

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 6

2018

Bate Stamp Numbers

00841116 - 00842965

Prepared for

**Department of the Army
Longhorn Army Ammunition Plant**

1976 – 2018

***LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX***

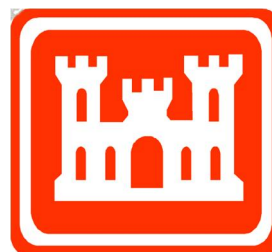
VOLUME 6

2018

- A. Title: Report – Quarterly Evaluation Report, 1st Quarter (January-March) 2017,
Groundwater Treatment Plant, Longhorn Army Ammunition Plant,
Karnack, Texas
- Author(s): AECOM Technical Services, Inc.
Recipient: U.S. Army Corps of Engineers
Date: August 2017
Bate Stamp: 00841116 – 00842965

**QUARTERLY EVALUATION REPORT
1ST QUARTER (January-March) 2017
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

Prepared For:



**U.S. Army Corps of Engineers
Tulsa District**

Prepared By:

AECOM

AECOM Technical Services, Inc.

August 2017

**QUARTERLY EVALUATION REPORT
1ST QUARTER (January-March) 2017
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

Prepared For:

U.S. Army Corps of Engineers

Tulsa District

Prepared By:

AECOM Technical Services, Inc.

Contract No. W912DY-09-D-0059

Task Order No. DS01

September 2017

Table of Contents

EXECUTIVE SUMMARY	viii
1 EVALUATION OF GWTP	1-1
1.1 Treatment Configuration	1-1
1.2 Work Performed at the GWTP	1-3
1.2.1 Major Maintenance	1-3
1.2.2 Routine Maintenance	1-3
1.2.2.1 Safety	1-4
1.2.2.2 Lubrication	1-4
1.2.2.3 Air Compressors	1-4
1.2.2.4 Belt Press and Waste Disposal	1-4
1.2.2.5 Catalytic Oxidation & Continuous Emission Monitor System	1-4
1.2.2.6 Sand Filter	1-4
1.2.2.7 Well Field at LHAAP-18/24	1-4
1.2.2.8 Miscellaneous Activities	1-5
1.2.3 Routine Maintenance at LHAAP-16	1-6
1.2.4 Routine Maintenance (Potable Water Wells)	1-6
1.3 Filter Cake Operations and Management	1-6
1.4 Fluidized Bed Reactor Operations	1-6
1.5 Process Chemical Usage at GWTP	1-7
2 EVALUATION OF LHAAP-18/24 ICT EFFECTIVENESS	2-1
2.1 Sampling Activities	2-1
2.2 Performance of Plume Capture	2-1
2.3 Quantity of Water Extracted from LHAAP-18/24	2-2
2.4 Groundwater Treatment Plant Sampling and Analysis	2-3
2.4.1 Perchlorate Sampling	2-3
2.4.2 VOC Sampling	2-4
2.4.3 Monthly Metals Sampling	2-4
2.4.4 Quarterly Sampling	2-4
3 EVALUATION OF LHAAP-16 EXTRACTION SYSTEM	3-1
3.1 Quantity of Groundwater Extracted from LHAAP-16	3-1
3.2 Groundwater Elevation	3-1
4 GROUNDWATER MONITORING AT LHAAP-18/24	4-1

5	QUALITY CONTROL	5-1
6	TREATED GROUNDWATER DISCHARGED	6-1
7	AIR MONITORING	7-1
7.1	Summary of Air Monitoring Approach	7-1
7.2	Air Monitoring Results for the 1st Quarter 2017	7-2
7.2.1	Summa Canister Monitoring Results.....	7-2
7.2.1.1	Ambient Air Results.....	7-2
7.2.1.2	Air Stripper Effluent Results.....	7-2
7.2.2	PID Results.....	7-3
8	COMMENTS AND RESPONSES	8-1

List of Figures

Figure ES-1: Groundwater Recovery between September 2012 & March 2017 – LHAAP-18/24 & LHAAP-16

Figure ES-2: Treated Water Injected in LHAAP-18/24 from December 2007 through March 2017

Figure ES-3: Water Treated Monthly from June 2012 through March 2017

Figure 2-1: Quarterly Extraction Rate

Figure 4-1: Shallow Monitoring Well Results for LHAAP-18/24

Figure 4-2: Wilcox Monitoring Well Results for LHAAP-18/24

List of Tables

Table ES-1: Discharge Information to Harrison Bayou during 1st Quarter 2017

Table 1-1: Process Chemicals Delivered and Used

Table 2-1: Monthly Groundwater Extraction Quantities (gallons)

Table 2-2: Weekly Perchlorate Sample Results

Table 2-3: Bi-Weekly GWTP Analytical Sampling Results for January 2017

Table 2-4: Bi-Weekly GWTP Analytical Sampling Results for February 2017

Table 2-5: Bi-Weekly GWTP Analytical Sampling Results for March 2017

Table 2-6: Quarterly GWTP Analytical Sampling Results for 1st Quarter 2017

Table 3-1: Groundwater Extraction Quantities at LHAAP-16 (gallons)

Table 3-2: Groundwater Elevations at LHAAP-16 Piezometers and Monitoring Wells

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water

Table 4-2: Monitoring Well Analytical Results for LHAAP-18/24

Table 6-1: Treated Groundwater Discharged to Harrison Bayou

List of Appendixes

APPENDIX A: ICT Layout and GWTP Process Flow Diagram

APPENDIX B: Groundwater Elevation Contour Maps

APPENDIX C: Water and Air Data Validation and Sampling Results for the 1st Quarter 2017

APPENDIX D: Air Monitoring Data – 1st Quarter 2017

Acronyms and Abbreviations

°F	Degrees Fahrenheit
AECOM	AECOM Technical Services, Inc.
AMCV	Air Monitoring Concentration Value
amsl	Above Mean Sea Level
bgs	Below Ground Surface
CD	Compact Disc
COD	Chemical Oxygen Demand
ESD	Explanation of Significant Differences
ESL	Effects Screening Level
FBR	Fluidized Bed Reactor
ft	Feet or foot
gpd	Gallons Per Day
gph	Gallons Per Hour
gpm	Gallons Per Minute
GWTP	Groundwater Treatment Plant
HAZWOPER	Hazardous Waste Operations
HDPE	High Density Polyethylene
HCl	Hydrochloric Acid
ICT	Interception-Collection Trench
IRA	Interim Remedial Action
lbs	Pounds
lbs/hr	Pounds Per Hour
L	Liter
LHAAP	Longhorn Army Ammunition Plant
MC	Methylene Chloride
MCL	Maximum Contaminant Level
mg/L	Milligram per Liter
Mg(OH) ₂	Magnesium Hydroxide
Microbac	Microbac Laboratories
mV	Millivolt
NA	Not Applicable

NaOH	Sodium Hydroxide
ORP	Oxidation-Reduction Potential
PCL	Protective Concentration Level
pH	Negative logarithm of hydrogen ion concentration
PID	Photoionization Detector
PM	Preventive Maintenance
ppmv	Parts Per Million by Volume
psi	Pounds Per Square Inch
ROD	Record of Decision
SWEPCO	Southwestern Electric Power Company
TAC	Texas Administrative Code
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
tpy	Tons Per Year
UEP	Unlined Evaporation Pond
µg/L	Microgram Per Liter
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UTV	Utility Terrain Vehicle
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The operation of the Groundwater Treatment Plant (GWTP) is part of the Interim Remedial Action (IRA) at Burning Ground No. 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24. A historical pilot test for nearby landfill LHAAP-16 resulted in the installation of eight extraction wells which also contribute groundwater to the GWTP. Groundwater extraction, treatment, and monitoring activities consist of:

- Continuous extraction of groundwater from multiple interception-collection trenches (ICTs) and extraction wells at both LHAAP-18/24 and LHAAP-16;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring of treated groundwater to ensure compliance with the discharge limits; and
- Discharge of treated water to Harrison Bayou, or to a holding pond (INF Pond), or the treated water may be released as irrigation water on LHAAP-18/24.

The location of the extraction wells and ICTs are shown in **Figure A-1** of **Appendix A**. The process flow diagram of the GWTP is shown in **Figure A-2** of **Appendix A**.

Figure ES-1 depicts the monthly total volume of groundwater that was extracted from the ICTs and extraction wells at LHAAP-18/24 and LHAAP-16 between January 2012 and March 2017.

The GWTP was not operational during June, July, and August 2012. This was related to meltdown of the scrubber system, associated with the catalytic oxidizer, due to system overheating. Overheating occurred when the blower became inoperable after the bearing on the scrubber blower unit was shattered and damaged the blower. This occurred around 1:00 PM on May 21, 2012.

After developing an interim air monitoring plan and obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA) to operate the GWTP without use of air abatement equipment, a pilot run of the GWTP was conducted on September 6, 2012. In that first pilot run, 85,170 gallons of water that had been stored in the influent tank (TK-140) were treated. The treated water was re-circulated through the fluidized bed reactor (FBR) to revive the FBR after three months of dormancy. Treated groundwater and air samples were collected and analyzed respectively for perchlorate, metals, and volatile organic compounds (VOCs); and VOCs only. On September 19, 2012, a second pilot run was performed at the GWTP and 107,264 gallons of water were treated. Based on the successful re-start of the GWTP, continuous groundwater extraction began again on September 24, 2012. While groundwater extraction occurs on a continuous basis, operation of the GWTP occurs intermittently due to the low volume of water available for treatment with respect to the design capacity of the GWTP. During the 3rd Quarter 2012, groundwater extraction occurred only from LHAAP-18/24. Groundwater extraction from LHAAP-16 was not performed due to equipment failure. However, extraction from LHAAP-16 began in October 2012 and the extraction volumes increased steadily throughout the 4th Quarter 2012, as pumping equipment

was gradually repaired/replaced. The GWTP operated under normal conditions until September 2015.

On September 14, 2015 at 11:15 AM, the blower on the air stripper (BL-340) malfunctioned during routine operation. The wiring on the blower was repaired and the blower operated for less than 2 hours on September 17, 2015, when the blower malfunctioned again. It was determined that the blower needed to be replaced, and groundwater extraction and operation of the GWTP ceased beginning September 18, 2015, as the influent equalization tank (TK-130) became full. Beginning on October 2, 2015, it was determined that the GWTP could operate without the blower at a reduced extraction rate. The operation of the GWTP allowed extraction of groundwater from ICTs 12E, 13A, 13B and 13C (13C was changed to ICT 13E on October 12, 2015), which were considered critical ICTs to prevent migration of contaminants to Harrison Bayou. Groundwater extraction was switched frequently between ICTs 12E, 13A, 13B, and 13E to ICTs 14B, 14C, and 14D beginning December 14, 2015.

On December 12, 2016, flange bolts at TK-380 failed and allowed hydrochloric acid (HCl) to drain into the sump. The containment area was washed down and the sump contents were transferred into TK-140 Equalization Tank. Because of the acid release, extraction of groundwater from ICTs was halted, and the GWTP was put into recycle mode (effluent sent back as influent) until the acid was neutralized and perchlorate, metals, and VOCs were below discharge criteria on March 17, 2017.

As indicated in **Figure ES-1**, the total extracted groundwater volume from LHAAP-18/24 during the 1st Quarter 2017 was lower than in previous quarters due to reduced groundwater extraction throughout the quarter. Extraction quantities in LHAAP-18/24 ranged between 0 gallons in January 2017 and 176,820 gallons in March 2017. Groundwater extraction from ICTs 12E, 13A, 13B, 13C, 13D, 13E, 13F, 14A, 14B, and 14E began on March 25, 2017. ICTs 14C and 14D were added on March 28, 2017. Extraction from LHAAP-16 remained at 0 gallons in the 1st Quarter 2017. Approximately 200,270 gallons of groundwater were extracted from LHAAP-18/24 and LHAAP 16 during the 1st Quarter 2017 compared to approximately 1,959,700 gallons extracted during the 4th Quarter 2016. The extracted groundwater volume was measured on a monthly basis as the sum of the ICTs flow meter totalizers' differences between the beginning and end of each month.

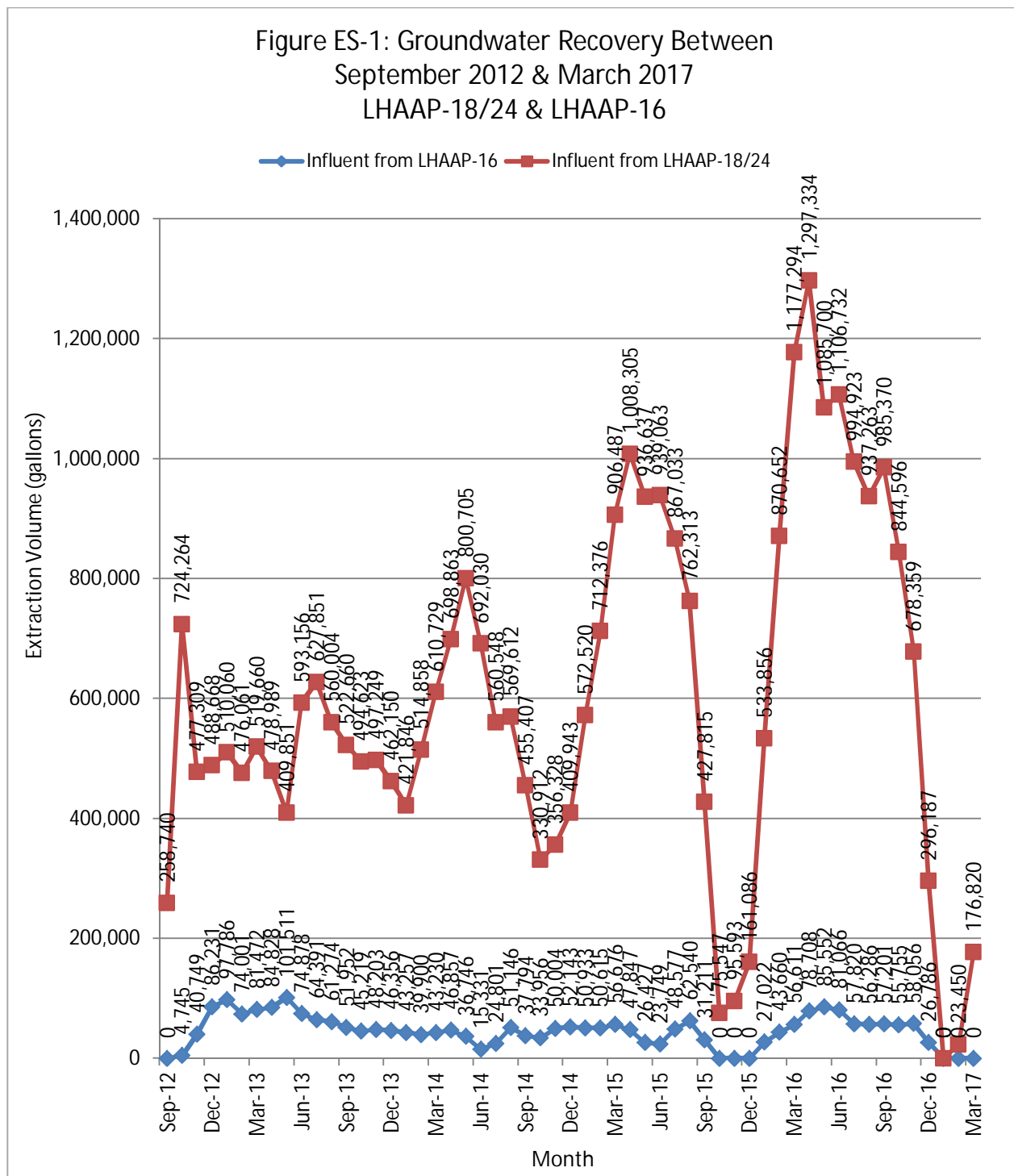
The average discharged flowrate from the GWTP was estimated at 1.2 gallons per minute (gpm) during the 1st Quarter 2017, with 6 tanker trucks contract hauled off-site for effluent above the perchlorate discharge criteria in February and the remainder discharged to Harrison Bayou for effluent below the perchlorate discharge criteria at the end of March. Grab perchlorate samples from the GWTP influent were collected on February 22 and March 13, 2017 and the following concentrations were reported: 2,680 micrograms per liter ($\mu\text{g/L}$), and 115 $\mu\text{g/L}$, respectively. The average perchlorate concentration in the GWTP influent during the quarter was 1,398 $\mu\text{g/L}$. Perchlorate concentrations in FBR effluent (TK-650) samples exceeded the effluent limits but slowly declined with time. On January 30, February 22, and March 13, 2017, FBR effluent concentrations of 5,400 $\mu\text{g/L}$, 519 $\mu\text{g/L}$, and 30.1 $\mu\text{g/L}$ were reported. After the acid spill, the low pH, low water temperature, high chloride concentration, and limited perchlorate loading caused poor FBR performance. By recycling the effluent back to the influent numerous times, the FBR eventually recovered. No discharge to Harrison Bayou occurred until the effluent perchlorate concentrations were below the discharge limit on March 15.

No treated water was returned to ICTs 6 and 9 during the 1st Quarter 2017, because this practice was discontinued after system restart in September 2012. The treated water quantities returned to LHAAP-18/24 through the injection system each month since January 2008 are shown on **Figure ES-2**.

As shown in **Table ES-1**, approximately 127,242 gallons of treated water was discharged from the GWTP to Harrison Bayou, and 28,755 gallons were contract hauled off-site for a total of 155,997 gallons discharged during the 1st Quarter 2017.

The groundwater volume processed at the GWTP ranged from a low of approximately 544,543 gallons in January 2017 to a high of approximately 745,790 gallons in February 2017. Total water processed for the 1st Quarter 2017 was approximately 1,840,888 gallons. The three month average was approximately 613,629 gallons per month. The water quantities treated each month since June 2012 are shown on **Figure ES-3**. The total volume of water processed in the 1st Quarter 2017 (1,840,888 gallons) is higher than the volume of water discharged (155,997 gallons) because the effluent was recycled to the influent numerous times.

The difference between the volume of water extracted (approximately 200,270 gallons) and the water volume discharged (approximately 155,997 gallons) is due to temporary storage of water in TK-140 and frac tanks while discharge limits were not met.



