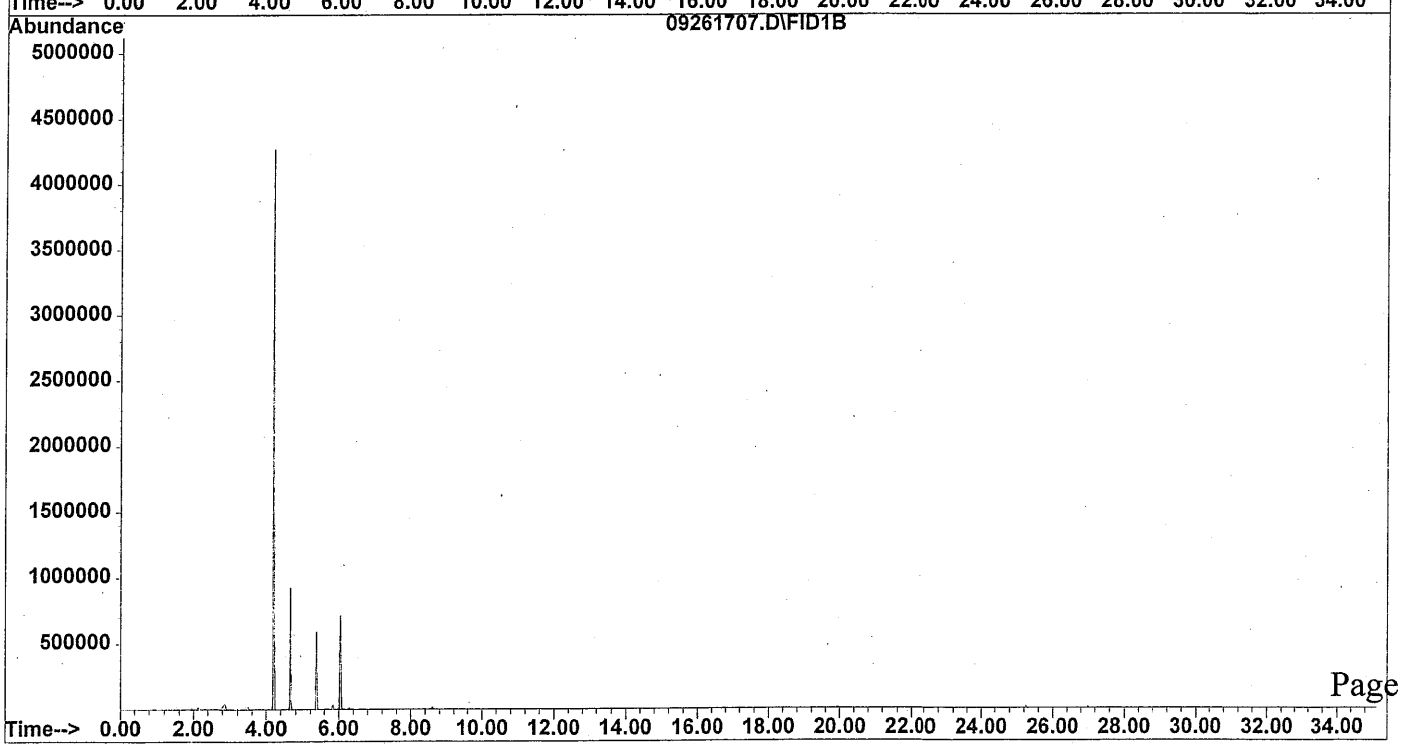
09/26/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261707.D Vial: 5
Acq On : 26 Sep 2017 11:36 Operator: JJG
Sample : 171480-103452 x20 Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 12:49 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 48

09/26/17

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261708.D Vial: 5
Acq On : 26 Sep 2017 12:26 Operator: JJG
Sample : 171480-103452 x20 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 14:10 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	13.32	130	290892	10.00 ppbv	-0.03
36) 1,4-Difluorobenzene	17.66	114	954509	10.00 ppbv	-0.03
55) Chlorobenzene-d5	23.52	117	806949	10.00 ppbv	-0.01
System Monitoring Compounds					
63) 4-Bromofluorobenzene(BFB)	25.37	174	507146	9.53 ppbv	0.00
Spiked Amount 10.000			Recovery	= 95.30%	
Target Compounds					Qvalue
2) Chlorodifluoromethane	3.22	51	282	N.D.	
3) Propene	3.25	41	368531m	477.57 ppbv	
4) Dichlorodifluoromethane	3.35	85	236	N.D.	
5) Chloromethane	0.00	52	0	N.D.	
6) Dichlorotetrafluoroethane	0.00	135	0	N.D.	
7) VinylChloride	3.92	62	157	N.D.	
8) Methanol	3.83	31	105	N.D.	
9) 1,3-Butadiene	0.00	54	0	N.D. d	
10) Bromomethane	0.00	96	0	N.D.	
11) Chloroethane	4.78	64	110	N.D.	
12) Dichlorofluoromethane	5.06	67	133	N.D.	
13) Ethanol	0.00	31	0	N.D.	
14) VinylBromide	0.00	108	0	N.D.	
15) Acetone	6.30	43	16306	N.D.	
16) Trichlorofluoromethane	6.22	103	231	N.D.	
17) 2-Propanol(IPA)	6.76	45	104	N.D.	
18) Acrylonitrile	6.81	52	102	N.D.	
19) 1,1-Dichloroethene	0.00	96	0	N.D.	
20) MethyleneChloride(DCM)	7.83	84	1847	N.D.	
21) AllylChloride	8.10	39	92	N.D.	
22) CarbonDisulfide	8.17	76	3256	N.D.	
23) Trichlorotrifluoroethane	0.00	103	0	N.D.	
24) trans-1,2-Dichloroethene	0.00	96	0	N.D.	
25) 1,1-Dichloroethane	10.76	63	216	N.D.	
26) MethylTertButylEther(MTBE)	11.35	73	94	N.D.	
27) VinylAcetate	0.00	43	0	N.D.	
28) 2-Butanone(MEK)	12.04	43	245	N.D.	
29) cis-1,2-Dichloroethene	0.00	96	0	N.D.	
30) Hexane	13.63	41	145666	115.44 ppbv	
31) Chloroform	13.85	83	99	N.D.	
32) EthylAcetate	13.98	43	2353	N.D.	

(#) = qualifier out of range (m) = manual integration
09261708.D 082917.M Tue Sep 26 16:52:47 2017 Page 1

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\MS02\2017\092617\09261708.D Vial: 5
Acq On : 26 Sep 2017 12:26 Operator: JJG
Sample : 171480-103452 x20 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 14:10 19117 Quant Results File: 082917.RES

Quant Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration
DataAcq Meth : TO15G

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
33) Tetrahydrofuran	14.78	42	95	N.D.	
34) 1,2-Dichloroethane	15.34	62	186	N.D.	
35) 1,1,1-Trichloroethane	0.00	97	0	N.D.	
37) Benzene	16.84	78	466	N.D.	
38) CarbonTetrachloride	17.09	117	143	N.D.	
39) Cyclohexane	17.31	84	4705	N.D.	
40) 1,2-Dichloropropane	18.26	63	94	N.D.	
41) Bromodichloromethane	0.00	85	0	N.D.	
42) 1,4-Dioxane	0.00	88	0	N.D.	
43) Trichloroethene(TCE)	0.00	130	0	N.D.	
44) 2,2,4-Trimethylpentane	18.86	57	315335	66.49 ppbv	98
45) Heptane	19.35	71	3634	N.D.	
46) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
47) 4-Methyl-2-pentanone(MiBK)	20.19	58	279	N.D.	
48) trans-1,3-Dichloropropene	20.74	75	97	N.D.	
49) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
50) Toluene	21.35	91	577	N.D.	
51) 2-Hexanone(MBK)	21.84	58	99	N.D.	
52) Dibromochloromethane	0.00	129	0	N.D.	
53) 1,2-Dibromoethane	0.00	107	0	N.D.	
54) Tetrachloroethene(PCE)	22.75	166	123	N.D.	
56) Chlorobenzene	23.58	114	126	N.D.	
57) Ethylbenzene	24.06	91	476	N.D.	
58) m&p-Xylene	24.29	106	239	N.D.	
59) Bromoform	24.32	173	132	N.D.	
60) Styrene	24.71	104	180	N.D.	
61) 1,1,2,2-Tetrachloroethane	24.81	83	1203	N.D.	
62) o-Xylene	24.82	91	431	N.D.	
64) 4-Ethyltoluene	26.36	105	732	N.D.	
65) 1,3,5-Trimethylbenzene	26.47	105	706	N.D.	
66) 1,2,4-Trimethylbenzene	27.00	105	1129	N.D.	
67) BenzylChloride(a-Chlorotol	27.18	91	273	N.D.	
68) 1,3-Dichlorobenzene	27.18	146	525	N.D.	
69) 1,4-Dichlorobenzene	27.28	146	579	N.D.	
70) 1,2-Dichlorobenzene	27.74	146	924	N.D.	
71) 1,2,4-Trichlorobenzene	30.31	180	779	N.D.	
72) Hexachlorobutadiene	31.08	225	1746	N.D.	

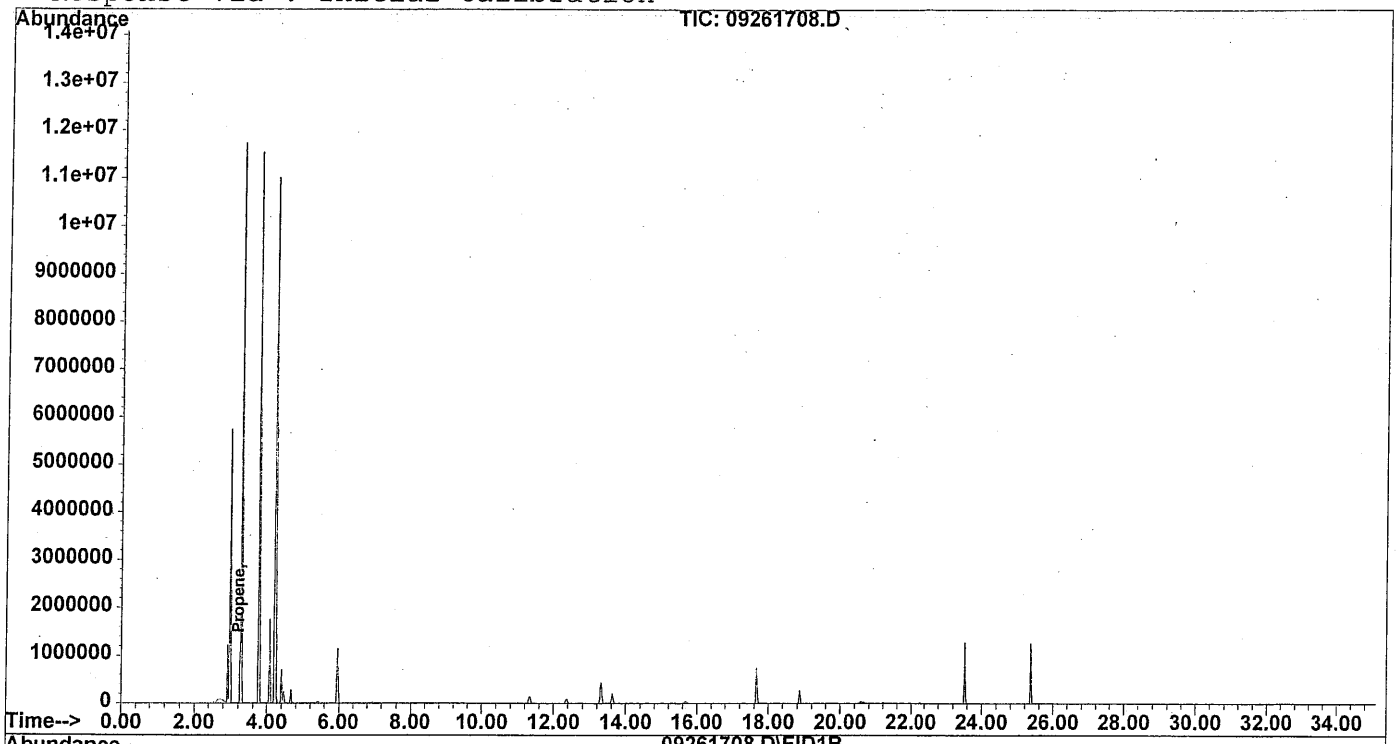
(#) = qualifier out of range (m) = manual integration
09261708.D 082917.M Tue Sep 26 16:52:47 2017 Page 2

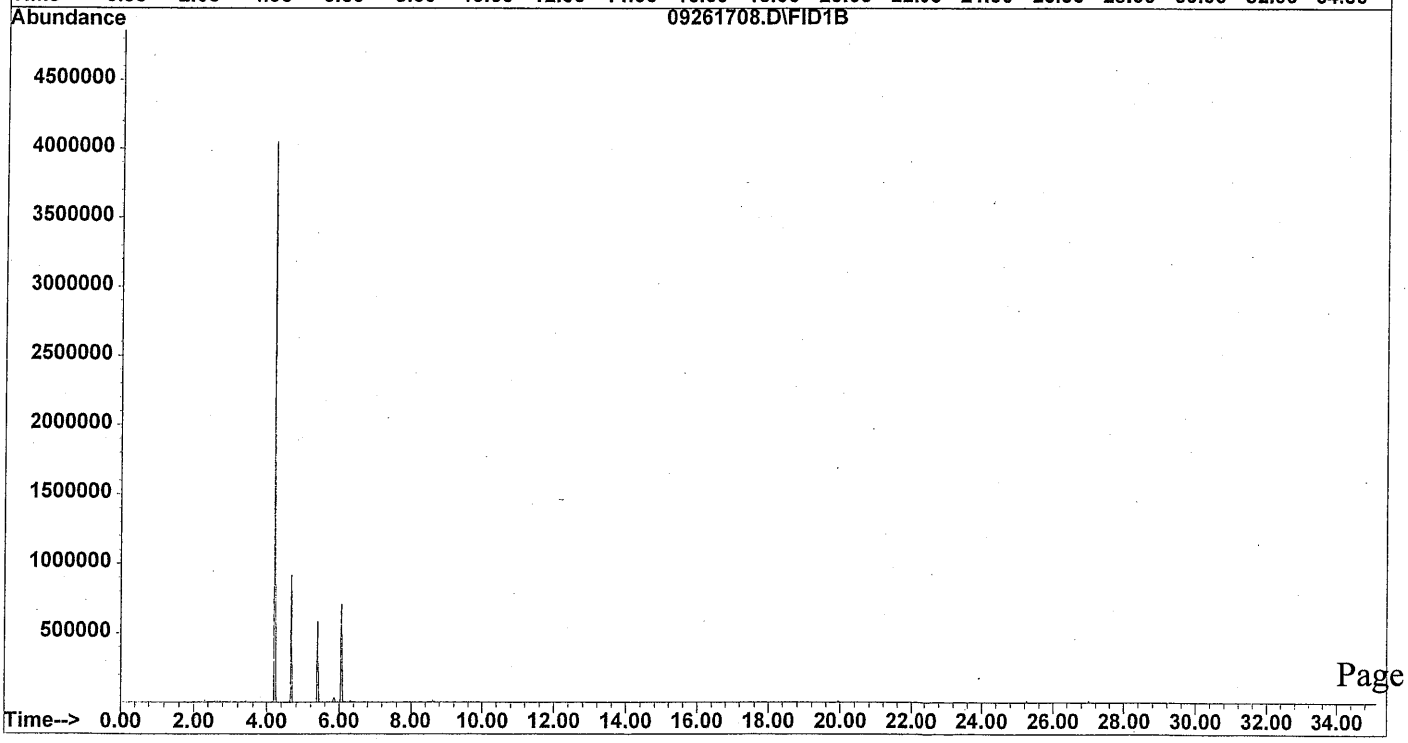
09/26/17

Quantitation Report

Data File : C:\HPCHEM\1\MS02\2017\092617\09261708.D Vial: 5
Acq On : 26 Sep 2017 12:26 Operator: JJG
Sample : 171480-103452 x20 dp Inst : GC/MS Ins
Misc : IS/Surr: PS080917-03 + 25mL Multiplr: 20.00
Sample Amount: 0.00
MS Integration Params: PAMS.P GC Integration Params: rteint2.p
Quant Time: Sep 26 14:10 19117 Quant Results File: 082917.RES

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration





Page 51

09/26/17

Calibration Status Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.5	1	10	C:\HPCHEM\1\MS02\2017\082917\08291710.D
2	1.0	1	10	C:\HPCHEM\1\MS02\2017\082917\08291709.D
3	2.0	2	10	C:\HPCHEM\1\MS02\2017\082917\08291708.D
4	5.0	5	10	C:\HPCHEM\1\MS02\2017\082917\08291707.D
5	10	10	10	C:\HPCHEM\1\MS02\2017\082917\08291706.D
6	20	21	10	C:\HPCHEM\1\MS02\2017\082917\08291705.D
7	50	52	10	C:\HPCHEM\1\MS02\2017\082917\08291704.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.5	Aug 29 21:04 2017	Aug 29 17:22 19117	29 Aug 2017 15:22
2	1.0	Aug 29 21:04 2017	Aug 29 17:02 19117	29 Aug 2017 14:38
3	2.0	Aug 29 21:04 2017	Aug 29 16:46 19117	29 Aug 2017 13:53
4	5.0	Aug 29 21:03 2017	Aug 29 14:18 19117	29 Aug 2017 13:08
5	10	Aug 29 21:03 2017	Aug 29 14:15 19117	29 Aug 2017 12:24
6	20	Aug 29 21:03 2017	Aug 29 14:12 19117	29 Aug 2017 11:39
7	50	Aug 29 21:03 2017	Aug 29 11:36 19117	29 Aug 2017 10:56

082917.M Tue Aug 29 21:13:23 2017

08/29/17

Response Factor Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

Calibration Files
0.5 =08291710.D 1.0 =08291709.D 2.0 =08291708.D
5.0 =08291707.D 10 =08291706.D 20 =08291705.D