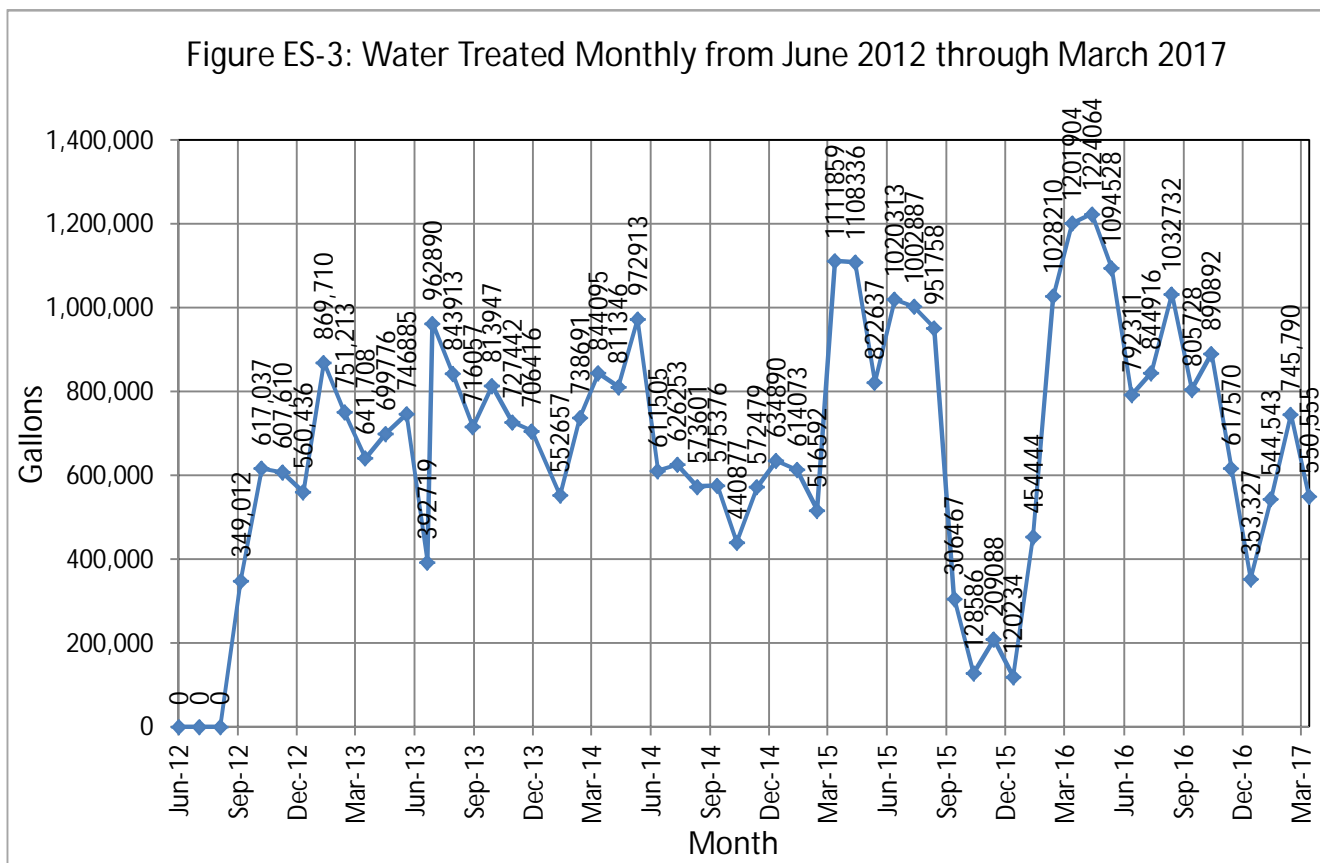
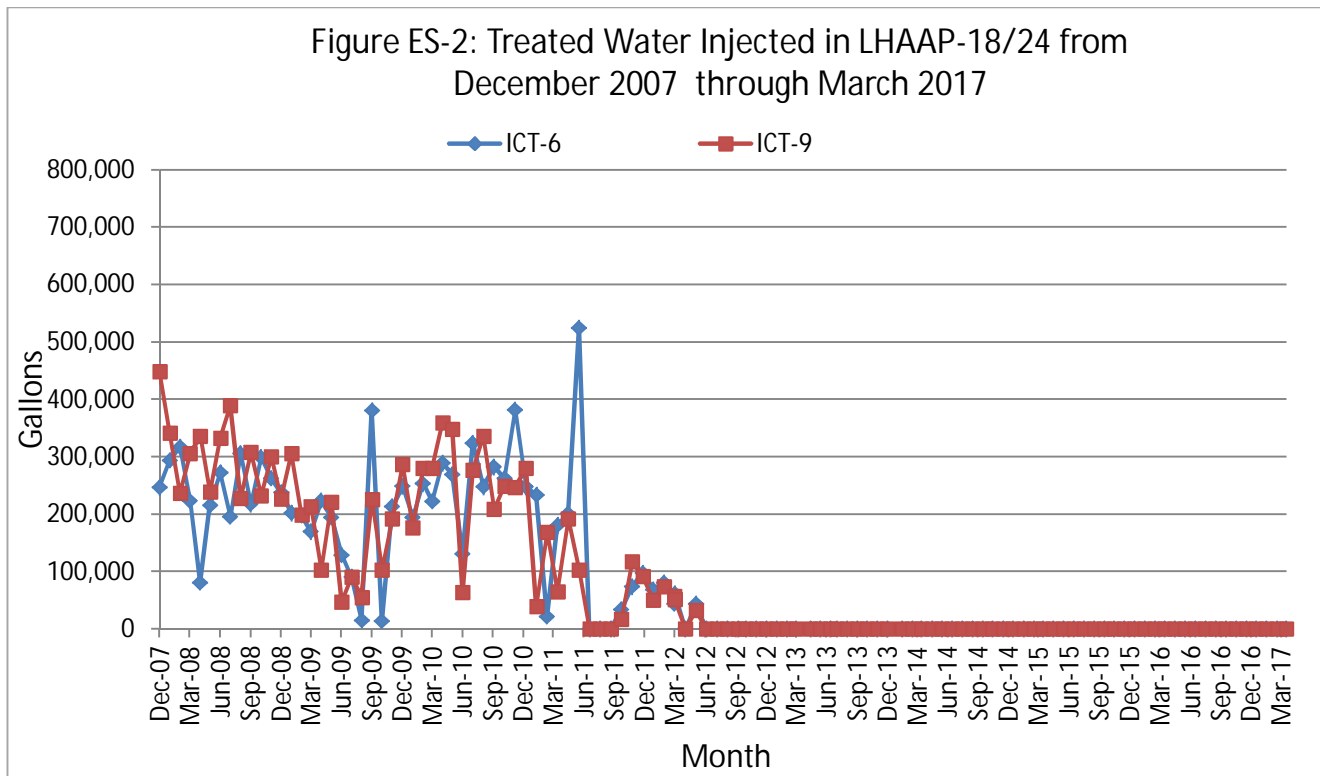


Table ES-1: Discharge Information to Harrison Bayou during 1st Quarter 2017*

Date	HB Flow (gpm)	Maximum Rate Allowed (gpm)	Maximum Rate Allowed (gallons in 24 hours)	Released From GWTP To Harrison Bayou (gallons)	Released From INF Pond to Harrison Bayou (gallons)	Combined Total Released to Harrison Bayou
03/17/2017	4381	87	125,280	387	0	387
03/18/2017	3602	72	103,680	11,823	0	11,823
03/19/2017	2092	41	59,040	16,243	0	16,243
03/20/2017	1774	35	50,400	21,652	0	21,652
03/21/2017	1510	30	43,200	19,730	0	19,730
03/22/2017	1284	25	36,000	17,101	0	17,101
03/23/2017	1068	21	30,240	9,630	0	9,630
03/24/2017	934	18	25,920	9,141	0	9,141
03/25/2017	10382	208	299,520	2,538	0	2,538
03/26/2017	FLOOD STAGE	MAXIMUM	300,000	10,132	0	10,132
03/27/2017	12573	252	362,880	8,865	0	8,865
TOTAL Discharged				127,242	0	127,242

* Days where discharge occurred are shown.

HB - Harrison Bayou

gpm - gallons per minute

GWTP - Groundwater Treatment Plant

1 EVALUATION OF GWTP

The groundwater contamination at LHAAP-18/24 likely resulted from infiltration from an Unlined Evaporation Pond (UEP) that was used to store manufacturing wastewater, and from burning trenches, and other industrial processes used to flash pyrotechnic, propellant, and explosive waste streams. The Groundwater Treatment Plant (GWTP) was constructed as part of the Interim Remedial Action (IRA) at Burning Ground No. 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24, to treat groundwater extracted from interception-collection trenches (ICTs) and extraction wells. The groundwater at LHAAP-18/24 is contaminated mainly with chlorinated ethenes and perchlorate, with lesser concentrations of 1,4-dioxane.

The GWTP also receives flow from eight extraction wells installed at LHAAP-16 as part of a historical treatability study. The extraction wells were installed in 1996 and 1997. The wells are located between the landfill at LHAAP-16 and Harrison Bayou. The groundwater at LHAAP-16 is also contaminated mainly with chlorinated ethenes and perchlorate.

1.1 Treatment Configuration

The GWTP was not operational between May 24, 2012 and September 6, 2012, due to malfunction of the scrubber unit associated with the catalytic oxidizer. Since September 6, 2012, the GWTP has operated without air abatement equipment. Although major repairs were conducted on the GWTP (e.g., replacement of level alarms, repair of the hydrochloric acid [HCl] tank, replacement of TK-650, replacement of malfunctioning valves and flow meters, replacement of metering pumps, repair or replacement of various system pumps, rust removal and repainting of various tanks, and replacement and repair of various extraction pumps, motors, and level switches), the GWTP treatment configuration has remained unchanged.

Malfunction of the blower on the air stripper (BL-340) on September 14, 2015 and on September 17, 2015 disrupted continuous extraction and routine operations of the GWTP, which lasted through January 7, 2016. Prior to this occurrence, the GWTP performed as designed and the GWTP was operated on an as needed basis (i.e., on semi-continuous operational basis). During the 4th Quarter 2015, groundwater was extracted from a limited number of ICTs (ICTs 12E, 13A, 13B, 13C, and/or 13E, or ICTs 14B, 14C, and 14D). Operation of the GWTP occurred on a batch basis through the fluidized bed reactor (FBR). After replacement of the blower, attempts were made to restore continuous operations to the FBR but remained predominantly on a batch basis throughout January 2016.

After the acid release in the 4th Quarter 2016, extraction of groundwater from ICTs was halted, and the GWTP was put into recycle mode (effluent sent back as influent). Low pH, low water temperature, high chloride concentration, and limited perchlorate loading caused poor FBR performance. By recycling the effluent back to the influent numerous times, the FBR eventually recovered and perchlorate, metals, and volatile organic compounds (VOCs) were below discharge criteria beginning on March 17, 2017. Groundwater extraction from ICTs 12E, 13A, 13B, 13C, 13D, 13E, 13F, 14A, 14B, and 14E began on March 25, 2017. ICTs 14C and 14D were added on March 28, 2017. Operation of the GWTP occurred on the following days in the 1st Quarter 2017: January 5, 6, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 30, and 31, 2017, and February 1, 2, 3, 6, 7, 10, 13, 14, 16, 17, 20, 21, 22, 23, 24, 27, and 28, 2017, and March 1, 2, 3, 6, 7, 8, 9, 10, 13, 14, 15, 17, 20, and 28, 2017. Flow rates for the treatment

processes for metals and VOCs ranged between 39 and 192 gallons per minute (gpm) with an average of approximately 85 gpm for the operating hours (i.e., this flow rate does not represent continuous flows). The GWTP operated for 363 hours during the quarter. The process flow diagram is included as **Figure A-2** of **Appendix A**. The treatment configuration of the plant at these rates (with minor variations) is as follows:

GWTP Metals Precipitation Operating Parameters

Pretreatment Settings	Tank 200-A Mg(OH)₂ Mixing	Tank 200-B NaOH Mixing	Tank 200-C Polymer Mixing	Tank 300 feed line to Air Stripper
pH Adjustment	9.0	10.5	NA	5.0 to meet ≤ 8.0 release from stripper
Feed Pump Settings	Speed 100% Stroke 100% 10 gph Mg(OH) ₂	Speed 100% Stroke 100% 9.0 gph NaOH	Speed 90% Stroke 100% 40 gph water	Speed 80% Stroke 80% 10 gph HCl

Notes:

gph gallons per hour HCl hydrochloric acid NaOH sodium hydroxide
 GWTP Groundwater Treatment Plant Mg(OH)₂ magnesium hydroxide NA not applicable

GWTP Air Compressors Operating Parameters

Air Compressors	K-700A	K-700B	K-701
Air Pressure Settings	88 psi	88 psi	105 psi

Notes:

GWTP Groundwater Treatment Plant
 psi pounds per square inch

GWTP Stripper Operating Parameters

Stripper Tower	
pH Settings	7.4
Inlet Pressure Gauge	Not operational
Stripper Pressure Gauge	Not operational
Air Flow Rate	Not operational

Notes:

GWTP Groundwater Treatment Plant

GWTP Fluidized Bed Reactor Operating Parameters

Fluidized Bed Reactor	
Carbon Bed Height	12 feet & 8 to 11 inches
Recycle Flow Rate	200 gpm
pH	7.1 to 7.4
Recycle oxidation-reduction potential (ORP)	-430 mV to -452 mV

Notes:

gpm gallons per minute
 GWTP Groundwater Treatment Plant
 mV millivolts

1.2 Work Performed at the GWTP

Work performed at the GWTP during the 1st Quarter 2017 is described in the following subsections.

1.2.1 Major Maintenance

The major maintenance items that were completed at the GWTP during this quarterly reporting period are:

- 01/03/17: Power outage occurred on 01/02/17. Worked to restore water pressure all day.
- 01/09/17: Discovered that GWTP did not have potable water. Pipe burst because of freezing temperatures and was repaired.
- 02/23/17: Drained TK-300 to repair broken piping on discharge of P-320. Fabricated and installed new 3" piping and flanges on discharge of P-320.
- 03/14/17: Ark-La-Tex Electric on site to work on electricity transfer.
- 03/16/17: Southwestern Electric Power Company (SWEPCO) and Ark-La-Tex Electric on site for electrical transfer to new transformer. Power was off for 6.5 hours.
- 03/23/17-03/24/17: Unplugged influent and effluent piping and drained INF pond.
- 03/26/17-3/31/17: Worked to restore potable water to GWTP.
- 03/30/17: SWEPCO on site to change out four power poles. Power was off for 5.5 hours for this work.

1.2.2 Routine Maintenance

The following routine maintenance items were completed at the GWTP during this quarterly reporting period:

- Drained all water lines, process lines, and pumps for freeze protection.
- Removed polymer feed tank, cleaned out the bottom of the tank, and replaced.
- Mowed grass around all directional signs, GWTP, and the Army trailer.

- Rebuilt grundfos pumps.

1.2.2.1 Safety

- 01/24/17: Scott completed 8-Hour Hazardous Waste Operations (HAZWOPER) refresher online course.

1.2.2.2 Lubrication

- No lubrication maintenance was conducted during the reporting period.

1.2.2.3 Air Compressors

- Ingersoll-Rand on site to perform quarterly project management (PM) on air compressor K-701.
- Ingersoll-Rand on site to repair air compressor K-701 (twice).

1.2.2.4 Belt Press and Waste Disposal

- No belt press or waste disposal was conducted during the reporting period.

1.2.2.5 Catalytic Oxidation & Continuous Emission Monitor System

- The catalytic oxidizer was not operated during the reporting period.

1.2.2.6 Sand Filter

- No maintenance or repairs were conducted on the sand filter.

1.2.2.7 Well Field at LHAAP-18/24

- Collected monthly piezometer levels.
- Collected monthly groundwater levels in all wells.
- Repaired three sample ports on ICT wells.
- Pulled piping and pump out of ICT 13C and 14C. Rodded out all piping and installed new electric motor at ICT 14C and installed rebuilt grundfos pump at both 13C and 14C.
- Repaired sample ports on ICT 14D, ICT 13A, and ICT 7.
- Repaired broken concrete pad and installed one bollard on MW-16.
- Repaired broken concrete pad at MW-17.
- Installed one bollard at MW-23.
- Install new flow meters on ICT 13B and ICT 13F.
- Cleaned and adjusted low level probes in ICT 13B and ICT 14E.
- Sampled wells at Site 18/24.

1.2.2.8 Miscellaneous Activities

- Installed new fuel filter on Kubota Utility Terrain Vehicle (UTV).
- Mixed new batch of nutrients for FBR.
- Installed drum heater on acetic acid drum.
- Triple rinsed empty acetic acid drums and placed in storage location.
- Replaced leaking 1” union on discharge line of P-270.
- Developed an Operational Security Plan.
- Installed fittings from effluent discharge to frac tank.
- Performed work on effluent discharge pump P-642.
- Installed fittings and hose to connect frac tanks.
- Performed maintenance on polymer line.
- Completed sampling of six wells at Site 001.
- Installed new recoil starter assembly on Honda trash pump.
- Mowed around monitoring wells at Site 46.
- Assembled rolling ladder.
- Replaced 3” strainer on suction hose of Honda trash pump.
- Installed solid piece of viton and blind flange at top of TK-380. Replaced nuts on bolts of flange at bottom of TK-380.
- Installed new Honda trash pump.
- Performed inspection at Site 001 and 003.
- Installed new suction tubing on carbon donor feed pump (P-104).
- Performed maintenance on P-101A.
- Performed housekeeping at GWTP office and Army trailer.
- Mowed around directional signs, GWTP, and Army trailer.
- Collected quarterly surface water samples from Harrison Bayou and Goose Prairie Creek.
- Collected split samples from Harrison Bayou with United States Environmental Protection Agency (USEPA).
- Collected velocity readings in Harrison Bayou.
- Performed chloride and sulfate analysis.

- Installed locks on new transformer.
- Changed oil and oil filter in lawn mower.
- Installed new bladder tank at potable water pump.

1.2.3 Routine Maintenance at LHAAP-16

- Collected monthly groundwater levels in all wells.

1.2.4 Routine Maintenance (Potable Water Wells)

- Drain all potable water lines, process lines, and pumps for freeze protection.

1.3 Filter Cake Operations and Management

- No filter cake operations took place during this reporting period.

1.4 Fluidized Bed Reactor Operations

The FBR is a biological treatment process that requires certain environmental conditions, such as pH, temperature, nutrients, and Oxidation-Reduction Potential (ORP) to be within specific ranges to promote the health and stability of the FBR microorganisms and achieve dependable performance. For most of the 1st Quarter 2017, the FBR was not operating efficiently due to the following conditions:

- Low FBR temperatures (e.g. 54 degrees Fahrenheit (°F) on 1/9/2017);
- Low pH (< 6);
- Chloride concentration of 4,800 milligrams per liter (mg/L); and
- No perchlorate loading until 1/23/2017.