		Compound	0.5	1.0	2.0	5.0	10	20	Avg	%RSD
1)	I	Bromochloromethane	----------ISTD----------							
2)		Chlorodifluorometha	1.585	1.806	1.603	1.585	1.656	1.686	1.614	8.01
3)		Propene	0.492	0.603	0.486	0.547	0.575	0.563	0.531	10.61
4)		Dichlorodifluoromet	2.023	2.359	1.961	2.094	2.059	1.998	2.009	11.63
5)		Chloromethane	0.195	0.233	0.182	0.187	0.196	0.222	0.199	10.21
6)		Dichlorotetrafluoro	1.158	1.484	1.237	1.203	1.209	1.234	1.219	11.61
7)		VinylChloride	0.568	0.738	0.683	0.610	0.660	0.651	0.640	9.77
8)		Methanol	0.278	0.287	0.257	0.258	0.279	0.272	0.267	6.24
9)		1,3-Butadiene	0.419	0.445	0.405	0.386	0.416	0.423	0.410	5.69
10)		Bromomethane	0.661	0.807	0.693	0.725	0.735	0.725	0.710	8.22
11)		Chloroethane	0.301	0.343	0.310	0.275	0.303	0.301	0.301	7.81
12)		Dichlorofluorometha	1.469	1.652	1.462	1.521	1.562	1.488	1.502	6.04
13)		Ethanol	0.720	0.731	0.620	0.652	0.646	0.666	0.662	7.40
14)		VinylBromide	0.686	0.694	0.629	0.642	0.675	0.702	0.665	4.76
15)		Acetone	1.207	1.222	0.979	1.157	1.041	1.124	1.128	7.86
16)		Trichlorofluorometh	1.007	1.163	1.003	1.029	1.004	0.998	1.039	5.78
17)		2-Propanol(IPA)	1.343	1.267	1.095	1.132	1.192	1.370	1.237	8.32
18)		Acrylonitrile	0.360	0.436	0.383	0.372	0.401	0.471	0.408	9.79
19)	M,T	1,1-Dichloroethene	0.606	0.607	0.543	0.546	0.710	0.676	0.614	10.05
20)	M,T	MethyleneChloride(D	0.571	0.658	0.504	0.674	0.622	0.638	0.605	9.94
21)		AllylChloride	0.567	0.665	0.617	0.644	0.646	0.692	0.640	6.15
22)		CarbonDisulfide	1.946	1.987	2.103	2.249	2.159	2.169	2.101	5.03
23)		Trichlorotrifluoroe	1.035	1.070	1.007	1.098	1.049	1.057	1.027	7.31
24)		trans-1,2-Dichloroe	0.670	0.756	0.631	0.756	0.763	0.761	0.714	8.00
25)		1,1-Dichloroethane	1.288	1.290	1.315	1.319	1.300	1.385	1.301	4.03
26)		MethylTertButylEthe	1.574	1.663	1.697	1.719	1.857	1.829	1.705	6.29
27)		VinylAcetate	2.081	2.128	2.154	2.197	2.292	2.179	2.137	5.32
28)		2-Butanone(MEK)	1.866	1.788	1.654	1.798	1.747	1.760	1.745	5.14
29)		cis-1,2-Dichloroeth	0.753	0.809	0.767	0.758	0.776	0.753	0.761	3.96
30)		Hexane	0.938	0.940	0.858	0.859	0.866	0.849	0.868	6.94
31)		Chloroform	1.467	1.749	1.508	1.613	1.534	1.531	1.532	8.58
32)		EthylAcetate	1.971	1.948	1.975	1.932	2.010	1.958	1.933	4.60
33)		Tetrahydrofuran	0.943	0.987	0.773	0.824	0.843	0.799	0.846	10.33
34)		1,2-Dichloroethane	0.931	1.131	0.953	1.024	1.032	1.036	1.005	7.27
35)		1,1,1-Trichloroetha	1.415	1.478	1.379	1.357	1.482	1.405	1.400	4.88
36)	I	1,4-Difluorobenzene	----------ISTD----------							
37)	T,M	Benzene	0.572	0.646	0.641	0.666	0.586	0.614	0.609	7.51
38)		CarbonTetrachloride	0.458	0.511	0.512	0.496	0.485	0.477	0.477	8.17
39)		Cyclohexane	0.217	0.283	0.256	0.258	0.254	0.233	0.244	10.70
40)		1,2-Dichloropropane	0.259	0.268	0.287	0.276	0.282	0.258	0.264	8.78
41)		Bromodichloromethan	0.338	0.387	0.367	0.341	0.349	0.347	0.344	9.42
42)		1,4-Dioxane	0.174	0.188	0.179	0.166	0.165	0.159	0.168	8.43

(#) = Out of Range ### Number of calibration levels exceeded format ###
082917.M Tue Aug 29 21:13:40 2017 Page 1

8/29/17

Response Factor Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\2017\082917.M (RTE Integrator)
Title : TO-15/TO-14
Last Update : Tue Aug 29 21:06:31 2017
Response via : Initial Calibration

Calibration Files
0.5 =08291710.D 1.0 =08291709.D 2.0 =08291708.D
5.0 =08291707.D 10 =08291706.D 20 =08291705.D

		Compound	0.5	1.0	2.0	5.0	10	20	Avg	%RSD
43)	M,T	Trichloroethene(TCE	0.357	0.365	0.394	0.368	0.354	0.337	0.349	10.99
44)		2,2,4-Trimethylpent	1.026	1.067	0.986	1.086	1.030	0.959	0.994	9.49
45)		Heptane	0.158	0.187	0.199	0.170	0.165	0.166	0.169	11.38
46)		cis-1,3-Dichloropro	0.377	0.405	0.427	0.401	0.375	0.396	0.387	8.27
47)		4-Methyl-2-pentanon	0.255	0.254	0.264	0.264	0.248	0.238	0.248	6.95
48)		trans-1,3-Dichlorop	0.368	0.392	0.405	0.376	0.405	0.388	0.381	6.72
49)		1,1,2-Trichloroetha	0.303	0.332	0.344	0.341	0.318	0.279	0.307	13.22
50)	M,T	Toluene	0.690	0.750	0.785	0.836	0.755	0.682	0.725	11.55
51)		2-Hexanone(MBK)	0.296	0.356	0.343	0.327	0.293	0.301	0.309	11.87
52)		Dibromochloromethan	0.662	0.785	0.796	0.794	0.685	0.698	0.709	13.15
53)		1,2-Dibromoethane	0.599	0.639	0.624	0.609	0.614	0.565	0.585	11.38
54)	M,T	Tetrachloroethene(P	0.454	0.476	0.522	0.541	0.489	0.445	0.463	16.07
55)	I	Chlorobenzene-d5	----------ISTD----------							
56)	M,T	Chlorobenzene	0.263	0.297	0.272	0.289	0.251	0.253	0.263	10.21
57)	M,T	Ethylbenzene	1.185	1.414	1.248	1.197	1.125	1.110	1.175	12.10
58)	M,T	m&p-Xylene	0.448	0.588	0.476	0.418	0.417	0.395	0.434	20.44
59)		Bromoform	0.829	1.059	0.928	0.827	0.815	0.761	0.824	18.84
60)		Styrene	0.689	0.807	0.756	0.735	0.705	0.645	0.706	9.57
61)		1,1,2,2-Tetrachloro	0.888	1.061	0.894	0.842	0.787	0.693	0.818	19.48
62)	M,T	o-Xylene	0.985	1.137	0.992	0.902	0.836	0.786	0.897	18.04
63)	SR	4-Bromofluorobenzen	0.664	0.731	0.611	0.632	0.676	0.611	0.660	6.74
64)		4-Ethyltoluene	1.417	1.643	1.399	1.416	1.310	1.213	1.337	15.73
65)		1,3,5-Trimethylbenz	1.079	1.283	1.090	1.144	1.044	1.029	1.062	14.79
66)		1,2,4-Trimethylbenz	1.093	1.268	1.052	1.173	1.059	0.947	1.056	14.32
67)		BenzylChloride(a-Ch	1.012	1.178	1.023	1.003	0.915	0.842	0.956	15.32
68)		1,3-Dichlorobenzene	0.918	1.128	0.999	0.944	0.875	0.796	0.899	17.48
69)		1,4-Dichlorobenzene	0.931	1.050	1.009	0.919	0.886	0.859	0.908	12.39
70)		1,2-Dichlorobenzene	0.935	1.016	0.943	0.846	0.891	0.791	0.875	11.97
71)		1,2,4-Trichlorobenz	0.751	0.879	0.884	0.867	0.862	0.770	0.804	12.32
72)		Hexachlorobutadiene	0.686	0.779	0.748	0.756	0.702	0.618	0.674	17.86

(#) = Out of Range ### Number of calibration levels exceeded format ###
082917.M Tue Aug 29 21:13:42 2017 Page 2

8/29/17

Standard
CERTIFICATION

THE LINDE GROUP

Linde

SHIPPED TO: Atmospheric Analysis
1534 Eastman Ave. Suite A
Ventura, CA 93003

PAGE: 1 of 3

SS0996

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Propylene	115-07-1	1.00 ppm	1.09 ppm
Freon-12	75-71-8	1.00 ppm	1.06 ppm
Chloromethane	74-87-3	1.00 ppm	1.03 ppm
Freon-114	76-14-2	1.00 ppm	1.00 ppm
Vinyl Chloride	75-01-4	1.00 ppm	1.01 ppm
1,3-Butadiene	106-99-0	1.00 ppm	1.05 ppm
Bromomethane	74-83-9	1.00 ppm	1.00 ppm
Chloroethane	75-00-3	1.00 ppm	0.97 ppm
Ethanol (Analytical Accuracy ± 10%)	64-17-5	1.00 ppm	0.91 ppm
Acrolein (Analytical Accuracy ± 10%)	107-02-8	1.00 ppm	1.01 ppm
Acetone	67-64-1	1.00 ppm	1.06 ppm
Freon-11	75-69-4	1.00 ppm	1.04 ppm
Isopropyl Alcohol	67-63-0	1.00 ppm	1.08 ppm
1,1-Dichloroethene	75-35-4	1.00 ppm	1.08 ppm
Carbon Disulfide (Analytical Accuracy ± 10%)	75-15-0	1.00 ppm	1.00 ppm
Methylene Chloride	75-09-2	1.00 ppm	1.05 ppm
Freon-113	76-13-1	1.00 ppm	1.07 ppm
Trans-1,2-Dichloroethene	156-60-5	1.00 ppm	1.01 ppm
1,1-Dichloroethane	75-34-3	1.00 ppm	1.05 ppm
Methyl Tert Butyl Ether	1634-04-4	1.00 ppm	1.06 ppm
Vinyl Acetate	108-05-4	1.00 ppm	1.08 ppm
Methyl Ethyl Ketone	78-93-3	1.00 ppm	1.06 ppm
Cis-1,2-Dichloroethene	156-59-2	1.00 ppm	1.06 ppm
Hexane	110-54-3	1.00 ppm	1.05 ppm
Chloroform	67-66-3	1.00 ppm	1.09 ppm
Ethyl Acetate	141-78-6	1.00 ppm	1.09 ppm
Tetrahydrofuran	109-99-9	1.00 ppm	1.05 ppm
1,2-Dichloroethane	107-06-2	1.00 ppm	1.06 ppm
1,1,1-Trichloroethane	71-55-6	1.00 ppm	1.06 ppm
Benzene	71-43-2	1.00 ppm	1.04 ppm

Linde Gas North America LLC

(908) 329-9700 Main (908) 329-9740 Fax
www.Lindeus.com

THE LINDE GROUP

SHIPPED TO: Atmospheric Analysis
1534 Eastman Ave. Suite A
Ventura, CA 93003

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Carbon Tetrachloride	56-23-5	1.00 ppm	1.08 ppm
Cyclohexane	110-82-7	1.00 ppm	1.05 ppm
1,2-Dichloropropane	78-87-5	1.00 ppm	1.05 ppm
Trichloroethylene	79-01-6	1.00 ppm	1.04 ppm
Bromodichloromethane	75-27-4	1.00 ppm	1.04 ppm
1,4-Dioxane	123-91-1	1.00 ppm	1.04 ppm
Methyl Methacrylate	80-62-6	1.00 ppm	1.04 ppm
Heptane	142-82-5	1.00 ppm	1.04 ppm
Cis-1,3-Dichloropropene	10061-01-5	1.00 ppm	1.07 ppm
Methyl Isobutyl Ketone	108-10-1	1.00 ppm	1.00 ppm
Trans-1,3-Dichloropropene	10061-02-6	1.00 ppm	1.00 ppm
1,1,2-Trichloroethane	79-00-5	1.00 ppm	1.04 ppm
Toluene	108-88-3	1.00 ppm	1.06 ppm
Methyl Butyl Ketone	591-78-6	1.00 ppm	1.08 ppm
Dibromochloromethane	124-48-1	1.00 ppm	0.99 ppm
1,2-Dibromoethane	106-93-4	1.00 ppm	1.04 ppm
Tetrachloroethylene	127-18-4	1.00 ppm	1.03 ppm
Chlorobenzene	108-90-7	1.00 ppm	1.05 ppm
Ethylbenzene	100-41-4	1.00 ppm	1.05 ppm
p-xylene	106-42-3	1.00 ppm	1.00 ppm
m-xylene	108-38-3	1.00 ppm	1.00 ppm
Bromoform	75-25-2	1.00 ppm	1.04 ppm
Styrene	100-42-5	1.00 ppm	1.03 ppm
o-xylene	95-47-6	1.00 ppm	1.04 ppm
1,1,2,2-Tetrachloroethane	79-34-5	1.00 ppm	1.04 ppm
4-Ethyltoluene	622-96-8	1.00 ppm	1.00 ppm
1,3,5-Trimethylbenzene	108-67-8	1.00 ppm	1.00 ppm
1,2,4-Trimethylbenzene	95-63-6	1.00 ppm	0.99 ppm

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CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103596
Certification Date:	Nov-12-2016	**Cylinder Pressure:**	1100 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	63 Liters
Expiration Date:	Nov-12-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
1,3-Dichlorobenzene	541-73-1	1.00 ppm	0.96 ppm
Benzyl Chloride (Analytical Accuracy ± 10%)	100-44-7	1.00 ppm	0.96 ppm
1,4-Dichlorobenzene	106-46-7	1.00 ppm	0.98 ppm
1,2-Dichlorobenzene	95-50-1	1.00 ppm	0.97 ppm
1,2,4-Trichlorobenzene	120-82-1	1.00 ppm	0.88 ppm
Naphthalene (Analytical Accuracy ± 10%)	91-20-3	1.00 ppm	0.91 ppm
Hexachloro-1,3-Butadiene	87-68-3	1.00 ppm	0.93 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Nov-12-2016

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PAGE: 1 of 1

SS0997

CERTIFICATE OF ANALYSIS

Sales#:	114552944	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3071860	**Cylinder # :**	AB-103808
Certification Date:	Nov-11-2016	**Cylinder Pressure:**	1000 psig
P.O.# :	Verbal-Recert	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	58 Liters
Expiration Date:	Nov-11-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Chlorodifluoromethane	75-45-6	1.00 ppm	1.04 ppm
Acetaldehyde (Analytical Accuracy ± 10%)	75-07-0	2.00 ppm	2.19 ppm
Methanol (Analytical Accuracy ± 10%)	67-56-1	2.00 ppm	1.90 ppm
Dichlorofluoromethane	75-43-4	1.00 ppm	1.06 ppm
Vinyl Bromide	593-60-2	1.00 ppm	1.01 ppm
Acrylonitrile (Analytical Accuracy ± 10%)	107-13-1	1.00 ppm	1.15 ppm
Tert Butanol (Analytical Accuracy ± 10%)	75-65-0	1.00 ppm	1.10 ppm
Allyl Chloride	107-05-1	1.00 ppm	1.10 ppm
2,2,4-Trimethylpentane	540-84-1	1.00 ppm	1.03 ppm
Cumene	98-82-8	1.00 ppm	0.97 ppm
alpha-Pinene (No Stability Guarantee)	7785-70-8	1.00 ppm	1.10 ppm
o-Chlorotoluene	95-49-8	1.00 ppm	1.02 ppm
n-Propylbenzene	103-65-1	1.00 ppm	0.97 ppm
beta-Pinene (No Stability Guarantee)	127-91-3	1.00 ppm	1.09 ppm
Sec-Butyl Benzene	135-98-8	1.00 ppm	0.98 ppm
n-Butyl Benzene	104-51-8	1.00 ppm	0.98 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Nov-11-2016

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PAGE: 1 of 1

SS1002

CERTIFICATE OF ANALYSIS

Sales#:	114722347	**Cylinder Size:**	185 (3.2" X 9.4")
Production#:	3074830	**Cylinder # :**	AB-102969
Certification Date:	Dec-30-2016	**Cylinder Pressure:**	500 psig
P.O.# :	Marcus Hueppe	**Cylinder Valve:**	CGA 180 / Aluminum
Blend Type:	CERTIFIED	**Cylinder Volume:**	0.8 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	29 Liters
Expiration Date:	Dec-30-2017	**Blend Tolerance:**	10% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	5% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
1,2,3-Trichloropropane	96-18-4	1.00 ppm	1.00 ppm
1,2-Dibromo-3-Chloropropane	96-12-8	1.00 ppm	0.93 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti

DATE: Dec-30-2016

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CleanAir

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LABORATORY ANALYSIS FOR METHANE AND ETHANE
Laboratory Services Report No: 64-29570_GC_METHANE AND ETHANE_V0

Performed for:
CLEAN AIR PALATINE SOURCE GROUP

Pertaining to a Field Sampling Project Performed for:
SIMS METAL MANAGEMENT

Customer Reference No: 13318
Laboratory Services Project No: 29570
Revision 0: 10/18/2017

To the best of our knowledge, the laboratory report nor the results provided have in any way been reproduced or altered except in full without prior written approval of the lab. The laboratory results presented in this report are accurate, complete, error free, legible and representative of the samples per the analysis described here-in. The lab retains the unaltered final copy for comparison purposes upon request.

Submitted by,

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Date: 2017.10.18 13:42:04 -05'00'

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REVISION HISTORY

LABORATORY ANALYSIS FOR METHANE AND ETHANE
Laboratory Services Report NO: 64-29570_GC_METHANE AND ETHANE_V0

FINAL REPORT REVISION HISTORY

Revision:	Date	Pages	Comments
0	10/18/2017	All	Final version of original document.

CONTENTS

1 CERTIFICATE OF ANALYSIS 1-1

2 ANALYTICAL CASE NARRATIVE 2-1
INTRODUCTION 2-1
Key Project Participants 2-1
Table 2-2: Pertinent Personnel 2-1
Accreditation 2-1
Table 2-3: Specific Accreditations and Expiration Dates 2-1
DISCUSSION OF ANALYTICAL RESULTS 2-2

3 METHODOLOGY 3-1
Table 3-2: List of Analytical Methodology 3-1
Analytical Procedures Common To All Methods 3-2
Sample Preparation 3-2
Sample Analysis 3-2
Table 3-3: List of Sample Loops 3-2
Figure 3-4: Schematic Diagram of the 10 Port Sampling Valve 3-3
Table 3-5: List of Analytes 3-4
Detection Limits 3-4
Instrument Calibration 3-5
Quality Control Procedures 3-5
Standard and Reagent Traceability 3-7
Project Archival 3-7

4 APPENDIX 4-1
SAMPLE CALCULATIONS I
RAW DATA II
QUALITY ASSURANCE RECORDS III
CHAIN-OF-CUSTODY DOCUMENTATION IV
DETECTION LIMIT DETERMINATION DATA V
EQUIPMENT CALIBRATION RECORDS VI
STANDARD PREPARATION RECORDS VII
BATCH LOG SHEETS VIII
CHROMATOGRAMS IX

CERTIFICATE OF ANALYSIS

Sample Number	Sample ID	Spike/Recovery Corrected Concentration of Analyte in Sample (ppmv) Methane	Ethane
29570-001	Run 1 - TTE Exhaust Duct	4.80	0.87 †
29570-002	Run 2 - TTE Exhaust Duct	††	††
29570-003	Run 3 - TTE Exhaust Duct	5.13	1.10 †
29570-004	Run 4 - TTE Exhaust Duct	4.86	<
29570-005	Run 5 - TTE Exhaust Duct	5.30	1.95
29570-006	Run 6 - TTE Exhaust Duct	4.82	1.30 †
Method Detection Limit (MDL)		1.63	0.23
Limit of Quantitation (LOQ)		3.06	1.53

Note: Results below the MDL are reported as "<" where appropriate.