By recycling the effluent back to the influent and contract hauling six truckloads of partially treated water off-site, the FBR slowly reduced perchlorate concentrations from 5,400 micrograms per liter ($\mu\text{g/L}$) on January 30, 2017 down to 2.37 $\mu\text{g/L}$ on March 15, 2017. During this period, the ORP ranged between -87 and -362 millivolts (mV), and the pH ranged between 6.7 and 7.4 standard units. While in recycle mode, the nutrients levels were higher than usual with ammonia nitrogen concentrations between 48.8 mg/L to 54.9 mg/L, and orthophosphate concentrations between 3.43 mg/L and 4.33 mg/L. Excess acetic acid that was not consumed in the FBR, may have caused the chemical oxygen demand to exceed the discharge criteria in the quarterly sample collected on March 29, 2017. The nutrients and electron donor concentrations are expected to return to normal levels once the GWTP is no longer in recycle mode. After the perchlorate concentrations fell below the discharge criteria, the high chloride water was discharged from the GWTP and replaced with freshly extracted groundwater beginning on March 26, 2017. The average perchlorate concentration in the GWTP influent during the 1st Quarter 2017 was 1,398 $\mu\text{g/L}$.

1.5 Process Chemical Usage at GWTP

Approximate chemical consumption and the quantity delivered during the 1st Quarter 2017 are shown on **Table 1-1**.

Table 1-1: Process Chemicals Delivered and Used

Chemical	Usage 1st Quarter 2017	Quantity Delivered 1st Quarter 2017
Hydrochloric acid	330 gallons	48,039 lbs = 4,200 gallons
Sodium hydroxide (35%)	1,900 gallons	--
Acetic acid (50%)	990 gallons	--
Phosphoric acid (75%)	52.8 liters	--
Magnesium hydroxide	650 gallons	--
Urea	390.9 lbs.	500 lbs.
Polymer (magnafloc 110-L)	25.5 liters	--

Note(s):

L – liters

lbs - pounds

2 EVALUATION OF LHAAP-18/24 ICT EFFECTIVENESS

The ICT system at Burning Ground No. 3 is composed of 14 sections ranging in length from 100 feet (ft) to 1,300 ft. A total of approximately 5,000 linear ft. of trench was installed within and around three sides of Burning Ground No. 3. The trench sections extend approximately 22 ft to 45 ft below ground surface (bgs). Most, but not all of the trenches are as deep as the confining clay layer of the shallow groundwater zone. High density polyethylene (HDPE) liners were installed in ICTs 12 and 13, located on the western and northern boundaries of LHAAP-18/24, respectively. The locations of the liners are shown on **Figure A-1** in **Appendix A**. **Table A-1** in **Appendix A** presents the depths of the ICTs.

2.1 Sampling Activities

Annual compliance sampling of the ICT sumps occurred during the reporting period; however, sampling of the monitoring wells at LHAAP-18/24 did not occur during the 1st Quarter 2017. The analytical results of ICT samples are presented in **Section 4**.

2.2 Performance of Plume Capture

The intent of the ICTs is to control groundwater gradients, prevent off-site migration of contaminated groundwater, and to extract the most highly contaminated groundwater and reduce the mass of contaminants in groundwater. Liners were installed in the ICTs on the northern (ICT 13) and western (ICT 12) site boundaries to limit migration of contaminated water from the site towards Harrison Bayou. At the same time, the liners reduce or prevent removal of contaminated groundwater that is outside the containment zone, between the site and Harrison Bayou. The ICTs are installed within the shallow subsurface at the site and capture primarily shallow groundwater (e.g., < 40 ft bgs).

In 2007 and 2008, in consultation with the Texas Commission on Environmental Quality (TCEQ) and the USEPA, the Army ceased operations of ICTs 1, 3, 5, 10, and 12A for groundwater extraction (note that extraction from ICT 12A was resumed after pump replacement in December 2012). Two other ICTs (ICT 6 and ICT 9) were changed from extraction ICTs to re-injection ICTs. Groundwater extraction from well EW-01 located in the northeast central portion of the site began in October 2008 and well 18WW17 located to the northeast of the ICT containment area began in January 2008. **Table B-1** in **Appendix B** presents a summary of extraction equipment replacement since 2011, as dictated by poor extraction performance (malfunctioning pumps, poor pump positioning with respect to groundwater, non-operational level probes, scale build up, etc.). Further discussion of extraction performance of various ICTs and extraction wells is presented in **Section 2.3**.

Potentiometric surface maps of the shallow zone groundwater in the vicinity of LHAAP-18/24, based on groundwater elevations measured on 12 January, 15 February, and 14 March 2017 are shown on **Figures B-1, B-2, and B-3** in **Appendix B**, respectively.

The potentiometric surface maps of the shallow zone were contoured by hand. The HDPE liners in the ICTs, where present, were interpreted as groundwater flow barriers. The potentiometric surface maps for January, February, and March 2017 continue to reflect high groundwater elevations in the northern/northwestern portion of the site with groundwater flow occurring radially from a groundwater high at monitor well 123 (175.46 ft above mean sea level [amsl]),

January 2017, 175.60 ft amsl, February 2017 and 176.04 ft amsl, March 2017) inside the ICT containment area. However, higher groundwater elevations were seen in wells BGPZ01, MW-20, and 18CPTMW22R during the 1st Quarter 2017 between 180.27.63 and 174.79 ft amsl. These three wells are located just outside of the south corner of the ICT containment area. The elevated groundwater levels in these wells (BGPZ01, MW-20, and 18CPTMW22R) are likely due to wells being screened in the perched sand channel.

The elevated potentiometric surface contours within the ICTs compared to the lower potentiometric surface contours on the outside of the ICTs is likely due to a no flow boundary condition caused by the ICT liners and groundwater extraction along the ICTs. From the groundwater high at monitoring wells 123 and AWD-2 groundwater flows radially towards the surrounding ICTs which include ICT 13 to the north and northwest, and ICT 12 to the west and southwest. East of the groundwater mound and in the north eastern third of the site, groundwater flow is primarily towards ICT 14 along the northeast site boundary.

Groundwater extraction rates from the ICTs were 0 gallons in January 2017, approximately 23,450 gallons in February 2017, and approximately 176,820 gallons in March 2017. Rainfall amounts recorded at the GWTP were 3.65 inches in January 2017, 2.19 inches in February 2017, and 2.63 inches in March 2017.

During the reporting period, approximately 127,242 gallons of treated groundwater was discharged to Harrison Bayou. No treated groundwater from the GWTP was returned to LHAAP-18/24 site via the sprinkler system. Overall groundwater levels increased throughout the 1st Quarter 2017 with the average Shallow zone groundwater elevation increase of 1.66 ft. This increase is likely a response to no groundwater extraction in January 2017 and the reduced extraction rates in February and March 2017 from the ICTs and combined with a moderate amount of precipitation for the quarter.

Groundwater levels in Wilcox Formation wells (generally > 40 to 50 ft bgs) were measured during the 1st Quarter 2017 groundwater gauging events. Wilcox Formation wells correspond generally to those wells previously identified as “Intermediate” and “Deep” wells. “Intermediate” wells are designated as Upper Wilcox Formation wells and “Deep” wells are designated as Lower Wilcox Formation wells. Generally, groundwater in the Upper and Lower Wilcox Formation wells are in hydraulic communication and so can be treated as a single hydrogeologic unit. Therefore, the groundwater elevations in Upper Wilcox wells were used to construct the potentiometric surface maps for the Wilcox Formation. **Figures B-4, B-5, and B-6** of **Appendix B** show the locations of the Wilcox Formation monitoring wells and the potentiometric surface of the Wilcox aquifer, based on static water levels measured during the January, February, and March 2017 gauging events, respectively. Groundwater in the Wilcox aquifer generally flows in a northerly direction, towards Caddo Lake and there is a downward vertical gradient between the overlying shallow zone and Wilcox Formation. However, a groundwater high in the Wilcox occurs in the area of MW-14. The groundwater elevations in the Wilcox aquifer appeared generally stable between January and March 2017.

2.3 Quantity of Water Extracted from LHAAP-18/24

The average daily extraction rates from the ICTs were 0 gallons per day (gpd) in January, approximately 838 gpd in February, and approximately 5,704 gpd in March 2017. The average

daily extraction rate was lower in January and February 2017 because there was no room to store and treat extracted groundwater while the GWTP was recovering from the acid spill.

The volume of groundwater removed from LHAAP-18/24 and LHAAP-16 during the 1st Quarter 2017 measured approximately 102,658 gallons, based on total flow measured at the GWTP headwork. **Figure 2-1** shows the historical trends of extracted volumes by quarter.

In contrast to the approximate total extracted volume based on total flow measured at the GWTP, the total estimated volume based on individual flow meter readings from LHAAP-18/24 and LHAAP-16 was approximately 200,270 gallons. The difference is approximately 64%, with flow volumes measured at the headwork of the GWTP considered more representative of the extracted groundwater volume due to inaccuracies in the individual flow meter readings.

As indicated by **Table 2-1**, 14 of 28 ICTs produced water during the 1st Quarter 2017. Below are brief explanations for the fourteen ICT wells that were not productive:

- ICTs 1, 3, 5, and 10 were shut down on 18 February 2008 as part of a Pilot Study implementation and remain non-operational;
- The pump motor failed in ICT 13D; and
- ICTs 2, 4, EW-01, 7, 8, 18WW17, 11, 12C, and 12D were shut down until the FBR was capable of treating perchlorate to discharge levels at full extraction rates.

2.4 Groundwater Treatment Plant Sampling and Analysis

As part of the GWTP operations, samples from various water streams are required to be collected and analyzed for the parameters cited in the Interim Record of Decision (ROD) and the TCEQ letter dated January 8, 2002. Besides the ROD sampling requirement, additional sample analyses are typically performed on the influent and effluent samples to monitor the effectiveness of the FBR process. **Sections 2.4.1** through **2.4.4** present the results of analyses conducted during the 1st Quarter 2017. The complete laboratory results are provided on a compact disk (CD) (**Appendix C**).

2.4.1 Perchlorate Sampling

Table 2-2 presents the effluent perchlorate results for the 1st Quarter 2017. While the GWTP was in recycle mode, two perchlorate concentrations in the effluent (T-650) exceeded the daily maximum concentration discharge limit of 13 µg/L. Perchlorate was reported on January 30 and February 22, 2017 at concentrations of 5,400 µg/L and 519 µg/L, respectively. Beginning in March, the perchlorate concentrations ranged from 6.06 µg/L to non-detect. Treated groundwater from the GWTP was discharged to Harrison Bayou during the current quarter when effluent perchlorate concentrations were less than the daily maximum concentration of 13 µg/L, and adequate flow in the bayou was observed.

Two grab samples from the influent to the GWTP (TK-140) were collected. The perchlorate concentrations in these samples were 2,680 and 115 µg/L.

2.4.2 VOC Sampling

Tables 2-3 through 2-5 present the effluent VOC results for January, February, and March 2017. Sampling of the effluent for VOCs was conducted on a biweekly basis beginning on February 22, 2017, while the GWTP was in recycle mode until the FBR recovered. The results, where applicable, were below the discharge limits. The tables also provide monthly influent concentrations for VOCs and perchlorate.

2.4.3 Monthly Metals Sampling

As per the revised sampling and analysis plan (Shaw, 2007), the monthly metals sampling is reported in **Tables 2-3 through 2-5**. None of the metals exceeded the effluent discharge limits; however, the selenium reporting limit of 80 mg/L exceeded the daily average limit of 5.7 mg/L and the daily maximum concentration of 12 mg/L .

2.4.4 Quarterly Sampling

Sampling of the effluent for VOCs, anions, chemical oxygen demand (COD), oil and grease, perchlorate, and metals was conducted during this quarter and the results were below the discharge limits except for COD, which was present in the effluent at a concentration of 807 mg/L . High COD in the effluent was probably due to excess acetic acid addition while the FBR was performing poorly. Once the FBR recovers, the COD concentration should fall to below the discharge criteria. **Table 2-6** presents the analytical results for the 1st Quarter 2017.

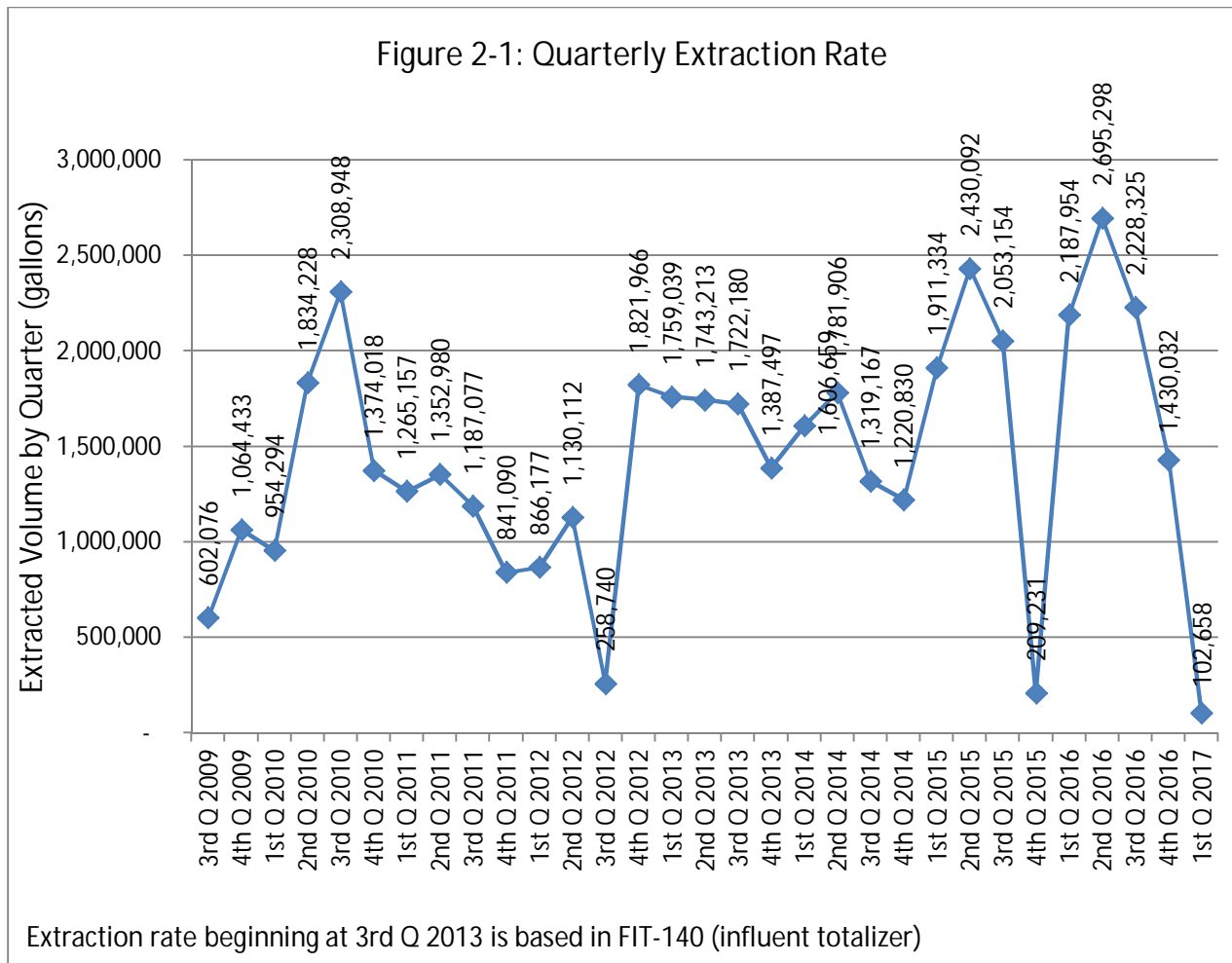


Table 2-1: Monthly Groundwater Extraction Quantities (Gallons)

Well #	Jan-17	Feb-17	Mar-17	Total
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
EW-01	0	0	0	0
7	0	0	0	0
8	0	0	0	0
18WW17	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12A	0	0	937	937
12B	0	0	2,834	2,834
12C	0	0	0	0
12D	0	0	0	0
12E	0	8,642	18,618	27,259
13A	0	3,051	22,161	25,211
13B	0	966	40,638	41,604
13C	0	1,494	26,405	27,899
13D	0	0	1,466	1,466
13E	0	1,735	6,926	8,661
13F	0	0	414	414
14A	0	86	481	567
14B	0	866	11,399	12,264
14C	0	2,933	17,228	20,160
14D	0	3,613	19,658	23,271
14E	0	67	7,656	7,723
Total LHAAP-18/24	0	23,450	176,820	200,270
LHAAP-16	0	0	0	0
Total LHAAP-16	0	0	0	0
TOTAL	0	23,450	176,820	200,270

Table 2-2: Weekly Perchlorate Sample Results

Sample ID	Date Sampled	Sample Location	Effluent Limitation for Discharge (µg/L)		MAL	Influent	Effluent		Does Concentration Meet Discharge Limit? (Yes/No)
			Daily Average Concentration	Daily Maximum Concentration		Result (µg/L)	Result (µg/L)	DVQ	
LH18/24-SP650-6416-grab	1/30/2017	TK650	6	13	2	NA	5,400		No
LH18/24-SP650-6417-grab	2/22/2017	TK650	6	13	2	NA	519	J	No
LH18/24-SP650-6420-grab	3/1/2017	TK650	6	13	2	NA	<20	UJ	Yes
LH18/24-SP650-6422-grab	3/8/2017	TK650	6	13	2	NA	<20	UJ	Yes
LH18/24-SP650-6424-grab	3/15/2017	TK650	6	13	2	NA	2.37	J	Yes
LH18/24-SP650-6426-grab	3/22/2017	TK650	6	13	2	NA	6.06		Yes

Notes:

No discharge to Harrison Bayou occurred unless perchlorate concentration was below the daily maximum concentration of 13 µg/L.

SP140 samples are influent samples.

µg/L - micrograms per liter

DVQ - data validation qualifier

ID - identification

J - Estimated concentration

MAL - minimum analytical level

NA - not applicable

U - non detect

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

Table 2-3: Bi-Weekly GWTP Analytical Sampling Results for January 2017

No bi-weekly sampling occurred in January 2017 due to process upset on 12/12/16.