† - Values were quantified using the calibration curve. The peak areas are considered to be readily quantifiable, therefore these values are believed to be accurate. However, as the concentrations are below the Limit of Quantitation (LOQ), they should be used with some discretion.

†† - Sample did not pass Spike/Recovery Check. See discussion for further details.

End of Section 1 – Certificate of Analysis

ANALYTICAL CASE NARRATIVE

INTRODUCTION

Clean Air Palatine Source Group contracted Clean Air Engineering Laboratory Services (Laboratory Services) to determine the following:

- Gaseous Organics – Methane and Ethane

All analyses were performed on samples received by the Laboratory Services at their facility in Palatine, IL. All analyses were performed in accordance with the applicable EPA Method requirements along with all NELAP quality requirements as outlined and described in Section 3 of this report.

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Key Project Participants

Samples were received at Clean Air Engineering Laboratory Services facility over two days beginning on 09/25/2017. The following is a table of key personnel involved:

Table 2-2:
Pertinent Personnel

Technician	Affiliation	Function
E. Doak	Customer	COC Relinquished
D. Rhoades	Laboratory Services	Sample Receipt
J. McKeever/S. Brown	Customer	Project Manager

Accreditation

Clean Air Laboratory Services is accredited through the following state agencies.

Table 2-3:
Specific Accreditations and Expiration Dates

State	Certificate Number	Expiration Date
Texas	T104704431-17-8	8/31/2018
Louisiana	5009	6/30/2018

Please visit the respective state websites to view our current accreditation status and a comprehensive list of our accredited services.

DISCUSSION OF ANALYTICAL RESULTS

Method 18 calls for the sample results to be corrected based on the results of the recovery study. For the bag sampling technique to be considered valid for a compound, the recovery must be between 70% < R < 130%. Table 2-4, below, lists the recovery percentages for each spiked sample.

Table 2-4:
Spike Recovery for Each Spiked Sample

Sample Number	Identification	Methane Spike Recovery	Ethane Spike Recovery
29570-001	Run 1 - TTE Exhaust Duct	98.6%	94.9%
29570-002	Run 2 - TTE Exhaust Duct	12.7%	<
29570-003	Run 3 - TTE Exhaust Duct	93.3%	92.5%
29570-005	Run 5 - TTE Exhaust Duct	98.6%	94.8%

Sample 29570-002 did not pass the spike/recovery requirements. This sample was noted as appearing 'flat' at the time of receipt in the laboratory. All other spiked samples had a recovery above 90% for both compounds.

End of Section 2 – Analytical Case Narrative

METHODOLOGY

3-1

Laboratory Services followed procedures as detailed in U.S. EPA Method 18. Table 3-2, below summarizes the methods and their respective sources.

Table 3-2:
List of Analytical Methodology

Title 40 CFR Part 60 Appendix A	
U.S. EPA Method 18	"Measurement of Gaseous Organic Compound Emissions by Gas Chromatography"

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR) and are located on the internet at http://ecfr.gpoaccess.gov.

Laboratory Services followed specific quality assurance and quality control (QA/QC) procedures as outlined in the individual methods and as prescribed in Laboratory Services' internal Quality Manual. Results of recorded QA/QC activities performed by Laboratory Services are summarized in Appendix III.

Analytical Procedures Common To All Methods

Sample Preparation

- Samples were prepared according to the procedures listed in the EPA Method above. Each sample was analyzed at full strength and a dilution was prepared if necessary to achieve a concentration that was within calibration range limits.

Sample Analysis

- EPA Method 18 is a generic method for measuring gaseous organic compounds. The method is based on separating the major organic components of a gaseous mixture using a gas chromatograph (GC) and measuring them with a suitable detector.
- To identify and quantify the major components, the retention times of each separated component are compared with those of known compounds under identical conditions. The analyst identifies approximate concentrations of the organic emission components beforehand. With this information, standard mixtures are prepared and the GC is calibrated under physical conditions identical to those used for the samples.
- A SRI 8610 GC equipped with a heated ten-port gas sampling valve (VICI two-position) was used to acquire sample onto a continuously purged sample loop. At initiation of each injection (analysis), the valve is actuated to the 'inject' position and sample is flushed onto the column and onto an appropriate detector. The instrument's gas sampling valve is fitted with two sample loops. Table 3-3 lists the sample loops were used for this project:

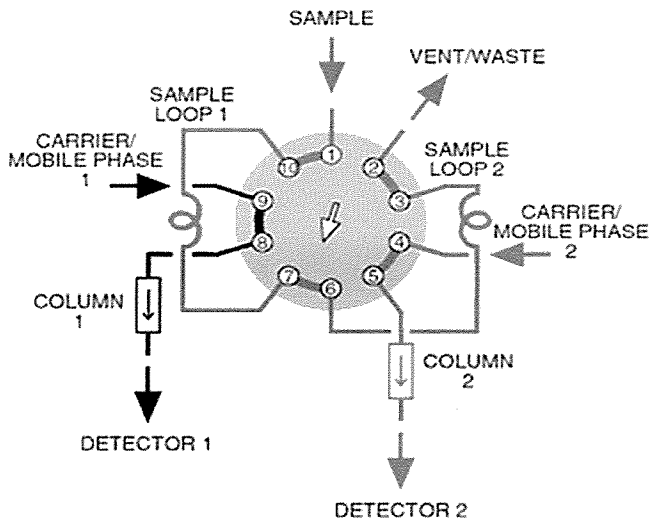
Table 3-3:
List of Sample Loops

Loop	Material	Length (in)	Volume (μL)	Connected to Column	Detector
1	1/16" Sulfinert Coated SS	96	2000	Double Super Q	FID

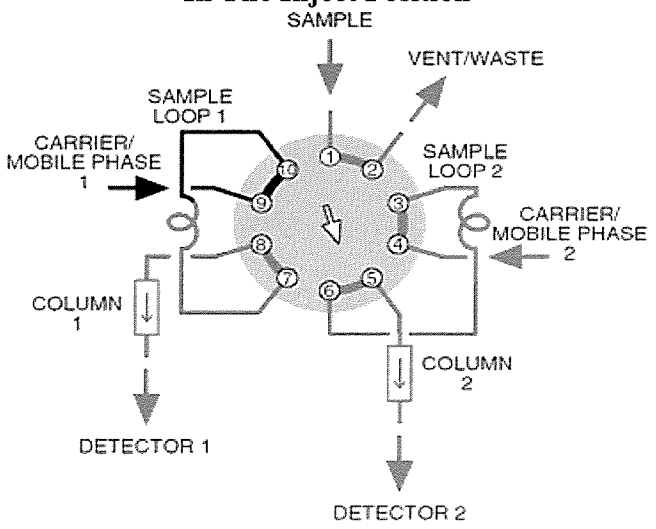
- Sample acquired in Loop 1 is flushed onto two Super Q columns for separation of analytes. Analytes are quantified using an FID detector.
- A schematic of the 10 port sampling valve is shown in Figure 3-4 on the following page.

Figure 3-4:
Schematic Diagram of the 10 Port Sampling Valve

In The Load Position



In The Inject Position



- The list of analytes can be found in Table 3-5. The appropriate sample loop, GC column, and detector are also listed for each analyte.
-

Table 3-5:
List of Analytes

Compound Order of Elution	Compound	CAS Number	Molecular Weight (g/mole)	Sample Loop	Column	Detector
Compound 1	Methane	74-82-8	16.04	1	Double Super Q	FID
Compound 2	Ethane	74-84-0	30.07	1	Double Super Q	FID

Detection Limits

- The Method Detection Limit (MDL) was determined in accordance with procedures in 40 CFR 136, Appendix B. Documentation showing the determination of detection limits is included with this report. The Limit of Quantitation (LOQ) is set to be the concentration of the lowest calibration point for each analyte. Values between these limits were quantified, but should be used with discretion as they were below the LOQ. Values that were below the MDL were indicated by a "<" where appropriate

Instrument Calibration

- Instrument calibration followed regulations found in U.S. EPA Method 18.
- Calibration bags were prepared from calibration gas cylinders that are certified to an accuracy of 2% or better and/or from pure compounds diluted in zero nitrogen.
- As per section U.S EPA Method 18, a series of at least 3 standards were prepared and analyzed in triplicate from lowest to highest concentration.
- The average peak area for each calibration point is plotted against the expected concentration.
- In accordance with EPA Performance Specification 9, a least-squares regression with an R^2 value of 0.995 or greater must be produced from the resulting curve.
- In accordance with U.S. EPA Method 18, a full post-test calibration was performed. The pre-test and post-test calibration average peak area for any standard must agree within 5% of any observed area.
- At the beginning and end of each analysis day, a single injection of a calibration point was analyzed to verify instrument calibration.

Quality Control Procedures

Clean Air adheres to QA/QC procedures that both meet and exceed EPA requirements.

- Before the first sample was analyzed and every twenty samples thereafter, a Quality Control (QC) sample was analyzed. The QC sample was prepared from a different traceable gas cylinder than the calibration standards and the CCV. The QC must show a regression concentration within 10 percent of the expected concentration.
- After the first ten samples and every twenty thereafter (and before the post-test calibration) a laboratory blank and a Continuing Calibration Verification (CCV) were analyzed. The CCV was prepared from the same calibration standard as used to create the standards that make up the calibration curve. The laboratory blank must show a regression concentration of zero, and the CCV must show a regression concentration within 10 percent of the expected concentration.
- Every sample was analyzed in triplicate and the average area count used to determine the concentration. Each measured area count must not have a relative difference of more than five percent of the average area count for the three injections. In the event that the relative difference is more than five percent, the sample was reanalyzed until a relative difference of less than five percent is obtained.
- Each point on the calibration curve should be within ± 2 percent of the calibration span of the curve used.
- The observed concentration value of each point on the calibration curve should have a relative percent difference of 10 percent from its expected concentration.

METHODOLOGY

- Paragraph 8.4.2.1 of EPA Method 18 discusses the required procedures for performing a spike and recovery study. The paragraph suggests spiking a bag with a known mixture (gaseous or liquid) of all the target pollutants. The theoretical concentration, in ppm, of each spiked compound in the bag shall be 40% to 60% of the average concentration measured in the three bag samples. If a target compound was not detected in the bag samples, the concentration of that compound to be spiked shall be five times the limit of detection for that compound.
    - For this project, 1/3 of all samples were spiked with pure compound.
    - As the sample volume contained in each spiked bag is not known, an expected spike concentration would be difficult to estimate. Instead, the bags were spiked, mechanically mixed and analyzed within an hour of spiking. The results of this analysis are used to determine the pre-rest concentration for each spiked bag. Each of these spiked bags must then rest the same amount of time as elapsed between sampling and the original analysis. For the bag sampling technique to be considered valid for a compound, the recovery must be between 70% < R < 130%. Table 3-6, below, shows the sampling and analysis dates for all samples.

Table 3-6:
Sampling and Analysis Dates for Each Sample

Sample Number	Identification	Sample Date	Analysis Date	Number of Days	Spike Origination Date	Spike Final Analysis Date	Number of Days
29570-001	Run 1 - TTE Exhaust Duct	09/15/17	09/27/17	12	09/29/17	10/12/17	13
29570-002	Run 2 - TTE Exhaust Duct	09/15/17	09/27/17	12	09/29/17	10/12/17	13
29570-003	Run 3 - TTE Exhaust Duct	09/18/17	09/27/17	9	09/29/17	10/12/17	13
29570-004	Run 4 - TTE Exhaust Duct	09/18/17	09/27/17	9			
29570-005	Run 5 - TTE Exhaust Duct	09/20/17	09/27/17	7	09/29/17	10/12/17	13
29570-006	Run 6 - TTE Exhaust Duct	09/20/17	09/27/17	7			

Standard and Reagent Traceability

- Each calibration standard has been prepared in accordance with U.S. EPA Method 18 and has been designated an original lot number. This number can be used to trace back to the original cylinders or reagents used in the preparation of these standards. These lot numbers are found in the Appendix.

Project Archival

- A copy of this report and all associated supporting records will be archived and stored for at least 20 years.
- All samples are archived for a period of one year from the date of receipt in our facility with the following exceptions:
    - Tedlar bag gas chromatography samples are generally discarded within 30 days following the analysis.
- The archival facility is a controlled access storage facility that does not incorporate any environmental controls.

End of Section 3 – Methodology

APPENDIX

4-1

SAMPLE CALCULATIONS I
RAW DATA II
QUALITY ASSURANCE RECORDS III
CHAIN-OF-CUSTODY DOCUMENTATION IV
DETECTION LIMIT DETERMINATION DATA V
EQUIPMENT CALIBRATION RECORDS VI
STANDARD PREPARATION RECORDS VII
BATCH LOG SHEETS VIII
CHROMATOGRAMS IX

SAMPLE CALCULATIONS

i

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

1. Average of all area count values for a given calibration point.

$$\overline{X} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Variable	Description	Example
$\overline{X}$	Average of all area count values for a given calibration point.	15.51
x_i	Individual area count values for each individual injection.	15.93
i	Iteration value.	15.68
n	Number of injections for the calibration point under question.	6

2. Determination of Standard Deviation of Area Counts.

$$\sigma_{s\_i} = \sqrt{\frac{\sum_{i=1}^{n} (Area_{Trial\_i} - Area_{avg})^2}{n}}$$

Variable	Description	Example
$Area_{Trial\_i}$	Area Counts for each iteration	6.289
$Area_{avg}$	Average Area Counts	6.357
n	Number of Iterations	6
σ_{s_i}	Standard Deviation for Area Counts	0.148

3. Determination of Percent RSD.

$$\%RSD = \frac{(\sigma_{s\_i})(100)}{Area_{avg}}$$

Variable	Description	Example
σ_{s_i}	Standard Deviation for Area Counts	0.148
100	Conversion Constant from decimal to percent (%)	100
$Area_{avg}$	Average Area Counts	6.357
% RSD	Percent RSD (%)	2%

4. Determination of Method 18 Quality Parameters for Maximum.

$$Q_{Max} = \frac{(Area_{Max} - Area_{avg})(100)}{Area_{avg}}$$

Variable	Description	Example
$Area_{Max}$	Maximum Area Counts Iterations	6.542
$Area_{avg}$	Average Area Counts	6.357
100	Conversion Constant from decimal to percent (%)	100
Q_{Max}	Method 18 Quality Parameters for Maximum	2.92%

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

5. Determination of Method 18 Quality Parameters for Minimum.

$$Q_{Min} = \frac{(Area_{avg} - Area_{Min})(100)}{Area_{avg}}$$

Variable	Description	Example
$Area_{Min}$	Minimum Area Counts Iterations	6.179
$Area_{avg}$	Average Area Counts	6.357
100	Conversion Constant from decimal to percent (%)	100
Q_{Min}	Method 18 Quality Parameters for Minimum	2.79%

6. Average of all concentration values used in generating calibration curve.

$$\overline{Y_{All}} = \frac{\sum_{i=1}^{n} y_i}{n}$$

Variable	Description	Example
$\overline{Y}_{All}$	Average of all concentration values. (mg/L)	22.6
y_i	Individual concentration values for each individual injection. (mg/L)	0.00
n	Number of injections.	6

7. Average of all area count values for the calibration curve.

$$\overline{X_{All}} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Variable	Description	Example
$\overline{X}_{All}$	Average of all area count values.	47.9
x_i	Individual area count values.	0.00
i	Iteration value.	1
n	Number of injections.	30

8. Determination of slope (least-squares regression) value for calibration curve.

$$m = \frac{\sum_{i=1}^{n} (x_i - \overline{x})(y_i - \overline{y})}{\sum_{i=1}^{n} (x_i - \overline{x})^2}$$

Variable	Description	Example
m	Slope of least-squares regression curve.	0.47782
x_i	Individual area count values for each individual injection.	0.00
$\overline{x}$	Average of all area count values = $\overline{X}_{All}$	48
y_i	Actual area concentration values for each individual injection. (mg/L)	0.0
$\overline{y}$	Average of all concentration values = $\overline{Y}_{All}$ ng/L)	23
i	Iteration value.	1
n	Number of injections.	0

9. Determination of y-intercept (least-squares regression) value for calibration curve.

$$b = \overline{y} - m\,\overline{x}$$

Variable	Description	Example
b	Y-axis intercept.	-0.25
$\overline{x}$	Average of all area count values = $\overline{X}_{All}$	48
$\overline{y}$	Average of all concentration values = $\overline{Y}_{All}$	23
m	Slope	0.47782

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

10. Determination of coefficient of correlation (least-squares regression) value for calibration curve.

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

Variable	Description	Example
r^2	Square of the Pearson product moment correlation coefficient through data points inknown y's and known x's.	0.99971
r	Pearson product moment correlation coefficient through data points in known y's and known x's.	0.99985
x_i	Individual area count values for each individual injection.	0.00
y_i	Actual area concentration values for each individual injection.	0.0
$\bar{x}$	Average of all area count values = $\bar{X}_{all}$	48
$\bar{y}$	Average of all concentration values = $\bar{Y}_{all}$	23
i	Iteration value.	1
n	Number of injections.	30

11. Determination of sample concentration from least-squares regression curve (mg/L).

$$C_{Reg} = m(Avg_{Inj}) + b$$

Variable	Description	Example
C_{Reg}	Sample concentration determined using the response factor (ppmv)	7.16
Avg_{Inj}	Average of all injection area counts.	15.507
m	Slope of least-squares regression curve.	0.4778
b	Y-intercept of least-squares regression curve.	-0.2

12. Determination of the Difference in Percent Scale of the pt-line.

$$\Delta pt - line_{(\%scale)} = \frac{C_A - C_R}{C_{Max}}$$

Variable	Description	Example
C_{Max}	Maximum Concentration for Samples (mg/L)	85.2
C_A	Actual Concentration (mgL)	7.07
C_R	Regression Concentration (mg/L)	7.16
$\Delta pt\text{-}line_{(\%\ scale)}$	Difference in Percent Scale of the pt-line (%)	0.10%