	Sample Location			EFFLUENT		EFFLUENT		INFLUENT		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
	Sample Identification			LH18/24-SP650		LH18/24-SP650		LH18/24-SP140		
	Sample Date			Jan-17		Jan-17		Jan-17		
	Sample Type			COMP		GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	MAL							
VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
1,1,1-Trichloroethane	3,417	7,230	10	NA		NA		NA		NA
1,1,2-Trichloroethane	102.5	216.9	10	NA		NA		NA		NA
1,1-Dichloroethane	6,633	14,032	10	NA		NA		NA		NA
1,1-Dichloroethene	119	253	NA	NA		NA		NA		NA
1,2-Dichloroethane	85	181	10	NA		NA		NA		NA
Acetone	1,132	2,395	NA	NA		NA		NA		NA
Benzene	85	181	10	NA		NA		NA		NA
Carbon Tetrachloride	85	181	10	NA		NA		NA		NA
Chloroform	1,708	3,615	10	NA		NA		NA		NA
Ethylbenzene	26,954	57,025	10	NA		NA		NA		NA
m,p-Xylenes	39.5	83.6	NA	NA		NA		NA		NA
Methylene Chloride	803	1,699	20	NA		NA		NA		NA
o-Xylene	39.5	83.6	NA	NA		NA		NA		NA
Styrene	2,829	5,987	NA	NA		NA		NA		NA
Tetrachloroethene	85.4	180.7	10	NA		NA		NA		NA
Toluene	1,980	4,189	10	NA		NA		NA		NA
Trichloroethene	85	181	10	NA		NA		NA		NA
Vinyl Chloride	34	72	10	NA		NA		NA		NA
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		
Chloride	NA	NA	NA	NA		NA		NA		NA
Sulfate	NA	NA	NA	NA		NA		NA		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
Perchlorate	6	13	2	NA		NA		NA		NA
METALS	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
Hexavalent Chromium	58	124	10	NA		NA		NA		NA
Lead	2.2	4.6	5	NA		NA		NA		NA
Selenium	5.7	12	5	NA		NA		NA		NA
Silver	1.4	3	2	NA		NA		NA		NA
Barium	1,000	2,000	10	NA		NA		NA		NA
SEMI-VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
1,4-Dioxane*	NA	134.2	NA	NA		NA		NA		NA

Notes:

µg/L - micrograms per liter

DVQ - data validation qualifier

GWTP - Groundwater Treatment Plant

MAL - minimum analytical level

mg/L - milligrams per liter

NA - not applicable

ROD - Record of Decision

Grab samples are compared to the daily maximum and composite samples to the daily average.

* Calculated Effluent Limit

Table 2-4: Bi-Weekly GWTP Analytical Sampling Results for February 2017

Sample Location Sample Identification Sample Date Sample Type				EFFLUENT		INFLUENT		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
				LH18/24-SP650-6418		LH18/24-SP140-7418		
				22-Feb-17		22-Feb-17		
				GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	MAL					
VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		
1,1,1-Trichloroethane	3,417	7,230	10	<0.5	U	NA		
1,1,2-Trichloroethane	102.5	216.9	10	<0.5	U	NA		
1,1-Dichloroethane	6,633	14,032	10	<0.25	U	NA		
1,1-Dichloroethene	119	253	NA	<1	U	NA		
1,2-Dichloroethane	85	181	10	<0.5	U	NA		
Acetone	1,132	2,395	NA	13		NA		
Benzene	85	181	10	<0.25	U	NA		
Carbon Tetrachloride	85	181	10	<0.5	U	NA		
Chloroform	1,708	3,615	10	<0.25	U	NA		
Ethylbenzene	26,954	57,025	10	<0.5	U	NA		
m,p-Xylenes	39.5	83.6	NA	<1	U	NA		
Methylene Chloride	803	1,699	20	<0.5	U	NA		
o-Xylene	39.5	83.6	NA	<0.5	U	NA		
Styrene	2,829	5,987	NA	<0.25	U	NA		
Tetrachloroethene	85.4	180.7	10	<0.5	U	NA		
Toluene	1,980	4,189	10	<0.5	U	NA		
Trichloroethene	85	181	10	4		NA		
Vinyl Chloride	34	72	10	<0.5	U	NA		
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		
Chloride	NA	NA	NA	NA		NA	NA	
Sulfate	NA	NA	NA	NA		NA	NA	
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		
Perchlorate	6	13	2	NA		2,680	NA	
METALS	µg/L	µg/L	µg/L	µg/L		µg/L		
Hexavalent Chromium	58	124	10	<10	UJ	<10	UJ	
Lead	2.2	4.6	5	<1	U	NA		
Selenium*	5.7	12	5	<80	U	<80	U	
Silver	1.4	3	2	<1	U	<1	U	
Barium	1,000	2,000	10	241		NA		
SEMI-VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		
1,4-Dioxane*	NA	134.2	NA	20.2		NA		

Notes:

µg/L - micrograms per liter

DVQ - data validation qualifier

GWTP - Groundwater Treatment Plant

MAL - minimum analytical level

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

mg/L - milligrams per liter

NA - not applicable

ROD - Record of Decision

U - non detect

Grab samples are compared to the daily maximum and composite samples to the daily average.

* Selenium reporting limit exceeds the daily average discharge limit.

** Calculated Effluent Limit

Table 2-5: Bi-Weekly Analytical GWTP Sampling Results for March 2017

Sample Location Sample Identification Sample Date Sample Type				EFFLUENT		EFFLUENT		INFLUENT		EFFLUENT		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
				LH18/24-SP650-6421		LH18/24-SP650-6423		LH18/24-SP140-7423		LH18/24-SP650-6425		
				6-Mar-17		13-Mar-17		13-Mar-17		20-Mar-17		
				GRAB		GRAB		GRAB		GRAB		
Effluent Limitation for Discharge (µg/L) per Table 2 of ROD				Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	
Daily Average Concentration	Daily Maximum Concentration	MAL										
VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		
1,1,1-Trichloroethane	3,417	7,230	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	10	<0.25	U	<0.25	U	NA		<0.25	U	Yes
1,1-Dichloroethene	119	253	NA	<1	U	<1	U	NA		<1	U	Yes
1,2-Dichloroethane	85	181	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
Acetone	1,132	2,395	NA	<5	U	36.2		NA		7.43	J	Yes
Benzene	85	181	10	<0.25	U	<0.25	U	NA		<0.25	U	Yes
Carbon Tetrachloride	85	181	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
Chloroform	1,708	3,615	10	<0.25	U	<0.25	U	NA		<0.25	U	Yes
Ethylbenzene	26,954	57,025	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
m,p-Xylenes	39.5	83.6	NA	<1	U	<1	U	NA		<1	U	NA
Methylene Chloride	803	1,699	20	<0.5	U	<0.5	U	NA		<0.5	U	Yes
o-Xylene	39.5	83.6	NA	<0.5	U	<0.5	U	NA		<0.5	U	Yes
Styrene	2,829	5,987	NA	<0.25	U	<0.25	U	NA		<0.25	U	NA
Tetrachloroethene	85.4	180.7	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
Toluene	1,980	4,189	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
Trichloroethene	85	181	10	3.49		3.19		NA		2.84		Yes
Vinyl Chloride	34	72	10	<0.5	U	<0.5	U	NA		<0.5	U	Yes
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		
Chloride	NA	NA	NA	4190		NA		NA		4270		NA
Sulfate	NA	NA	NA	115		NA		NA		115		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		
Perchlorate	6	13	2	1.06		30.1		115		1.85		No
METALS	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		
Hexavalent Chromium	58	124	10	NA		<10	U	<10	U	NA		Yes
Lead	2.2	4.6	5	NA		<1	U	NA		NA		Yes
Selenium*	5.7	12	5	NA		<80	U	<80	U	NA		Yes
Silver	1.4	3	2	NA		<1	U	<1	U	NA		Yes
Barium	1,000	2,000	10	NA		114		NA		NA		Yes
SEMI-VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		
1,4-Dioxane**	NA	134.2	NA	NA		24.6	J	NA		NA		Yes

Notes:

µg/L - micrograms per liter

DVQ - data validation qualifier

GWTP - Groundwater Treatment Plant

Grab samples are compared to the daily maximum and composite samples to the daily average

* Selenium reporting limit exceeds the daily average discharge limit.

** Calculated Effluent Limit

J - estimated concentration

MAL - minimum analytical level

mg/L - milligrams per liter

NA - not applicable

ROD - Record of Decision

U - non detect

Table 2-6: Quarterly GWTP Analytical Sampling Results for the 1st Quarter 2017

Sample Location Sample Identification Sample Date Sample Type				EFFLUENT		INFLUENT		Does Concentration Meet Discharge Limits? (Yes/No)
				LH18/24-SP650-6428		LH18/24-SP140-7428		
				29-Mar-17		29-Mar-17		
				GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	MAL					
VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		
1,1,1-Trichloroethane	3,417	7,230	10	<0.5	U	<25	U	Yes
1,1,2-Trichloroethane	102.5	216.9	10	<0.5	U	<25	U	Yes
1,1-Dichloroethane	6,633	14,032	10	<0.25	U	7.73	J	Yes
1,1-Dichloroethene	119	253	NA	<1	U	55.6	J	Yes
1,2-Dichloroethane	85	181	10	<0.5	U	31.6	J	Yes
Acetone	1,132	2,395	NA	9.07	J	<250	U	Yes
Benzene	85	181	10	<0.25	U	<12.5	U	Yes
Carbon Tetrachloride	85	181	10	<0.5	U	<25	U	Yes
Chloroform	1,708	3,615	10	<0.25	U	12.6	J	Yes
Ethylbenzene	26,954	57,025	10	<0.5	U	<25	U	Yes
m,p-Xylenes	39.5	83.6	NA	<1	U	<50	U	Yes
Methylene Chloride	803	1,699	20	1.04		3,950		Yes
o-Xylene	39.5	83.6	NA	<0.5	U	<25	U	Yes
Styrene	2,829	5,987	NA	<0.25	U	<12.5	U	Yes
Tetrachloroethene	85.4	180.7	10	<0.5	U	<25	U	Yes
Toluene	1,980	4,189	10	<0.5	U	<25	U	Yes
Trichloroethene	85	181	10	3.74		4,920		Yes
Vinyl Chloride	34	72	10	<0.5	U	212		Yes
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		
Chloride	NA	NA	NA	2,580		1,110		NA
Sulfate	NA	NA	NA	91.1		61.8		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		
Perchlorate	6	13	2	3.86		9,540.0		Yes
METALS	µg/L	µg/L	µg/L	µg/L		µg/L		
Aluminum	777	1,644	20	<200	U	463		Yes
Antimony	NA	NA	NA	1.07	J	<1	U	NA
Arsenic	365	772	10	<1	U	4.87		Yes
Barium	1,000	2,000	10	187		921		Yes
Cadmium	1.6	3.4	1	<0.6	U	2		Yes
Chromium	355	752	5	12.5		43.6		Yes
Cobalt	5,433	11,495	NA	4.67		27.7		Yes
Iron	1,132	2,395	NA	682		12,100		Yes
Lead	2.2	4.6	5	<1	U	1.61	J	Yes
Manganese	7,323	15,494	NA	111		1,570		Yes

Table 2-6: Quarterly GWTP Analytical Sampling Results for the 1st Quarter 2017

Sample Location Sample Identification Sample Date Sample Type				EFFLUENT		INFLUENT		Does Concentration Meet Discharge Limits? (Yes/No)
				LH18/24-SP650-6428		LH18/24-SP140-7428		
				29-Mar-17		29-Mar-17		
				GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	MAL					
Nickel	87	184	10	17.2		50		Yes
Selenium*	5.7	12	5	<20	U	<20	U	Yes
Silver	1.4	3	2	<1	U	<1	U	Yes
Thallium	NA	NA	NA	<0.2	U	0.141	J	NA
Vanadium	1,698	3,592	NA	<1	U	1.91	J	Yes
Zinc	146	310	5	72.7		726		Yes
1,4-Dioxane	µg/L	µg/L	µg/L	µg/L		µg/L		
1,4-Dioxane	NA	134.4	2	19.80	J	22.5	J	Yes
	mg/L	mg/L	mg/L	mg/L		mg/L		
Chemical Oxygen Demand	NA	200	NA	807		44.2		No
Oil and Grease	NA	15	NA	<2.8	U	<2.8	U	Yes

Notes:

µg/L - micrograms per liter

GWTP - Groundwater Treatment Plant

MAL - minimum analytical level

NA - not applicable

U - non detect

DVQ - data validation qualifier

J - Estimated concentration

mg/L - milligrams per liter

ROD - Record of Decision

Grab samples are compared to the daily maximum and composite samples to the daily average

* Selenium reporting limit exceeds the daily average concentration and the daily maximum concentration

3 EVALUATION OF LHAAP-16 EXTRACTION SYSTEM

No groundwater was extracted from LHAAP-16 during the 1st Quarter 2017 because there was no room to store and treat extracted groundwater while the GWTP was recovering from the acid spill. The volume of extracted groundwater from LHAAP-16 is shown in **Figure ES-1**.

3.1 Quantity of Groundwater Extracted from LHAAP-16

The quantity of groundwater extracted on a monthly basis is presented on **Table 3-1**. These flows are based on the sum of individual flow meter readings.

3.2 Groundwater Elevation

The groundwater elevations in the piezometers and monitoring wells at LHAAP-16 for January, February, and March 2017 are presented on **Table 3-2**. The potentiometric surface maps for the shallow and Upper Wilcox (intermediate) groundwater zones at LHAAP-16 for January, February, and March 2017 are presented in **Figures B-7 through B-12** in **Appendix B**. Based on the potentiometric surface maps, the general groundwater flow direction in the Shallow and Intermediate zone is towards south-east.

Table 3-1: Groundwater Extraction Quantities from LHAAP-16 (gallons)

Jan-17	Feb-17	Mar-17
0	0	0

Table 3-2: Groundwater Elevations at LHAAP-16 Piezometers and Monitoring Wells**PIEZOMETER LEVELS**

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16PZ-1	01/11/2017	199.44	27.80	171.64
16PZ-2	01/11/2017	199.75	28.23	171.52
16PZ-3	01/11/2017	198.61	26.95	171.66
16PZ-4	01/11/2017	198.81	27.34	171.47
16PZ-5	01/11/2017	198.31	26.68	171.63
16PZ-6	01/11/2017	198.61	27.23	171.38
16PZ-7	01/11/2017	200.10	28.12	171.98
16PZ-8	01/11/2017	199.93	28.38	171.55
16PZ-9	01/11/2017	196.49	25.24	171.25
16PZ-10	01/11/2017	196.65	25.37	171.28
16PZ-11	01/11/2017	198.88	27.14	171.74
16PZ-12	01/11/2017	199.00	27.45	171.55
16PZ-13	01/11/2017	196.58	24.92	171.66
16PZ-14	01/11/2017	196.09	24.63	171.46
16PZ-15	01/11/2017	191.93	20.38	171.55
16PZ-16	01/11/2017	190.79	19.55	171.24
16PZ-17	01/11/2017	186.67	16.00	170.67
16PZ-18	01/11/2017	185.99	15.11	170.88
16PZ-19	01/11/2017	183.98	13.34	170.64
16PZ-20	01/11/2017	183.12	12.06	171.06

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16WW12	01/11/2017	188.81	17.61	171.20
16WW14	01/11/2017	198.87	26.13	172.74
16WW22	01/11/2017	200.13	28.43	171.70
16WW25	01/11/2017	188.77	17.62	171.15
16WW26	01/11/2017	188.83	17.76	171.07
16WW29	01/11/2017	178.24	7.31	170.93
16WW30	01/11/2017	178.47	7.59	170.88
16WW31	01/11/2017	202.78	30.78	172.00
16WW33	01/11/2017	203.09	30.78	172.31
16WW35	01/11/2017	191.23	18.83	172.40
16WW36	01/11/2017	190.94	18.35	172.59

Table 3-2: Groundwater Elevations at LHAAP-16 Piezometers and Monitoring Wells**PIEZOMETER LEVELS**

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16PZ-1	02/13/2017	199.44	27.33	172.11
16PZ-2	02/13/2017	199.75	27.80	171.95
16PZ-3	02/13/2017	198.61	26.51	172.10
16PZ-4	02/13/2017	198.81	26.92	171.89
16PZ-5	02/13/2017	198.31	26.24	172.07
16PZ-6	02/13/2017	198.61	26.81	171.80
16PZ-7	02/13/2017	200.10	27.73	172.37
16PZ-8	02/13/2017	199.93	27.98	171.95
16PZ-9	02/13/2017	196.49	24.82	171.67
16PZ-10	02/13/2017	196.65	24.92	171.73
16PZ-11	02/13/2017	198.88	26.73	172.15
16PZ-12	02/13/2017	199.00	27.03	171.97
16PZ-13	02/13/2017	196.58	24.51	172.07
16PZ-14	02/13/2017	196.09	24.21	171.88
16PZ-15	02/13/2017	191.93	19.94	171.99
16PZ-16	02/13/2017	190.79	19.17	171.62
16PZ-17	02/13/2017	186.67	15.09	171.58
16PZ-18	02/13/2017	185.99	14.72	171.27
16PZ-19	02/13/2017	183.98	12.55	171.43
16PZ-20	02/13/2017	183.12	11.73	171.39

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16WW12	02/13/2017	188.81	17.35	171.46
16WW14	02/13/2017	198.87	25.86	173.01
16WW22	02/13/2017	200.13	28.00	172.13
16WW25	02/13/2017	188.77	16.83	171.94
16WW26	02/13/2017	188.83	17.44	171.39
16WW29	02/13/2017	178.24	6.53	171.71
16WW30	02/13/2017	178.47	6.79	171.68
16WW31	02/13/2017	202.78	30.34	172.44
16WW33	02/13/2017	203.09	30.39	172.70
16WW35	02/13/2017	191.23	18.52	172.71
16WW36	02/13/2017	190.94	18.03	172.91

Table 3-2: Groundwater Elevations at LHAAP-16 Piezometers and Monitoring Wells**PIEZOMETER LEVELS**

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16PZ-1	03/14/2017	199.44	27.09	172.35
16PZ-2	03/14/2017	199.75	27.57	172.18
16PZ-3	03/14/2017	198.61	26.27	172.34
16PZ-4	03/14/2017	198.81	26.69	172.12
16PZ-5	03/14/2017	198.31	26.00	172.31
16PZ-6	03/14/2017	198.61	26.58	172.03
16PZ-7	03/14/2017	200.10	27.49	172.61
16PZ-8	03/14/2017	199.93	27.71	172.22
16PZ-9	03/14/2017	196.49	24.48	172.01
16PZ-10	03/14/2017	196.65	24.68	171.97
16PZ-11	03/14/2017	198.88	26.52	172.36
16PZ-12	03/14/2017	199.00	26.81	172.19
16PZ-13	03/14/2017	196.58	24.30	172.28
16PZ-14	03/14/2017	196.09	23.99	172.10
16PZ-15	03/14/2017	191.93	19.65	172.28
16PZ-16	03/14/2017	190.79	18.92	171.87
16PZ-17	03/14/2017	186.67	14.58	172.09
16PZ-18	03/14/2017	185.99	14.42	171.57
16PZ-19	03/14/2017	183.98	12.03	171.95
16PZ-20	03/14/2017	183.12	11.35	171.77

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
16WW12	03/14/2017	188.81	17.06	171.75
16WW14	03/14/2017	198.87	25.66	173.21
16WW22	03/14/2017	200.13	27.78	172.35
16WW25	03/14/2017	188.77	16.28	172.49
16WW26	03/14/2017	188.83	17.17	171.66
16WW29	03/14/2017	178.24	6.01	172.23
16WW30	03/14/2017	178.47	6.26	172.21
16WW31	03/14/2017	202.78	30.16	172.62
16WW33	03/14/2017	203.09	30.22	172.87
16WW35	03/14/2017	191.23	18.32	172.91
16WW36	03/14/2017	190.94	17.81	173.13

Notes:

amsl - above mean sea level

4 GROUNDWATER MONITORING AT LHAAP-18/24

Water levels from 95 monitoring wells and 11 piezometers (piezometer 12 was damaged and plugged and abandoned in May 2013) are measured monthly to generate potentiometric surface maps that assist in monitoring the effectiveness of the groundwater extraction system on plume containment. The groundwater contours are generated using the water levels from the shallow zone and Wilcox Formation wells. The water level data are presented in **Table 4-1**. No re-injection of treated groundwater or reinjection to LHAAP-18/24 grounds via the existing irrigation system occurred during the 1st Quarter 2017. Discharge to Harrison Bayou occurring during March of the quarter. Potentiometric surface maps are presented in **Appendix B** and groundwater elevations from the 1st Quarter 2017 are discussed in **Section 2.2**.