13. Determination of the Difference of the pt-line Percent Relative.

$$\Delta pt - line_{(\%Relative)} \frac{C_A - C_R}{C_A}$$

Variable	Description	Example
C_A	Actual Concentration (mg/L)	7.07
C_R	Regression Concentration (mg/L)	7.16
$\Delta pt\text{-}line_{(\%\ relative)}$	Difference of the pt-line Percent Relative (%)	1.24%

14. Determination of Area Counts Plus Whisker Bars

$$W_P = Area_{Max} - Q3$$

Variable	Description	Example
$Area_{Max}$	Maximum Area Counts Iterations	6.542
Q3	Quartile3	6.471
W_P	Area Counts Plus Whisker Bars	0.071

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

15. Determination of Area Counts Minus Whisker Bars

$$W_M = Q1 - Area_{Min}$$

Variable	Description	Example
$Area_{Min}$	Minimum Area Counts Iterations	0.06
Q1	Quartile1	Yes
W_M	Area counts Minus Whisker Bars	0.51

16. Average area count value for triplicate injections for pre-test calibration.

$$Avg_{PreInj} = \frac{(Area_{Trial1} + Area_{Trial2} + Area_{Trial3})}{3}$$

Variable	Description	Example
Avg_{PreInj}	Average of duplicate injection area counts	15.80
$Area_{Trial3}$	Area count for injection Trial 3	15.79
$Area_{Trial2}$	Area count for injection Trial 2	15.68
$Area_{Trial1}$	Area count for injection Trial 1	15.93
3	Constant (number of values)	3

17. Determination of Maximum Deviation

$$\sigma_{max\_i} = \frac{(Area_{Max} - Area_{avg})}{Area_{avg}}$$

f

Variable	Description	Example
$Area_{Max}$	Maximum Area Counts Iterations	8.00
$Area_{avg}$	Average Area Counts	7.87
σ_{max_i}	Maximum Deviation	0.015999763

18. Determination of Minimum Deviation

$$\sigma_{min\_i} = \frac{(Area_{Min} - Area_{avg})}{Area_{avg}}$$

Variable	Description	Example
$Area_{Min}$	Minimum Area Counts Iterations	7.764
$Area_{avg}$	Average Area Counts	7.873
σ_{min_i}	Minimum Deviation	0.013848961

19. Determination of the Percent Recovery for the Quality Check

$$R_{QC} = \frac{C_A}{C_{QC}}(100)$$

Variable	Description	Example
R_{QC}	Percent Recovery for Quality Check	103.2%
C_A	Concentration of the Analyte	87.80
C_{QC}	Concentration of the Quality Check	85.10
100	Conversion Constant	100

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

20. Determination of the Percent Recovery for the Continued Calibration Verification

$$R_{CCV} = \frac{C_A}{C_{CCV}}(100)$$

Variable	Description	Example
R_{CCV}	Percent Recovery for CCV (ppmv)	97.4%
C_A	Concentration of the Analyte (ppmv)	20.26
C_{CCV}	Concentration of the CCV (ppmv)	20.80
100	Conversion Constant	100.00

21. Determination of the Percent Recovery for the Pre-Recovery Spike

$$R_S = \frac{C_{S\_pos}}{C_{S\_pre}}(100)$$

Variable	Description	Example
R_S	Percent Recovery for Spike (ppmv)	98.6%
C_{S_pos}	Concentration of the Analyte (ppmv)	11.61
C_{S_pre}	Concentration of the Spike (ppmv)	11.77
100	Conversion Constant	100.00

22. Determination of Method Detection Limits (MDL).

22a. Determination of average result.

$$AvgM_{f\_i} = \frac{\sum_{i=1}^{n} M_{f\_i}}{n}$$

Variable	Description	Example
$AvgM_{f\_i}$	Average of spike result (ppmv)	2.782
M_{f_i}	Net results recorded for each iteration (ppmv)	2.758
n	Number of iterations.	7
i	Placeholder for iteration.	1

22b. Determination of average recovery.

$$R_f = 100\,\frac{AvgM_{f\_i}}{RA}$$

Variable	Description	Example
R_f	Average spike recovery (%)	90.9%
$AvgM_{f\_i}$	Average of spike result net weights (ppmv)	2.78
RA	Amount of spike residue added (ppmv)	3.06
100	Conversion constant (fraction to percent)	100

22c. Determination of standard deviation of results.

$$\sigma_{f-i} = \sqrt{\frac{\sum_{i=1}^{n}\left(M_{f\_i} - AvgM_{f\_i}\right)^2}{(n-1)}}$$

Variable	Description	Example
σ_{f_i}	Standard deviation of spike result.	0.52
$AvgM_{f\_i}$	Average of spike result (ppmv)	2.78
M_{f_i}	Concentrations recorded for each iteration (ppmv)	2.8
n	Number of iterations.	7
i	Placeholder for iteration.	1

Sample Calculations

Gas Chromatography Analysis

Customer:	Clean Air Palatine Source	Lab Project No:	29570	Analyst	D. Rhoades
Plant:	Sims Metal Management	Method	EPA Method 18		
Project Start Date:	9/25/17				

Calibration Point No: 2
Sample No: 29570-001

22d. Determination of variance of results.

$$V_{f\_i} = (\sigma_{f\_i})^2$$

Variable	Description	Example
V_{f_i}	Variance of spike result.	2.69E-01
σ_{f_i}	Standard deviation of spike result.	0.5183

22e. Determination of RMS deviation of result.

$$RMS_{f\_i} = 100 \frac{\sigma_{f\_i}}{AvgM_{f\_i}}$$

Variable	Description	Example
RMS_{f_i}	RMS deviation of spike results (%).	18.6%
σ_{f_i}	Standard deviation of spike result.	0.52
$AvgM_{f\_i}$	Average of spike result net weights (ppmv)	2.8
100	Conversion constant (fraction to percent)	100

22f. Determination of $t_{(n-1,\ 0.99)}$.

Value taken from the following Table:

n	$t_{(n-1,\ 0.99)}$
7	3.143
8	2.998
9	2.896
10	2.821
11	2.764
16	2.602
21	2.528

Variable	Description	Example
$t_{(n-1,\ 0.99)}$	Students' t value appropriate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom.	3.143
n	Number of iterations.	7

22g. Determination of Method Detection Limit (MDL).

$$MDL = \sigma_{f\_i} t_{(n-1,\ 0.99)}$$

Variable	Description	Example
MDL	Method detection limit (ppmv)	1.629
$t_{(n-1,\ 0.99)}$	Students' t value appropriate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom.	3.143
s_{f_i}	Standard deviation of spike result.	0.52

RAW DATA

ii

GAS CHROMATOGRAPHY RAW DATA

Customer:	Clean Air Palatine Source	Loop:	1
Analyte:	**Methane**	Column:	Double Super Q
Lab Project Number:	29570	Detector:	FID

Sample Identification	Sample Number	Injection Date	Area Count 1	Area Count 2	Area Count 3	Average Area Count	Dev Min (Trial-Mean Diff in %)	Dev Max (Trial-Mean Diff in %)	Are Min and Max Deviation Less Than 5% of Average?	DF (Analysis Dilution Factor)	Analyte Conc. (ppmv)
Run 1 - TTE Exhaust Duct	29570-001	09/27/17	10.3370	10.5242	10.3908	10.4173	0.8%	1.0%	Yes	1	4.73
Run 2 - TTE Exhaust Duct	29570-002	09/27/17	8.7872	9.5016	7.1946	8.4945	15.3%	11.9%	No	1	3.81
Run 3 - TTE Exhaust Duct	29570-003	09/27/17	10.5220	10.2571	10.8232	10.5341	2.6%	2.7%	Yes	1	4.79
Run 4 - TTE Exhaust Duct	29570-004	09/27/17	10.2794	9.5912	10.1672	10.0126	4.2%	2.7%	Yes	1	4.54
Run 5 - TTE Exhaust Duct	29570-005	09/27/17	11.0162	11.5346	11.7783	11.4430	3.7%	2.9%	Yes	1	5.22
Run 6 - TTE Exhaust Duct	29570-006	09/27/17	10.4872	10.4789	10.4166	10.4609	0.4%	0.3%	Yes	1	4.75

GAS CHROMATOGRAPHY RAW DATA

Customer:	Clean Air Palatine Source	Loop:	1
Analyte:	**Ethane**	Column:	Double Super Q
Lab Project Number:	29570	Detector:	FID

Sample Identification	Sample Number	Injection Date	Area Count 1	Area Count 2	Area Count 3	Average Area Count	Dev Min (Trial-Mean Diff in %)	Dev Max (Trial-Mean Diff in %)	Are Min and Max Deviation Less Than 5% of Average?	DF (Analysis Dilution Factor)	Analyte Conc. (ppmv)
Run 1 - TTE Exhaust Duct	29570-001	09/27/17	2.7168	2.6061	2.6852	2.6694	2.4%	1.8%	Yes	1	0.78
Run 2 - TTE Exhaust Duct	29570-002	09/27/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<
Run 3 - TTE Exhaust Duct	29570-003	09/27/17	3.4830	3.7276	3.6014	3.6040	3.4%	3.4%	Yes	1	1.02
Run 4 - TTE Exhaust Duct	29570-004	09/27/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<
Run 5 - TTE Exhaust Duct	29570-005	09/27/17	6.8270	6.9734	7.0639	6.9548	1.8%	1.6%	Yes	1	1.85
Run 6 - TTE Exhaust Duct	29570-006	09/27/17	4.3822	4.4911	4.6058	4.4930	2.5%	2.5%	Yes	1	1.24