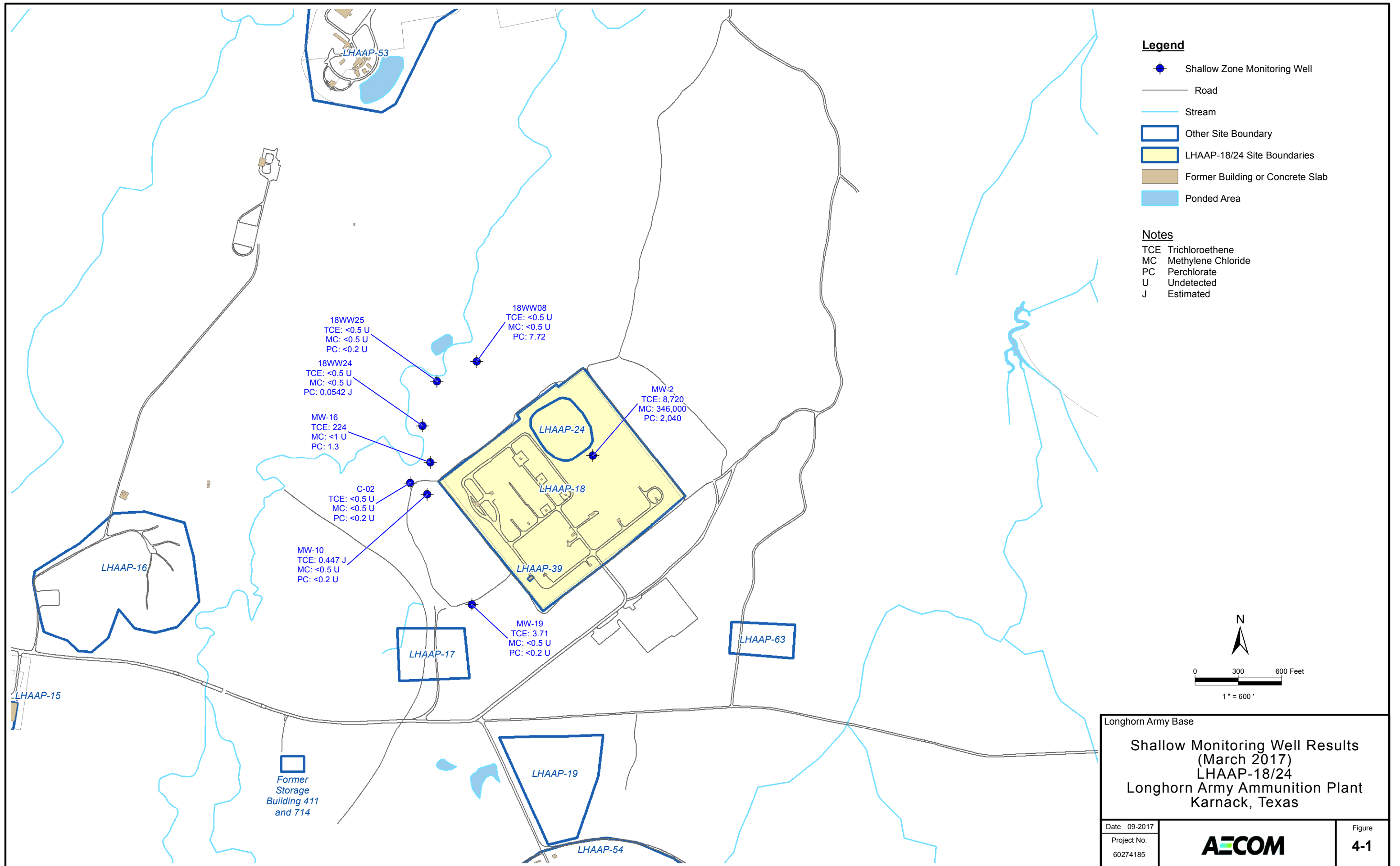
Nine Shallow and 4 Wilcox zone monitoring wells were sampled in March 2017 in lieu of collecting samples from the ICT's: The shallow zone monitoring wells that were sampled are 126, 18WW08, 18WW24, 18WW25, CO2, MW2, MW10, MW16, and MW19 and Wilcox zone monitoring wells that were sampled are MW13, 18CPTMW01DW, 18CPTMW01SW, and 18CPTMW23SW. The analytical results are presented in **Table 4-2**. Groundwater chemicals of concern (CoC) maps depicting the results of the March 2017 groundwater sampling event for trichloroethene (TCE), methylene chloride (MC), and perchlorate for Shallow and Wilcox zones are presented as **Figures 4-1 and 4-2**. Parameters exceeding their respective Maximum Contaminant Levels (MCL) or Protective Concentration Levels (PCLs) are arsenic, barium, chromium, lead, manganese, perchlorate, 1,2-dichloroethane, benzene, cis-1,2-dichloroethene, methylene chloride (MC), and trichloroethene (TCE).

In the shallow zone, the following metals were reported at levels above their respective MCLs. Arsenic was reported above the MCL in MW19F, with a concentration of 0.0186 mg/L, which is slightly higher than the MCL of 0.01 mg/L. Barium was reported above the MCL in 126F, 126FDF (field duplicate) and MW2 with concentrations of 9.98 mg/L, 9.7 mg/L, and 2.98 mg/L, respectively; higher than the MCL of 2 mg/L. Chromium was reported above the MCL of 0.1 mg/L in MW19F with a concentration of 0.184 mg/L. Lead was reported above the MCL of 0.015 mg/L in MW19F with a concentration of 0.053 mg/L. Manganese was reported above the MCL of 1.1 mg/L in 18WW25F, CO2F, MW2, and MW19F with concentrations of 3.02, 1.43, 3.45, and 1.85 mg/L, respectively. Perchlorate was reported above the MCL of 17 µg/L in MW2 with a concentration of 2,040 µg/L in March 2017, which was higher than the reported concentration of 1,290 µg/L in December 2016.

The following VOCs were reported at levels above their respective MCLs in the shallow zone. 1,2-Dichloroethane was measured above the MCL of 5 µg/L in MW16 at a concentration of 32.6 µg/L in March 2017, which was slightly higher than the reported concentration of 30.8 µg/L in December 2016. Cis-1,2-Dichloroethene was reported above the MCL of 70 µg/L in MW2 at a concentration of 38,600 µg/L in March 2017, which is higher than the December 2016 concentration of 31,500 µg/L. MC was reported above the MCL of 5 µg/L in MW2 at a concentration of 346,000 µg/L in March 2017, which was a higher concentration than the December 2016 result of 184,000 µg/L. TCE was reported above the MCL of 5 µg/L in MW2 and MW16 at concentrations of 8,720 and 224 µg/L, respectively, in March 2017. The concentration of TCE in MW2 and MW16 was less than the reported values of 11,800, and 460 µg/L, respectively, in December 2016.

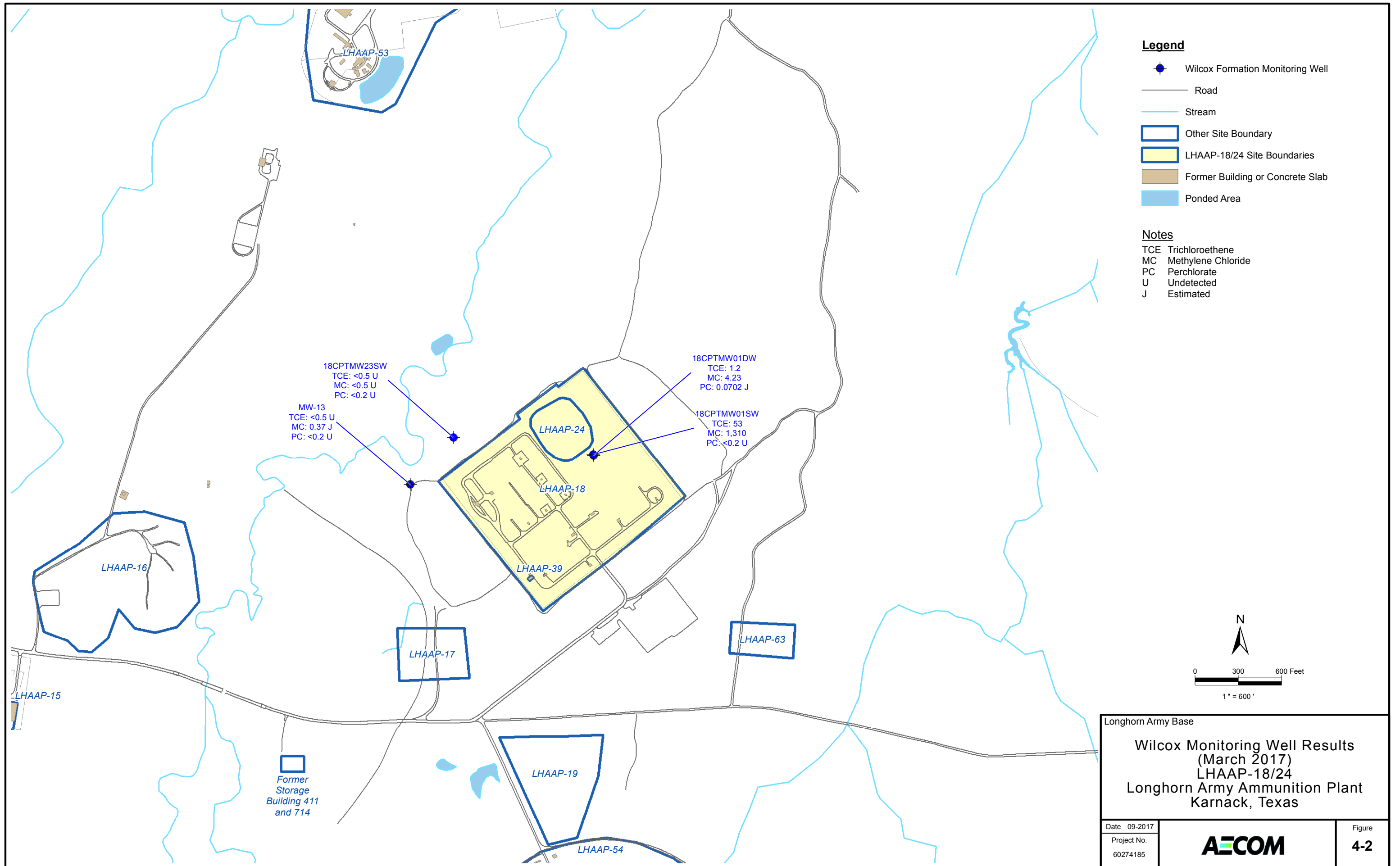
In the Wilcox zone, the following metals were reported at levels above their respective MCLs. Arsenic was reported above the MCL in 18CPTMW01SW with a concentration of 0.0169 mg/L, which is slightly higher than the MCL of 0.01 mg/L. Manganese was reported above the MCL of 1.1 mg/L in MW13, and MW13FD (field duplicate) with concentrations of 1.36 and 1.35 mg/L, respectively.

The following VOCs were reported at levels above their respective MCLs in the Wilcox zone. Benzene was recorded in 18CPTMW01SW at a concentration of 6 J µg/L in March 2017, which was higher than the MCL of 5 µg/L. MC was reported above the MCL of 5 µg/L in 18CPTMW01SW at a concentration of 1,310 µg/L in March 2017. 18CPTMW01SW had a lower concentration of MC in March 2017 than the December 2016 result of 1,590 µg/L. TCE was reported above the MCL of 5 µg/L in 18CPTMW01SW at a concentration of 53 µg/L in March 2017. The concentration of TCE in 18CPTMW01SW was less than the reported value of 78 µg/L in December 2016.



Longhorn Army Base
 Shallow Monitoring Well Results
 (March 2017)
 LHAAP-18/24
 Longhorn Army Ammunition Plant
 Karnack, Texas

Date 09-2017	AECOM	Figure
Project No. 60274185		4-1



Longhorn Army Base

Wilcox Monitoring Well Results
(March 2017)
LHAAP-18/24
Longhorn Army Ammunition Plant
Karnack, Texas

Date	09-2017	AECOM	Figure 4-2
Project No.	60274185		

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

PIEZOMETER LEVELS

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
BGPZ-1	01/12/2017	184.99	5.58	179.41
BGPZ-2	01/12/2017	184.39	15.11	169.28
BGPZ-3	01/12/2017	180.35	11.74	168.61
BGPZ-4	01/12/2017	177.77	8.58	169.19
BGPZ-5	01/12/2017	180.76	12.55	168.21
BGPZ-6	01/12/2017	197.82	28.32	169.50
BGPZ-7	01/12/2017	195.96	27.44	168.52
BGPZ-8	01/12/2017	197.08	28.89	168.19
BGPZ-9	01/12/2017	196.45	27.34	169.11
BGPZ-10	01/12/2017	197.00	27.61	169.39
BGPZ-11	01/12/2017	196.99	26.58	170.41
BGPZ-12	01/12/2017	188.17	NA	Plugged

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
AWD-1	01/12/2017	182.27	9.09	173.18
AWD-2	01/12/2017	186.78	12.52	174.26
AWD-3	01/12/2017	200.13	28.05	172.08
AWD-4	01/12/2017	193.89	24.12	169.77
MW-1	01/12/2017	199.22	27.40	171.82
MW-2	01/12/2017	196.73	26.41	170.32
MW-3	01/12/2017	196.54	27.15	169.39
MW-4	01/12/2017	197.27	26.90	170.37
MW-5	01/12/2017	194.97	25.80	169.17
MW-6	01/12/2017	192.18	23.11	169.07
MW-7	01/12/2017	188.47	18.45	170.02
MW-8	01/12/2017	187.13	17.11	170.02
MW-9	01/12/2017	184.73	14.91	169.82
MW-10	01/12/2017	178.12	9.27	168.85
MW-11	01/12/2017	184.65	15.53	169.12
MW-12	01/12/2017	178.33	9.40	168.93
MW-13	01/12/2017	176.72	7.69	169.03
MW-14	01/12/2017	186.19	13.89	172.30
MW-16	01/12/2017	178.59	9.74	168.85
MW-17	01/12/2017	179.03	10.57	168.46
MW-18	01/12/2017	178.58	9.38	169.20
MW-19	01/12/2017	178.60	9.11	169.49
MW-20	01/12/2017	186.64	11.85	174.79
MW-21	01/12/2017	198.70	30.22	168.48
MW-22	01/12/2017	197.51	28.01	169.50
MW-23	01/12/2017	198.79	28.18	170.61
101	01/12/2017	197.53	4.93	192.60
102	01/12/2017	193.94	21.74	172.20
109	01/12/2017	197.02	28.19	168.83
120	01/12/2017	184.19	12.07	172.12
123	01/12/2017	186.21	10.75	175.46
125	01/12/2017	196.28	25.76	170.52
126	01/12/2017	199.37	29.56	169.81
129	01/12/2017	197.24	25.84	171.40

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
130	01/12/2017	177.73	7.31	170.42
C-01	01/12/2017	193.89	24.28	169.61
C-02	01/12/2017	175.95	6.58	169.37
C-03	01/12/2017	196.34	27.35	168.99
C-04	01/12/2017	194.64	25.93	168.71
C-04A	01/12/2017	194.61	25.94	168.67
C-05	01/12/2017	180.74	13.36	167.38
C-06	01/12/2017	192.22	25.66	166.56
C-07	01/12/2017	196.80	27.73	169.07
C-08	01/12/2017	193.10	24.34	168.76
C-09	01/12/2017	202.35	33.12	169.23
C-10	01/12/2017	201.86	32.41	169.45
17WW08	01/12/2017	179.72	10.38	169.34
18WW01	01/12/2017	201.31	31.35	169.96
18WW02	01/12/2017	179.30	10.18	169.12
18WW03	01/12/2017	195.59	26.85	168.74
18WW04	01/12/2017	183.74	16.71	167.03
18WW05	01/12/2017	189.59	22.91	166.68
18WW06	01/12/2017	179.70	10.79	168.91
18WW07	01/12/2017	183.67	5.09	178.58
18WW08	01/12/2017	177.77	9.13	168.64
18WW09	01/12/2017	177.51	8.82	168.69
18WW10	01/12/2017	182.26	13.92	168.34
18WW11	01/12/2017	182.29	13.30	168.99
18WW14	01/12/2017	186.47	17.59	168.88
18WW15	01/12/2017	186.24	17.28	168.96
18WW16	01/12/2017	201.88	31.80	170.08
18WW18	01/12/2017	196.82	28.10	168.72
18WW19	01/12/2017	179.56	11.67	167.89
18WW20	01/12/2017	180.42	12.53	167.89
18WW21	01/12/2017	195.20	27.03	168.17
18WW22	01/12/2017	195.37	26.70	168.67
18WW24	01/12/2017	176.40	6.56	169.84
18WW25	01/12/2017	175.15	6.28	168.87
18CPTMW01SW	01/12/2017	198.20	28.29	169.91
18CPTMW01DW	01/12/2017	197.92	29.50	168.42
18CPTMW03SW	01/12/2017	198.53	29.58	168.95
18CPTMW04	01/12/2017	196.60	24.35	172.25
18CPTMW04SW	01/12/2017	196.42	27.50	168.92
18CPTMW06	01/12/2017	198.12	29.20	168.92
18CPTMW07	01/12/2017	197.32	28.48	168.84
18CPTMW08SW	01/12/2017	196.38	27.80	168.58
18CPTMW08DW	01/12/2017	196.59	27.75	168.84
18CPTMW10SW	01/12/2017	186.98	17.94	169.04
18CPTMW10DW	01/12/2017	187.38	18.42	168.96
18CPTMW12SW	01/12/2017	190.90	21.78	169.12
18CPTMW12DW	01/12/2017	190.25	21.19	169.06
18CPTMW14	01/12/2017	196.69	27.50	169.19

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
18CPTMW15	01/12/2017	179.79	10.81	168.98
18CPTMW16	01/12/2017	175.37	6.63	168.74
18CPTMW18	01/12/2017	194.53	27.21	167.32
18CPTMW19	01/12/2017	193.59	24.26	169.33
18CPTMW19SW	01/12/2017	193.29	24.55	168.74
18CPTMW22SW	01/12/2017	187.79	18.81	168.98
18CPTMW22R	01/12/2017	187.23	12.00	175.23
18CPTMW22DW	01/12/2017	185.24	18.85	166.39
18CPTMW23	01/12/2017	177.47	8.65	168.82
18CPTMW23SW	01/12/2017	177.43	8.46	168.97
18CPTMW24	01/12/2017	194.89	26.79	168.10
18CPTMW26	01/12/2017	182.80	16.68	166.12
18CPTMW26SW	01/12/2017	182.00	12.75	169.25

HARRISON BAYOU SURFACE WATER ELEVATION

Harrison Bayou	Date	Reference Elevation (feet amsl)	Staff Reading (water depth) (feet)	Surface Water Elevation (feet amsl)
1824HBSW7	01/12/2017	167.92	0.50	168.42

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

PIEZOMETER LEVELS

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
BGPZ-1	02/15/2017	184.99	4.96	180.03
BGPZ-2	02/15/2017	184.39	14.34	170.05
BGPZ-3	02/15/2017	180.35	10.00	170.35
BGPZ-4	02/15/2017	177.77	7.20	170.57
BGPZ-5	02/15/2017	180.76	11.18	169.58
BGPZ-6	02/15/2017	197.82	27.92	169.90
BGPZ-7	02/15/2017	195.96	27.25	168.71
BGPZ-8	02/15/2017	197.08	28.52	168.56
BGPZ-9	02/15/2017	196.45	27.05	169.40
BGPZ-10	02/15/2017	197.00	27.51	169.49
BGPZ-11	02/15/2017	196.99	26.15	170.84
BGPZ-12	02/15/2017	188.17	NA	Plugged

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
AWD-1	02/15/2017	182.27	8.46	173.81
AWD-2	02/15/2017	186.78	12.67	174.11
AWD-3	02/15/2017	200.13	27.71	172.42
AWD-4	02/15/2017	193.89	23.61	170.28
MW-1	02/15/2017	199.22	26.92	172.30
MW-2	02/15/2017	196.73	26.00	170.73
MW-3	02/15/2017	196.54	26.59	169.95
MW-4	02/15/2017	197.27	26.53	170.74
MW-5	02/15/2017	194.97	25.21	169.76
MW-6	02/15/2017	192.18	22.45	169.73
MW-7	02/15/2017	188.47	18.07	170.40
MW-8	02/15/2017	187.13	16.80	170.33
MW-9	02/15/2017	184.73	14.43	170.30
MW-10	02/15/2017	178.12	8.54	169.58
MW-11	02/15/2017	184.65	13.73	170.92
MW-12	02/15/2017	178.33	8.51	169.82
MW-13	02/15/2017	176.72	6.82	169.90
MW-14	02/15/2017	186.19	13.23	172.96
MW-16	02/15/2017	178.59	8.55	170.04
MW-17	02/15/2017	179.03	9.81	169.22
MW-18	02/15/2017	178.58	8.59	169.99
MW-19	02/15/2017	178.60	8.22	170.38
MW-20	02/15/2017	186.64	11.64	175.00
MW-21	02/15/2017	198.70	29.99	168.71
MW-22	02/15/2017	197.51	28.83	168.68
MW-23	02/15/2017	198.79	27.97	170.82
101	02/15/2017	197.53	4.26	193.27
102	02/15/2017	193.94	21.10	172.84
109	02/15/2017	197.02	27.92	169.10
120	02/15/2017	184.19	11.27	172.92
123	02/15/2017	186.21	10.61	175.60
125	02/15/2017	196.28	25.36	170.92
126	02/15/2017	199.37	29.28	170.09
129	02/15/2017	197.24	25.35	171.89

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
130	02/15/2017	177.73	6.88	170.85
C-01	02/15/2017	193.89	23.96	169.93
C-02	02/15/2017	175.95	5.87	170.08
C-03	02/15/2017	196.34	26.88	169.46
C-04	02/15/2017	194.64	25.39	169.25
C-04A	02/15/2017	194.61	25.30	169.31
C-05	02/15/2017	180.74	12.65	168.09
C-06	02/15/2017	192.22	25.21	167.01
C-07	02/15/2017	196.80	27.47	169.33
C-08	02/15/2017	193.10	24.11	168.99
C-09	02/15/2017	202.35	32.85	169.50
C-10	02/15/2017	201.86	32.29	169.57
17WW08	02/15/2017	179.72	10.00	169.72
18WW01	02/15/2017	201.31	31.18	170.13
18WW02	02/15/2017	179.30	9.08	170.22
18WW03	02/15/2017	195.59	26.47	169.12
18WW04	02/15/2017	183.74	15.97	167.77
18WW05	02/15/2017	189.59	22.37	167.22
18WW06	02/15/2017	179.70	9.77	169.93
18WW07	02/15/2017	183.67	5.70	177.97
18WW08	02/15/2017	177.77	8.50	169.27
18WW09	02/15/2017	177.51	8.07	169.44
18WW10	02/15/2017	182.26	13.05	169.21
18WW11	02/15/2017	182.29	12.52	169.77
18WW14	02/15/2017	186.47	17.26	169.21
18WW15	02/15/2017	186.24	17.88	168.36
18WW16	02/15/2017	201.88	31.90	169.98
18WW18	02/15/2017	196.82	27.65	169.17
18WW19	02/15/2017	179.56	10.70	168.86
18WW20	02/15/2017	180.42	11.56	168.86
18WW21	02/15/2017	195.20	26.60	168.60
18WW22	02/15/2017	195.37	26.22	169.15
18WW24	02/15/2017	176.40	5.70	170.70
18WW25	02/15/2017	175.15	5.67	169.48
18CPTMW01SW	02/15/2017	198.20	27.70	170.50
18CPTMW01DW	02/15/2017	197.92	28.22	169.70
18CPTMW03SW	02/15/2017	198.53	28.98	169.55
18CPTMW04	02/15/2017	196.60	23.85	172.75
18CPTMW04SW	02/15/2017	196.42	26.88	169.54
18CPTMW06	02/15/2017	198.12	28.60	169.52
18CPTMW07	02/15/2017	197.32	28.00	169.32
18CPTMW08SW	02/15/2017	196.38	26.80	169.58
18CPTMW08DW	02/15/2017	196.59	27.05	169.54
18CPTMW10SW	02/15/2017	186.98	17.32	169.66
18CPTMW10DW	02/15/2017	187.38	17.77	169.61
18CPTMW12SW	02/15/2017	190.90	21.26	169.64
18CPTMW12DW	02/15/2017	190.25	20.64	169.61
18CPTMW14	02/15/2017	196.69	27.16	169.53

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
18CPTMW15	02/15/2017	179.79	9.79	170.00
18CPTMW16	02/15/2017	175.37	5.69	169.68
18CPTMW18	02/15/2017	194.53	26.91	167.62
18CPTMW19	02/15/2017	193.59	23.96	169.63
18CPTMW19SW	02/15/2017	193.29	23.93	169.36
18CPTMW22SW	02/15/2017	187.79	18.40	169.39
18CPTMW22R	02/15/2017	187.23	10.97	176.26
18CPTMW22DW	02/15/2017	185.24	18.36	166.88
18CPTMW23	02/15/2017	177.47	7.33	170.14
18CPTMW23SW	02/15/2017	177.43	7.75	169.68
18CPTMW24	02/15/2017	194.89	26.48	168.41
18CPTMW26	02/15/2017	182.80	16.71	166.09
18CPTMW26SW	02/15/2017	182.00	12.34	169.66

HARRISON BAYOU SURFACE WATER ELEVATION

Harrison Bayou	Date	Reference Elevation (feet amsl)	Staff Reading (water depth) (feet)	Surface Water Elevation (feet amsl)
1824HBSW7	02/15/2017	167.92	0.85	168.77

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

PIEZOMETER LEVELS

Piezometers	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
BGPZ-1	03/14/2017	184.99	4.72	180.27
BGPZ-2	03/14/2017	184.39	14.07	170.32
BGPZ-3	03/14/2017	180.35	9.13	171.22
BGPZ-4	03/14/2017	177.77	5.66	172.11
BGPZ-5	03/14/2017	180.76	10.29	170.47
BGPZ-6	03/14/2017	197.82	27.72	170.10
BGPZ-7	03/14/2017	195.96	27.12	168.84
BGPZ-8	03/14/2017	197.08	28.41	168.67
BGPZ-9	03/14/2017	196.45	27.03	169.42
BGPZ-10	03/14/2017	197.00	27.20	169.80
BGPZ-11	03/14/2017	196.99	25.81	171.18
BGPZ-12	03/14/2017	188.17	NA	Plugged

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
AWD-1	03/15/2017	182.27	8.13	174.14
AWD-2	03/15/2017	186.78	12.32	174.46
AWD-3	03/15/2017	200.13	27.39	172.74
AWD-4	03/15/2017	193.89	23.36	170.53
MW-1	03/15/2017	199.22	26.60	172.62
MW-2	03/15/2017	196.73	25.71	171.02
MW-3	03/15/2017	196.54	26.25	170.29
MW-4	03/15/2017	197.27	26.22	171.05
MW-5	03/15/2017	194.97	24.89	170.08
MW-6	03/15/2017	192.18	22.16	170.02
MW-7	03/15/2017	188.47	17.65	170.82
MW-8	03/15/2017	187.13	16.70	170.43
MW-9	03/15/2017	184.73	14.22	170.51
MW-10	03/15/2017	178.12	8.16	169.96
MW-11	03/15/2017	184.65	12.21	172.44
MW-12	03/15/2017	178.33	7.87	170.46
MW-13	03/15/2017	176.72	6.57	170.15
MW-14	03/15/2017	186.19	12.93	173.26
MW-16	03/15/2017	178.59	7.95	170.64
MW-17	03/15/2017	179.03	9.48	169.55
MW-18	03/15/2017	178.58	8.25	170.33
MW-19	03/15/2017	178.60	7.89	170.71
MW-20	03/15/2017	186.64	11.17	175.47
MW-21	03/15/2017	198.70	29.65	169.05
MW-22	03/15/2017	197.51	28.50	169.01
MW-23	03/15/2017	198.79	27.65	171.14
101	03/15/2017	197.53	4.06	193.47
102	03/15/2017	193.94	20.77	173.17
109	03/15/2017	197.02	27.60	169.42
120	03/15/2017	184.19	10.95	173.24
123	03/15/2017	186.21	10.17	176.04
125	03/15/2017	196.28	25.07	171.21
126	03/15/2017	199.37	29.13	170.24
129	03/15/2017	197.24	25.03	172.21

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
130	03/15/2017	177.73	6.50	171.23
C-01	03/15/2017	193.89	23.65	170.24
C-02	03/15/2017	175.95	5.38	170.57
C-03	03/15/2017	196.34	26.54	169.80
C-04	03/15/2017	194.64	25.06	169.58
C-04A	03/15/2017	194.61	24.88	169.73
C-05	03/15/2017	180.74	12.16	168.58
C-06	03/15/2017	192.22	24.88	167.34
C-07	03/15/2017	196.80	27.25	169.55
C-08	03/15/2017	193.10	23.98	169.12
C-09	03/15/2017	202.35	32.71	169.64
C-10	03/15/2017	201.86	32.05	169.81
17WW08	03/15/2017	179.72	9.70	170.02
18WW01	03/15/2017	201.31	31.04	170.27
18WW02	03/15/2017	179.30	9.07	170.23
18WW03	03/15/2017	195.59	26.17	169.42
18WW04	03/15/2017	183.74	15.46	168.28
18WW05	03/15/2017	189.59	22.02	167.57
18WW06	03/15/2017	179.70	9.71	169.99
18WW07	03/15/2017	183.67	4.58	179.09
18WW08	03/15/2017	177.77	7.62	170.15
18WW09	03/15/2017	177.51	7.55	169.96
18WW10	03/15/2017	182.26	12.54	169.72
18WW11	03/15/2017	182.29	11.94	170.35
18WW14	03/15/2017	186.47	16.98	169.49
18WW15	03/15/2017	186.24	16.51	169.73
18WW16	03/15/2017	201.88	31.80	170.08
18WW18	03/15/2017	196.82	27.30	169.52
18WW19	03/15/2017	179.56	10.05	169.51
18WW20	03/15/2017	180.42	10.91	169.51
18WW21	03/15/2017	195.20	26.25	168.95
18WW22	03/15/2017	195.37	25.89	169.48
18WW24	03/15/2017	176.40	4.88	171.52
18WW25	03/15/2017	175.15	5.27	169.88
18CPTMW01SW	03/15/2017	198.20	27.37	170.83
18CPTMW01DW	03/15/2017	197.92	27.93	169.99
18CPTMW03SW	03/15/2017	198.53	28.64	169.89
18CPTMW04	03/15/2017	196.60	23.53	173.07
18CPTMW04SW	03/15/2017	196.42	26.55	169.87
18CPTMW06	03/15/2017	198.12	28.27	169.85
18CPTMW07	03/15/2017	197.32	27.64	169.68
18CPTMW08SW	03/15/2017	196.38	26.47	169.91
18CPTMW08DW	03/15/2017	196.59	26.71	169.88
18CPTMW10SW	03/15/2017	186.98	17.05	169.93
18CPTMW10DW	03/15/2017	187.38	17.48	169.90
18CPTMW12SW	03/15/2017	190.90	21.02	169.88
18CPTMW12DW	03/15/2017	190.25	20.39	169.86
18CPTMW14	03/15/2017	196.69	27.04	169.65

Table 4-1: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells and Surface Water

MONITORING WELL LEVELS

Monitoring Wells	Date	Reference Elevation (feet amsl)	Depth to Water (feet)	Groundwater Elevation (feet amsl)
18CPTMW15	03/15/2017	179.79	8.80	170.99
18CPTMW16	03/15/2017	175.37	5.07	170.30
18CPTMW18	03/15/2017	194.53	26.87	167.66
18CPTMW19	03/15/2017	193.59	23.75	169.84
18CPTMW19SW	03/15/2017	193.29	23.47	169.82
18CPTMW22SW	03/15/2017	187.79	18.20	169.59
18CPTMW22R	03/15/2017	187.23	10.25	176.98
18CPTMW22DW	03/15/2017	188.00	18.13	169.87
18CPTMW23	03/15/2017	177.47	6.34	171.13
18CPTMW23SW	03/15/2017	177.43	7.27	170.16
18CPTMW24	03/15/2017	194.89	26.35	168.54
18CPTMW26	03/15/2017	182.60	16.73	165.87
18CPTMW26SW	03/15/2017	182.00	12.16	169.84

HARRISON BAYOU SURFACE WATER ELEVATION

Harrison Bayou	Date	Reference Elevation (feet amsl)	Staff Reading (water depth) (feet)	Surface Water Elevation (feet amsl)
1824HBSW7	03/15/2017	167.92	1.00	168.92