QUALITY ASSURANCE RECORDS

CleanAir

GAS CHROMATOGRAPHY RAW DATA

Customer: Clean Air Palatine Source
Analyte: **Methane**
Lab Project Number: 29566
CCV Concentration (ppmv): 20.80
QC Concentration (ppmv): 85.10

Loop: 1
Column: Double Super Q
Detector: FID

Sample Identification	Sample Number	Injection Date	Area Count 1	Area Count 2	Area Count 3	Average Area Count	Dev Min (Trial-Mean Diff in %)	Dev Max (Trial-Mean Diff in %)	Are Min and Max Deviation Less Than 5% of Average?	DF (Analysis Dilution Factor)	Analyte Conc. (ppmv)	% Recovery
CCB	29570-000	09/26/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
QC	29570-991	09/26/17	184.0	185.5	183.3	184.3	0.5%	0.7%	Yes	1	87.8	103.2%
QC	29570-991	09/27/17	181.5	182.0	182.2	181.9	0.2%	0.2%	Yes	1	86.7	101.8%
QC	29570-991	09/27/17	182.6	182.7	182.7	182.7	0.0%	0.0%	Yes	1	87.0	102.3%
QC	29570-991	09/27/17	183.3	183.2	182.8	183.1	0.2%	0.1%	Yes	1	87.2	102.5%
CCV	29570-990	09/27/17	41.78	42.77	44.21	42.92	2.6%	3.0%	Yes	1	20.3	97.4%
CCB	29570-000	09/28/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
CCV	29570-990	09/28/17	43.90	41.71	44.17	43.26	3.6%	2.1%	Yes	1	20.4	98.2%
CCV	29570-990	09/28/17	44.09	43.42	41.22	42.91	3.9%	2.7%	Yes	1	20.3	97.4%
CCV	29570-990	09/28/17	44.23	44.16	41.56	43.31	4.1%	2.1%	Yes	1	20.4	98.3%
CCV	29570-990	09/28/17	43.98	44.26	44.25	44.16	0.4%	0.2%	Yes	1	20.9	100.3%
QC	29570-991	09/28/17	178.3	180.2	178.9	179.1	0.5%	0.6%	Yes	1	85.3	100.3%
QC	29570-991	09/28/17	177.7	178.5	178.9	178.4	0.4%	0.3%	Yes	1	85.0	99.9%
QC	29570-991	09/28/17	179.2	179.0	180.1	179.4	0.2%	0.4%	Yes	1	85.5	100.4%
QC	29570-991	09/28/17	178.9	178.7	179.5	179.1	0.2%	0.3%	Yes	1	85.3	100.2%
CCB	29570-000	10/12/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	
CCB	29570-000	10/12/17	0.00	0.00	0.00	0.00	0.0%	0.0%	Yes	1	<	

Spike Recovery Analysis

Pre-Recovery Spike	29570-001	09/29/17	25.43	25.72	24.32	25.1569	3.3%	2.2%	Yes	1	11.77
Pre-Recovery Spike	29570-002	09/29/17	61.76	57.10	54.02	57.6257	6.3%	7.2%	No	1	27.29
Pre-Recovery Spike	29570-003	09/29/17	25.38	25.44	24.55	25.1213	2.3%	1.3%	Yes	1	11.76
Pre-Recovery Spike	29570-005	09/29/17	24.93	25.23	23.84	24.6645	3.4%	2.3%	Yes	1	11.54

GAS CHROMATOGRAPHY RAW DATA

Customer:	Clean Air Palatine Source	Loop:	1
Analyte:	**Ethane**	Column:	Double Super Q
Lab Project Number:	29570	Detector:	FID
CCV Concentration (ppmv):	19.96		
QC Concentration (ppmv):	85.00		

Sample Identification	Sample Number	Injection Date	Area Count 1	Area Count 2	Area Count 3	Average Area Count	Dev Min (Trial-Mean Diff in %)	Dev Max (Trial-Mean Diff in %)	Are Min and Max Deviation Less Than 5% of Average?	DF (Analysis Dilution Factor)	Analyte Conc. (ppmv)	% Recovery
CCB	29570-000	09/26/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
QC	29570-991	09/26/17	363.0	351.4	353.8	356.1	1.3%	1.9%	Yes	1	88.4	104.0%
QC	29570-991	09/27/17	352.8	353.0	354.0	353.3	0.1%	0.2%	Yes	1	87.7	103.2%
QC	29570-991	09/27/17	358.7	352.5	352.8	354.7	0.6%	1.1%	Yes	1	88.1	103.6%
QC	29570-991	09/27/17	352.7	351.6	354.7	353.0	0.4%	0.5%	Yes	1	87.7	103.1%
CCV	29570-990	09/27/17	78.77	77.39	78.43	78.20	1.0%	0.7%	Yes	1	19.5	97.7%
CCB	29570-000	09/28/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
CCB	29570-000	09/28/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
CCV	29570-990	09/28/17	76.15	76.31	76.17	76.21	0.1%	0.1%	Yes	1	19.0	95.3%
CCV	29570-990	09/28/17	76.10	75.15	76.72	75.99	1.1%	1.0%	Yes	1	19.0	95.0%
CCV	29570-990	09/28/17	75.90	76.07	76.51	76.16	0.3%	0.5%	Yes	1	19.0	95.2%
CCV	29570-990	09/28/17	75.51	75.27	75.02	75.27	0.3%	0.3%	Yes	1	18.8	94.1%
QC	29570-991	09/28/17	344.1	343.3	342.9	343.5	0.2%	0.2%	Yes	1	85.3	100.3%
QC	29570-991	09/28/17	343.9	343.1	343.5	343.5	0.1%	0.1%	Yes	1	85.3	100.3%
QC	29570-991	09/28/17	344.9	343.9	344.6	344.5	0.2%	0.1%	Yes	1	85.5	100.6%
QC	29570-991	09/28/17	345.0	344.6	344.3	344.6	0.1%	0.1%	Yes	1	85.6	100.7%
CCB	29570-000	10/12/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	
CCB	29570-000	10/12/17	0.0000	0.0000	0.0000	0.0000	0.0%	0.0%	Yes	1	<	

Spike Recovery Analysis

Post-Recovery Spike	29570-001	09/29/17	34.08	33.93	33.39	33.80	1.2%	0.8%	Yes	1	8.50
Post-Recovery Spike	29570-002	09/29/17	19.19	37.64	16.89	24.57	31.3%	53.2%	No	1	6.22
Post-Recovery Spike	29570-003	09/29/17	34.22	35.92	35.77	35.30	3.1%	1.8%	Yes	1	8.88
Post-Recovery Spike	29570-005	09/29/17	35.83	34.87	34.44	35.05	1.7%	2.2%	Yes	1	8.81

CHAIN-OF-CUSTODY DOCUMENTATION

CLIENT Sims Metal Management

PLANT Johnston, RI

PROJECT MANAGER S. Brown

PROJECT 13318

DEPT. 66

66-13318-1

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-18 (Integrated Bags)	1	FLUE GAS SAMPLE 25 L Flex Foil BAG

FORWARDING LAB
CleanAir Analytical Services
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
Doug Rhoades

LAB ID NUMBER	DATE (2017)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Methane	Ethane		Archive	ADDITIONAL INFORMATION
29570-001	9/15	TTE Exhaust Duct	1	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			A hole was discovered in bag for Run 4 after it was unpacked from trailer. Run 2 looks like nothing is left in bag. May have leak.
-002	9/15	TTE Exhaust Duct	2	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			
-003	9/18	TTE Exhaust Duct	3	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			
-004	9/18	TTE Exhaust Duct	4	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			
-005	9/20	TTE Exhaust Duct	5	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			
-006	9/20	TTE Exhaust Duct	6	Flue Gas Sample, 25 L Flex Foil Bag	1	Y/NA	X	X			

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
E. Doak	9/22/2017 17:00	Eric Doak				B. Ansell
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
	09/25/17					

Review Items	Yes	No	NA	If No, what was the problem	Comments/Actions Taken
1. Transportation/Storage requirements met? Received at 23 °C Ambient at 23 °C	✓			1a. (CTM027) Temperature > 4°C 1b. (CTM027) Holding time > 2 wks 1c. (M26/26A) pH ≤ 8 1d. (General IC) Holding time > 4 wks 1e. (M202) Amber Glass Jars 1f. Other	
2. Is the COC filled out completely?	✓			2a. Missing Dates 2b. Missing Locations 2c. Missing Run numbers 2d. Missing/Incorrect project description information 2e. Missing Sample Matrix 2f. Missing Analysis Request 2g. Incorrect or missing number of containers 2h. All sheets Signed and Dated by customer 2i. COC not received 2j. Other	Run 2 Bob appears Stat.
3. Do sample container labels match COC?	✓			3a. Dates/Times 3b. Locations 3c. Media ID Number 3d. Label torn/Unreadable 3e. Matching Project Number 3f. Other	
4. Sample Integrity checks met?	✓			4a. Container not sealed 4b. No liquid level/volume 4c. Incorrect chemical preservative 4d. Moisture viewed in gas samples 4e. Broken Container 4f. Other	
5. Were all of the samples listed on the COC received?	✓			5a. Samples received-not listed on COC 5b. Samples not received-listed on COC	
6. Was sufficient sample received for analysis?	✓			6a. Headspace (VOA only) 6b. Minimum analysis volume not met	

Lab Project Number 29570 Login Tech [signature] Date 09/25/17

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