Notes:

amsl - above mean sea level

NA - not applicable

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID: Sample Date:	Units	MCL/ PCL	126- 032117 3/21/2017	126F- 032117 3/21/2017	126FD- 032117 3/21/2017	126FDF- 032117 3/21/2017	18CPTMW01DW- 032117 3/21/2017	18CPTMW01SW- 032117 3/21/2017	18CPTMW23SW- 032017 3/20/2017	18WW08- 032017 3/20/2017	18WW24- 032017 3/20/2017	18WW25- 032017 3/20/2017	18WW25F- 032017 3/20/2017
Metals (6010C)													
Aluminum	mg/L	100	NA	<0.1 U	NA	<0.1 U	0.0828 J	<0.1 U	0.157 J	0.627	0.201	NA	<0.1 U
Beryllium	mg/L	0.004	NA	<0.01 U	NA	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	NA	<0.01 U
Calcium	mg/L		NA	312	NA	315	20.1	28	23.3	4.96	29.9	NA	23.1
Iron	mg/L		NA	1.96	NA	1.81	0.948 J	49.7	56.5	4.95	0.202	NA	13.2
Magnesium	mg/L		NA	244	NA	245	7.21 J	19.8 J	11.3	6.21	26.7	NA	13.5
Potassium	mg/L		NA	4.56	NA	4.51	64.8	5.44	2.75	0.862 J	0.966 J	NA	1.48 J
Selenium	mg/L	0.05	NA	<0.01 U	NA	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	NA	<0.01 U
Sodium	mg/L		NA	913	NA	909	265	97.3	80.9	147 J	575	NA	42.6
Metals (6020A)													
Antimony	mg/L	0.006	NA	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	0.000942 J	<0.001 U	NA	<0.001 U
Arsenic	mg/L	0.01	NA	0.00938	NA	0.00854	0.00576	0.0169	0.00342	0.00336	0.00362	NA	0.00168 J
Barium	mg/L	2	NA	9.98	NA	9.7	0.249	1.01	0.302	0.0734	0.0844	NA	0.307
Cadmium	mg/L	0.005	NA	0.000623 J	NA	0.000447 J	<0.0006 U	<0.0006 U	<0.0006 U	0.000397 J	<0.0006 U	NA	<0.0006 U
Chromium	mg/L	0.1	NA	0.00258 J	NA	0.0028 J	0.0184	<0.002 U	0.00112 J	0.0503	0.00226 J	NA	<0.002 U
Cobalt	mg/L	6.1	NA	0.0294	NA	0.0281	0.00121 J	0.00138 J	<0.001 U	0.0046	0.00287	NA	0.00425
Copper	mg/L	1.3	NA	0.00355 J	NA	0.00358 J	0.00196 J	0.0011 J	0.00123 J	0.00297 J	0.00276 J	NA	0.00129 J
Lead	mg/L	0.015	NA	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	0.00105 J	<0.001 U	NA	<0.001 U
Manganese	mg/L	1.1	NA	0.533	NA	0.505	0.122	0.639	0.792	0.164 J	0.276	NA	3.02
Nickel	mg/L	0.49	NA	0.0229	NA	0.0225	0.00467 J	0.00308 J	<0.004 U	0.00951	0.0135	NA	0.00229 J
Silver	mg/L	0.51	NA	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	<0.001 U
Thallium	mg/L	0.002	NA	0.000209 J	NA	0.00011 J	0.000174 J	0.000117 J	0.000309 J	0.000425	0.000179 J	NA	0.000255 J
Vanadium	mg/L	0.72	NA	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	0.000874 J	0.00526	<0.001 U	NA	<0.001 U
Zinc	mg/L	31	NA	0.0479 J	NA	0.0412 J	<0.025 U	<0.025 U	<0.025 U	0.022 J	0.0256 J	NA	<0.025 U
Perchlorate (6850)													
Perchlorate	µg/L	17	<0.2 U	NA	<0.2 U	NA	0.0702 J	<0.2 U	<0.2 U	7.72	0.0542 J	<0.2 U	NA
Mercury (7470A)													
Mercury	mg/L	0.002	NA	<0.0002 U	NA	<0.0002 U	0.0001 J	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U
Volatile Organic Compounds (8260B)													
1,1,1,2-Tetrachloroethane	µg/L	35	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,1,1-Trichloroethane	µg/L	200	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,1,2,2-Tetrachloroethane	µg/L	4.6	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
1,1,2-Trichloroethane	µg/L	5	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,1-Dichloroethane	µg/L	4,900	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
1,1-Dichloroethene	µg/L	7	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
1,1-Dichloropropene	µg/L	9.1	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,2,3-Trichlorobenzene	µg/L	73	<0.3 U	NA	<0.3 U	NA	<0.3 U	<3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	NA
1,2,3-Trichloropropane	µg/L	0.03	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
1,2,4-Trichlorobenzene	µg/L	70	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
1,2,4-Trimethylbenzene	µg/L	1,200	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,2-Dibromo-3-chloropropane	µg/L	0.2	<2 U	NA	<2 U	NA	<2 U	<20 U	<2 U	<2 U	<2 U	<2 U	NA
1,2-Dibromoethane	µg/L	0.05	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,2-Dichlorobenzene	µg/L	600	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
1,2-Dichloroethane	µg/L	5	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,2-Dichloropropane	µg/L	5	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
1,3,5-Trimethylbenzene	µg/L	1,200	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
1,3-Dichlorobenzene	µg/L	730	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID: Sample Date:	Units	MCL/ PCL	126- 032117 3/21/2017	126F- 032117 3/21/2017	126FD- 032117 3/21/2017	126FDF- 032117 3/21/2017	18CPTMW01DW- 032117 3/21/2017	18CPTMW01SW- 032117 3/21/2017	18CPTMW23SW- 032017 3/20/2017	18WW08- 032017 3/20/2017	18WW24- 032017 3/20/2017	18WW25- 032017 3/20/2017	18WW25F- 032017 3/20/2017
1,3-Dichloropropane	µg/L	9.1	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
1,4-Dichlorobenzene	µg/L	75	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
2,2-Dichloropropane	µg/L	13	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
2-Butanone	µg/L	15,000	<5 U	NA	<5 U	NA	<5 U	<50 U	<5 U	<5 U	<5 U	<5 U	NA
2-Chlorotoluene	µg/L	490	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
2-Hexanone	µg/L	120	<5 U	NA	<5 U	NA	<5 U	<50 U	<5 U	<5 U	<5 U	<5 U	NA
4-Chlorotoluene	µg/L	490	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
4-Methyl-2-pentanone	µg/L	2000	<5 U	NA	<5 U	NA	<5 U	<50 U	<5 U	<5 U	<5 U	<5 U	NA
Acetone	µg/L	22,000	4.46 J	NA	4.07 J	NA	<5 U	<50 U	10.9	10.3	6.95 J	4.48 J	NA
Benzene	µg/L	5	<0.25 U	NA	<0.25 U	NA	<0.25 U	6 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
Bromobenzene	µg/L	200	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
Bromochloromethane	µg/L	980	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
Bromodichloromethane	µg/L	15	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Bromoform	µg/L	120	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Bromomethane	µg/L	34	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Carbon disulfide	µg/L	2400	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Carbon tetrachloride	µg/L	5	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Chlorobenzene	µg/L	100	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
Chloroethane	µg/L	98,000	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Chloroform	µg/L	240	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
Chloromethane	µg/L	70	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
cis-1,2-Dichloroethene	µg/L	70	<0.5 U	NA	<0.5 U	NA	1	3.67 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
cis-1,3-Dichloropropene	µg/L	1.7	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Dibromochloromethane	µg/L	11	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Dibromomethane	µg/L	120	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Dichlorodifluoromethane	µg/L	4,900	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Ethylbenzene	µg/L	700	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Hexachlorobutadiene	µg/L	12	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Isopropylbenzene	µg/L	2,400	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
m,p-Xylene	µg/L	10,000	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Methylene chloride	µg/L	5	<0.5 U	NA	<0.5 U	NA	4.23	1,310	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Naphthalene	µg/L	490	<0.4 U	NA	<0.4 U	NA	<0.4 U	<4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	NA
n-Butylbenzene	µg/L	1,200	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
n-Propylbenzene	µg/L	980	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
o-xylene	µg/L	10,000	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
p-Isopropyltoluene	µg/L	2,400	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
sec-Butylbenzene	µg/L	980	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Styrene	µg/L	100	<0.25 U	NA	<0.25 U	NA	<0.25 U	<2.5 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	NA
tert-Butylbenzene	µg/L	980	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Tetrachloroethene	µg/L	5	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID: Sample Date:	Units	MCL/ PCL	126- 032117 3/21/2017	126F- 032117 3/21/2017	126FD- 032117 3/21/2017	126FDF- 032117 3/21/2017	18CPTMW01DW- 032117 3/21/2017	18CPTMW01SW- 032117 3/21/2017	18CPTMW23SW- 032017 3/20/2017	18WW08- 032017 3/20/2017	18WW24- 032017 3/20/2017	18WW25- 032017 3/20/2017	18WW25F- 032017 3/20/2017
Toluene	µg/L	1,000	<0.5 U	NA	<0.5 U	NA	<0.5 U	3.63 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
trans-1,2-Dichloroethene	µg/L	100	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
trans-1,3-Dichloropropene	µg/L	9.1	<1 U	NA	<1 U	NA	<1 U	<10 U	<1 U	<1 U	<1 U	<1 U	NA
Trichloroethene	µg/L	5	<0.5 U	NA	<0.5 U	NA	1.2	53	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Trichlorofluoromethane	µg/L	7,300	<0.5 U	NA	<0.5 U	NA	<0.5 U	32.2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA
Vinyl chloride	µg/L	2	<0.5 U	NA	<0.5 U	NA	<0.5 U	<5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA

Notes:

Location IDs containing "F" indicate sample filtered in the field with 10 micron filter.

Location IDs containing "FD" indicate duplicate samples.

Blue Highlighting Indicates Analyte Detected Above MCL/PCL

Note: Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

MCL - Maximum Contaminant Level

mg/L - milligrams per liter

NA - not analyzed

PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

U - Undetected: The analyte was analyzed for, but not detected.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

µg/L - micrograms per liter

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID:	Units	MCL/ PCL	CO2- 032117 3/21/2017	CO2F- 032117 3/21/2017	MW2- 032117 3/21/2017	MW10- 032017 3/20/2017	MW10F- 032017 3/20/2017	MW13- 032117 3/21/2017	MW13FD- 032117 3/21/2017	MW16- 032217 3/22/2017	MW16F- 032217 3/22/2017	MW19- 032217 3/22/2017	MW19F- 032217 3/22/2017
Sample Date:													
Metals (6010C)													
Aluminum	mg/L	100	NA	<0.1 U	<0.1 U	NA	<0.1 U	0.222	0.299	NA	0.164 J	NA	36.8
Beryllium	mg/L	0.004	NA	<0.01 U	<0.01 U	NA	<0.01 U	<0.01 U	<0.01 U	NA	<0.01 U	NA	<0.01 U
Calcium	mg/L		NA	17.1	77.3	NA	14	27.3	28.4	NA	22.1	NA	24.2
Iron	mg/L		NA	7.78	13.7	NA	23.2	93.2	87.4	NA	28	NA	59.2
Magnesium	mg/L		NA	10.6	59.1	NA	6.87	15.1 J	13.5 J	NA	12.4	NA	10.6 J
Potassium	mg/L		NA	3.24	3.63	NA	3.02	3.95	3.93	NA	3.65	NA	4.61
Selenium	mg/L	0.05	NA	<0.01 U	0.0105 J	NA	<0.01 U	<0.01 U	<0.01 U	NA	<0.01 U	NA	<0.01 U
Sodium	mg/L		NA	72.7	239	NA	55.4	97.1	94.5	NA	109	NA	96.4
Metals (6020A)													
Antimony	mg/L	0.006	NA	<0.001 U	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	NA	<0.001 U	NA	<0.001 U
Arsenic	mg/L	0.01	NA	0.00137 J	0.0086	NA	0.00159 J	0.00478	0.00449	NA	0.0065	NA	0.0186
Barium	mg/L	2	NA	0.874	2.98	NA	0.457	0.526	0.512	NA	0.471	NA	0.79
Cadmium	mg/L	0.005	NA	0.000345 J	0.000652 J	NA	0.000493 J	0.000419 J	0.000338 J	NA	0.000689 J	NA	0.00499
Chromium	mg/L	0.1	NA	<0.002 U	0.0176	NA	0.00111 J	0.0478	0.0519	NA	0.00787	NA	0.184
Cobalt	mg/L	6.1	NA	0.000518 J	0.0578	NA	0.00226	0.0018 J	0.00193 J	NA	0.00581	NA	0.0315
Copper	mg/L	1.3	NA	0.00171 J	0.00252 J	NA	0.00146 J	0.00599	0.00693	NA	0.00135 J	NA	0.0967
Lead	mg/L	0.015	NA	<0.001 U	<0.001 U	NA	<0.001 U	<0.001 U	0.000752 J	NA	<0.001 U	NA	0.053
Manganese	mg/L	1.1	NA	1.43	3.45	NA	0.534	1.36	1.35	NA	0.555	NA	1.85
Nickel	mg/L	0.49	NA	<0.004 U	0.0467	NA	0.0146	0.0665	0.0707	NA	0.0438	NA	0.128
Silver	mg/L	0.51	NA	<0.001 U	<0.001 U	NA	<0.001 U	<0.001 U	<0.001 U	NA	<0.001 U	NA	<0.001 U
Thallium	mg/L	0.002	NA	0.000133 J	<0.0002 U	NA	0.000221 J	0.000175 J	0.000113 J	NA	0.000107 J	NA	0.00108
Vanadium	mg/L	0.72	NA	<0.001 U	<0.001 U	NA	<0.001 U	0.00114 J	0.00174 J	NA	<0.001 U	NA	0.203
Zinc	mg/L	31	NA	0.0152 J	0.0967	NA	0.0186 J	0.0232 J	0.0244 J	NA	0.0206 J	NA	0.606
Perchlorate (6850)													
Perchlorate	µg/L	17	<0.2 U	NA	2,040	<0.2 U	NA	<0.2 U	<0.2 U	1.3	NA	<0.2 U	NA
Mercury (7470A)													
Mercury	mg/L	0.002	NA	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U	NA	0.000196 J
Volatile Organic Compounds (8260B)													
1,1,1,2-Tetrachloroethane	µg/L	35	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,1,1-Trichloroethane	µg/L	200	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,1,2,2-Tetrachloroethane	µg/L	4.6	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
1,1,2-Trichloroethane	µg/L	5	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,1-Dichloroethane	µg/L	4,900	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	0.797 J	NA	<0.25 U	NA
1,1-Dichloroethene	µg/L	7	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	4.44	NA	<1 U	NA
1,1-Dichloropropene	µg/L	9.1	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,2,3-Trichlorobenzene	µg/L	73	<0.3 U	NA	<300 U	<0.3 U	NA	<0.3 U	<0.3 U	<0.6 U	NA	<0.3 U	NA
1,2,3-Trichloropropane	µg/L	0.03	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
1,2,4-Trichlorobenzene	µg/L	70	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
1,2,4-Trimethylbenzene	µg/L	1,200	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,2-Dibromo-3-chloropropane	µg/L	0.2	<2 U	NA	<2,000 U	<2 U	NA	<2 U	<2 U	<4 U	NA	<2 U	NA
1,2-Dibromoethane	µg/L	0.05	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,2-Dichlorobenzene	µg/L	600	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
1,2-Dichloroethane	µg/L	5	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	32.6	NA	<0.5 U	NA
1,2-Dichloropropane	µg/L	5	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
1,3,5-Trimethylbenzene	µg/L	1,200	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
1,3-Dichlorobenzene	µg/L	730	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID: Sample Date:	Units	MCL/ PCL	CO2- 032117 3/21/2017	CO2F- 032117 3/21/2017	MW2- 032117 3/21/2017	MW10- 032017 3/20/2017	MW10F- 032017 3/20/2017	MW13- 032117 3/21/2017	MW13FD- 032117 3/21/2017	MW16- 032217 3/22/2017	MW16F- 032217 3/22/2017	MW19- 032217 3/22/2017	MW19F- 032217 3/22/2017
1,3-Dichloropropane	µg/L	9.1	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
1,4-Dichlorobenzene	µg/L	75	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
2,2-Dichloropropane	µg/L	13	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
2-Butanone	µg/L	15,000	<5 U	NA	<5,000 U	<5 U	NA	<5 U	<5 U	<10 U	NA	<5 U	NA
2-Chlorotoluene	µg/L	490	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
2-Hexanone	µg/L	120	<5 U	NA	<5,000 U	<5 U	NA	<5 U	<5 U	<10 U	NA	<5 U	NA
4-Chlorotoluene	µg/L	490	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
4-Methyl-2-pentanone	µg/L	2000	<5 U	NA	<5,000 U	<5 U	NA	<5 U	<5 U	<10 U	NA	<5 U	NA
Acetone	µg/L	22,000	4.33 J	NA	<5,000 U	7.8 J	NA	11.3	<5 U	7.45 J	NA	<5 U	NA
Benzene	µg/L	5	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
Bromobenzene	µg/L	200	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
Bromochloromethane	µg/L	980	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
Bromodichloromethane	µg/L	15	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Bromoform	µg/L	120	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Bromomethane	µg/L	34	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Carbon disulfide	µg/L	2400	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Carbon tetrachloride	µg/L	5	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Chlorobenzene	µg/L	100	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
Chloroethane	µg/L	98,000	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Chloroform	µg/L	240	<0.25 U	NA	135 J	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
Chloromethane	µg/L	70	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
cis-1,2-Dichloroethene	µg/L	70	<0.5 U	NA	38,600	<0.5 U	NA	<0.5 U	<0.5 U	14.7	NA	1.37	NA
cis-1,3-Dichloropropene	µg/L	1.7	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Dibromochloromethane	µg/L	11	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Dibromomethane	µg/L	120	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Dichlorodifluoromethane	µg/L	4,900	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Ethylbenzene	µg/L	700	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Hexachlorobutadiene	µg/L	12	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Isopropylbenzene	µg/L	2,400	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
m,p-Xylene	µg/L	10,000	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Methylene chloride	µg/L	5	<0.5 U	NA	346,000	<0.5 U	NA	0.37 J	0.401 J	<1 U	NA	<0.5 U	NA
Naphthalene	µg/L	490	<0.4 U	NA	<400 U	<0.4 U	NA	<0.4 U	<0.4 U	<0.8 U	NA	<0.4 U	NA
n-Butylbenzene	µg/L	1,200	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
n-Propylbenzene	µg/L	980	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
o-xylene	µg/L	10,000	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
p-Isopropyltoluene	µg/L	2,400	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
sec-Butylbenzene	µg/L	980	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Styrene	µg/L	100	<0.25 U	NA	<250 U	<0.25 U	NA	<0.25 U	<0.25 U	<0.5 U	NA	<0.25 U	NA
tert-Butylbenzene	µg/L	980	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Tetrachloroethene	µg/L	5	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA

Table 4-2: LHAAP-18/24 Sampling - March 2017

Location ID: Sample Date:	Units	MCL/ PCL	CO2- 032117 3/21/2017	CO2F- 032117 3/21/2017	MW2- 032117 3/21/2017	MW10- 032017 3/20/2017	MW10F- 032017 3/20/2017	MW13- 032117 3/21/2017	MW13FD- 032117 3/21/2017	MW16- 032217 3/22/2017	MW16F- 032217 3/22/2017	MW19- 032217 3/22/2017	MW19F- 032217 3/22/2017
Toluene	µg/L	1,000	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
trans-1,2-Dichloroethene	µg/L	100	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
trans-1,3-Dichloropropene	µg/L	9.1	<1 U	NA	<1,000 U	<1 U	NA	<1 U	<1 U	<2 U	NA	<1 U	NA
Trichloroethene	µg/L	5	<0.5 U	NA	8,720	0.447 J	NA	<0.5 U	<0.5 U	224	NA	3.71	NA
Trichlorofluoromethane	µg/L	7,300	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA
Vinyl chloride	µg/L	2	<0.5 U	NA	<500 U	<0.5 U	NA	<0.5 U	<0.5 U	<1 U	NA	<0.5 U	NA

Notes:

Location IDs containing "F" indicate sample filtered in the field with 10 micron filter.

Location IDs containing "FD" indicate duplicate samples.

Blue Highlighting Indicates Analyte Detected Above MCL/PCL

Note: Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

MCL - Maximum Contaminant Level

mg/L - milligrams per liter

NA - not analyzed

PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

U - Undetected: The analyte was analyzed for, but not detected.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

µg/L - micrograms per liter

5 QUALITY CONTROL

This report summarizes the data for samples collected during January, February, and March 2017. The samples were collected in accordance with the Sampling and Analysis Plan for the GWTP (United States Army Corps of Engineers [USACE], July 2007) that treats water from LHAAP-18/24 and LHAAP-16. The purpose of the sampling program is to evaluate the effectiveness of the groundwater pump and treat system, assess water quality within the capture zone, and assure compliance with the effluent discharge requirements of the Interim ROD. Quality control and quality assurance problems noted in the case narratives received from the laboratory are minor and do not affect the usability of the data for compliance at the GWTP. No sample results from the 1st Quarter 2017 were rejected due to quality control problems.

Microbac Laboratories (Microbac) analyzed the compliance samples collected from the GWTP. Independent data verification and validation was performed by the AECOM Technical Services, Inc. (AECOM) project chemist (**Appendix C**); the laboratory reports for the 1st Quarter 2017 are included in **Appendix C** on a CD.

6 TREATED GROUNDWATER DISCHARGED

Reinjection of groundwater in ICT 6 and ICT 9 was discontinued as of July 15, 2012. The last injection occurred on May 24, 2012, immediately prior to the scrubber system malfunction which caused GWTP operation to cease temporarily. Treated groundwater that met the perchlorate discharge criteria was discharged to Harrison Bayou at a rate that did not exceed the criteria concentrations for chloride and sulfate in surface water. Table 6-1 summarizes flow rates in Harrison Bayou, the maximum flow rate allowed by chloride and sulfate concentrations, and the actual flow rate discharged for March 2017. No treated groundwater was discharged to Harrison Bayou during January or February 2017.

Table 6-1: Treated Groundwater Discharged to Harrison Bayou

Date	Harrison Bayou Flow (gpm)	Maximum Rate Allowed (gpm)	Released From GWTP To Harrison Bayou (gpm)
03/01/2017	No Release	N/A	0.0
03/02/2017	No Release	N/A	0.0
03/03/2017	No Release	N/A	0.0
03/04/2017	No Release	N/A	0.0
03/05/2017	No Release	N/A	0.0
03/06/2017	No Release	N/A	0.0
03/07/2017	No Release	N/A	0.0
03/08/2017	No Release	N/A	0.0
03/09/2017	No Release	N/A	0.0
03/10/2017	No Release	N/A	0.0
03/11/2017	No Release	N/A	0.0
03/12/2017	No Release	N/A	0.0
03/13/2017	No Release	N/A	0.0
03/14/2017	No Release	N/A	0.0
03/15/2017	No Release	N/A	0.0
03/16/2017	No Release	N/A	0.0
03/17/2017	4381	87	0.3
03/18/2017	3602	72	8.2
03/19/2017	2092	41	11.3
03/20/2017	1774	35	15.0
03/21/2017	1510	30	13.7
03/22/2017	1284	25	11.9
03/23/2017	1068	21	6.7
03/24/2017	934	18	6.3
03/25/2017	10382	208	1.8
03/26/2017	FLOOD STAGE	MAXIMUM	7.0
03/27/2017	12573	252	6.2
03/28/2017	No Release	N/A	0.0
03/29/2017	No Release	N/A	0.0
03/30/2017	No Release	N/A	0.0
03/31/2017	No Release	N/A	0.0

gpm - gallons per minute

N/A - not applicable

7 AIR MONITORING

7.1 Summary of Air Monitoring Approach

Operation of the GWTP without air abatement was approved by the TCEQ and USEPA conditioned on collection of air monitoring data to determine the effect on GWTP operation on ambient air quality with respect to potential human health exposure risk. An Interim Air Monitoring Plan was developed by AECOM in August 2012 and used to implement the air monitoring program. The air monitoring program included sampling emission concentrations from the air stripper, ambient air at the GWTP, and ambient air downwind of the GWTP. Collection of air data occurred on a weekly basis between September 2012 and September 2013, on a monthly basis between September 2013 and September 2014, and on a quarterly basis since that time. The sampling program includes use of Summa canisters and a photoionization detector (PID) to measure vapor phase concentrations. The air stripper emission sample is collected as a grab sample, while the ambient air samples are collected as composite samples. The GWTP sample is collected over 8 hours to represent a work day and the downwind sample is collected over 24 hours to represent potential exposure to an off-site receptor¹. The downwind sample is collected at the closest downwind property boundary, based on prevailing wind direction.

PID data (after system calibration) are collected each time the GWTP is operated and serve as a real-time indicator of ambient air conditions at and downwind of the GWTP. Correlations between definitive analytical air data and PID measurements were established and a means to calculate contaminant concentration from PID measurements was developed. A PID threshold of 0.4 parts per million by volume (ppmv) in ambient air was established, such that Summa canister measurements would occur when the PID threshold is exceeded.

The Summa canister samples are analyzed for VOCs using USEPA Method TO-15. The PID measurements are collected after instrument calibration. The air sampling results are summarized and reported to the USEPA and TCEQ in the GWTP quarterly reports; however, the air results are reviewed immediately upon receipt for the potential presence of any exceedances of ambient air concentrations. The GWTP report includes a summary of analytical results and PID readings, calculations of emission rates from the emission point, comparison of ambient air concentrations with TCEQ Air Monitoring Comparison Values (AMCVs) or the short-term Effects Screening Levels (ESLs) for chemicals with no published AMCVs, and a compilation of PID results and calibration records. The air monitoring results to date indicate that all ambient air concentrations are lower than the AMCVs or ESLs. The stripper stack sample concentrations are used to calculate emission rates in pounds per hour (lbs/hr) and tons per year (tpy). The calculated emission rates in lbs/hr are then compared to the allowable emission rates per 30 Texas Administrative Code (TAC) 106.533(f)(1). All emission rates have been lower than the

¹ Off-site receptor - Any recreational area, residence, commercial/industrial facility, or other normally occupied structures not used solely by the owner or operator of the facilities or the owner of the site upon which the facilities are located. Measurements of distances to determine compliance with this distance restriction must be taken toward structures that are in use as of the date that a notification is filed with the commission.

allowable emission rates to the conservatively-selected off-site receptor¹. The calculated emission rate in tpy is compared to the allowable limit of 5 tpy per chemical. All emission rates have been lower than the allowable emission rates.

The air monitoring results from the first few months of operation between September and November 2012 were compiled and submitted in a separate report (December 2012) (along with validated data) to TCEQ to demonstrate compliance with Texas Permit by Rule emission standards. Approval of the analytical results and concurrence that the site will continue to meet Title 30 TAC §106.533 without the use of air abatement using a catalytic oxidation system was obtained from the TCEQ via email on February 22, 2013.

On February 18, 2013, AECOM presented analysis of the approach applicable to obtaining a variance for operating the GWTP without air abatement equipment to the TCEQ and USEPA. The analysis indicated that the use of Explanation of Significant Difference (ESD) is the appropriate approach for the site. Approval of use of ESD was obtained from the USEPA via email on March 21, 2013. The ESD was developed, reviewed, and accepted by USEPA and TCEQ. The ESD was signed by the designated parties on April 3, 2014 and concurrence from the TCEQ was obtained in a letter dated April 16, 2014.

7.2 Air Monitoring Results for the 1st Quarter 2017

A summary of the air sampling results is presented in **Appendix D**. Air samples during the 1st Quarter 2017 were collected on March 28, 2017. All results met the criteria described in **Section 7.1**.

7.2.1 Summa Canister Monitoring Results

One sampling event was conducted during the 1st Quarter 2017 using Summa canisters. The samples were collected and analyzed as described in **Section 7.1** and per the approved air monitoring plan dated August 2012. The analytical results were then compiled in spreadsheets where calculations were completed and comparisons to applicable criteria were made as described in **Section 7.1**.

7.2.1.1 Ambient Air Results

N-hexane, alpha-pinene, dichlorodifluoromethane, trichlorofluoromethane, and trichlorotrifluoroethane were detected in March 2017 in ambient air downwind of the GWTP.

Compounds originating at the GWTP would be expected to have lower concentrations in the downwind sampling location than at the GWTP sampling location. Likewise, compounds like dichlorodifluoromethane, trichlorofluoromethane, trichlorotrifluoroethane, and alpha-pinene with similar concentrations in both GWTP ambient air and downwind ambient air are suspected to be present in the ambient (background) air.

All ambient air results during the quarter met the ambient air criteria.

7.2.1.2 Air Stripper Effluent Results

The VOCs present in groundwater that are removed via the air stripper include 1,1-Dichloroethene, 1,2-dichloroethane, cis-1,2-dichloroethene, MC, TCE, vinyl chloride, and trichlorotrifluoroethane. The highest reported concentrations are for TCE, MC, cis-1,2-

dichloroethene, and trichlorotrifluoroethane. These compounds are frequently reported in groundwater at the site, with the exception of trichlorotrifluoroethane which is not typically a groundwater analyte at LHAAP. Trichlorotrifluoroethane, however, appears to be present in groundwater as indicated by limited analysis conducted in December 2013, where it was detected in several wells, and from historical accounts. Many of the chemicals that are reported in ambient air are not detected in the air stripper effluent. This is likely because the reporting limit for the air stripper effluent is higher than the reporting limit for the ambient air samples or the source for some of these chemicals are extraneous to groundwater.

All air stripper effluent concentrations were below the emission criteria.

7.2.2 PID Results

Along with collection of Summa canister air samples, PID measurements from the same sources/areas are collected and recorded. These simultaneous measurements allowed establishing a correlation between PID readings and VOC concentrations in the Summa canister air samples. Conversion from PID to compound concentrations was established by TCEQ in 30 TAC §106.533(h). The TCEQ equation allows use of a PID to determine individual compound concentrations if the distribution of chemicals in the ambient air is known or assumed. This allows the use of a PID as a tool to measure VOC concentrations and convert the PID results to estimates of compound concentrations. All ambient air PID measurements during this quarter at the GWTP were reported at 0.0 ppmv. The results of the PID readings collected during GWTP operations are presented in **Appendix D**.

8 COMMENTS AND RESPONSES

Comments were received from the TCEQ on the 4th 2016 Quarterly Report via email dated September 5, 2017 and from the EPA via email dated 9/19/17.

TCEQ Comments on the 4th Quarter 2016 Report

1. General Comment: Please revise future GWTP reports (template) to have Table 2-5 Bi-Weekly Analytical GWTP Sampling Results include all of the discharge criteria listed on page 2 of the GWTP Effluent Discharge Protocol. The current GWTP table is missing a few, such as oil & grease, chemical oxygen demand, hexachlorobenzene, and several metals.

Response: Normally, oil & grease, chemical oxygen demand, ROD Table 2 VOCs and Metals are reported quarterly for GWTP Influent and Effluent. Unfortunately, in Q4 2016, the acid spill meant that these particular samples could not be collected and analyzed. Going forward, these parameters will continue to be reported in Table 2-6 Quarterly GWTP Analytical Sampling Results.

EPA Comments on the 4th Quarter 2016 Report

1. Page 8-2: EPA believes this issue was discussed at the last face to face managers meeting. The IWWP is currently incorrect in stating this is a proper method in regards to collecting stream velocity. EPA believes that there was an agreement that the updated IWWP (which will be submitted by the new contractor) will include a technically valid velocity method.

Response: An Installation Wide Work Plan will be developed by the follow-on contractor.

2. Page 8-2: EPA still recommends collecting depth at each section. If this is only performed annually, then there should be a caveat that states after very large flows the bayou cross section will be checked due to potential scour and/fill.

Response: Noted

3. Page 8-2: The document states that the normal discharge rate is at 20 gpm and is based on the recent effluent release memo (they exceed 20 gpm on occasions), but when you combine releases from the pond and the GWTP it can be up to 50 gpm.

Response: Noted. When the flow in Harrison Bayou is high, GWTP effluent and INF Pond effluent can be discharged simultaneously. Under these conditions, the combined total effluent discharge rate is rarely more than 4% of the maximum allowable discharge rate.

4. Table 2-1, Table A-1, Figure B-1: Extraction at ICT 13D is zero, but it appears that there is at least 8 feet of water in it. The 13 series for ICTs has always been somewhat baffling to EPA. In the past, there were bad pumps reported in some of the previous reports, but EPA did not see any mention of a pump problem or why ICT 13D is not producing water in this report? Please clarify.

Response: Concur. ICT-13D has historically been a poor producer. Upon further inspection, we found that the level probes may have been set incorrectly. We have reset the probes and will check to see if ICT-13D extracts more groundwater in the future.

5. Figures B-4, B-5 and B-6: The Legend is incorrect. It provides information on the shallow ground water and not the Wilcox. The Legend needs to be updated to indicate why the DW wells are not used for contouring.

Response: Does not concur. By convention, the water levels in the Shallow Wilcox and Deep Wilcox are depicted together on a figure labeled as just “Wilcox”. At locations where groundwater levels are measured at both the Shallow Wilcox and Deep Wilcox (e.g. 18CPTMW08SW and 18CPTMW08DW), only the Shallow Wilcox value was used to draw contours.

6. Figures C-1 and C-2: Interesting to note that 18CPTMW22R and 18CPTMW22SW (not even sampled) seem to eliminate a hot spot previously identified in this area. This appears to be misleading on what has been found in the past.

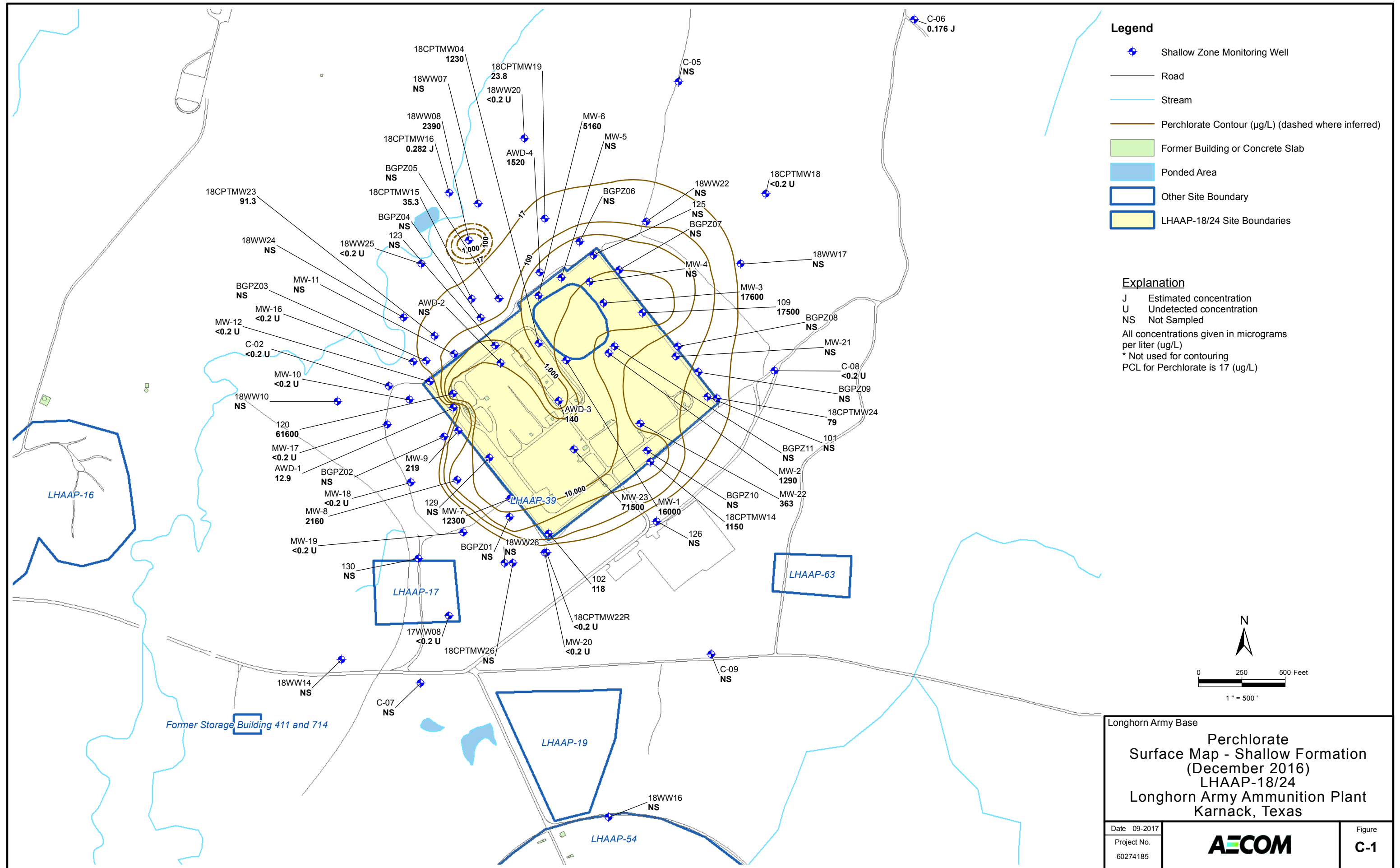
Response: Noted

7. General Comment: For the time-series plots, they indicate zeros which should be less than values for the detection limit. So if the detection limit was 100 ug/L for TCE on a certain day then it would show zero. Also, for MW-02, an exponential expression is being used.

Response: Noted. In order for Excel to graph the time series with a continuous line, non-detect results must be entered as zero. Although the value appears as zero in the trend plot, the actual result (i.e. <100 µg/L) is reported in Table 4-2.

8. General Comment: AWD-1 seems to be missing from the contour and the COC isopleth maps. Since this well has MC and TCE above the MCLs, this data should be used to develop the isopleths.

Response: Concur. Data for AWD-1, AWD-3, AWD-4, C-06, and C-08 were mislabeled as “NS” when in fact they had been sampled and included in shaping the isoconcentration contours. Figures C-1 and C-3 have been corrected to show the proper concentrations are posted. Figure C-5 has been recontoured to include data from AWD-1 for methylene chloride.



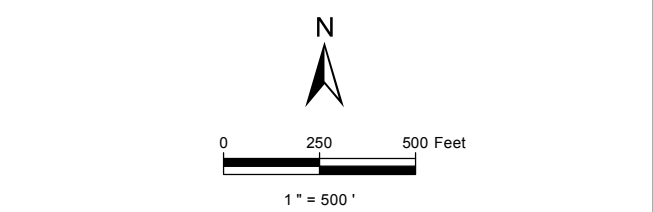
Legend

- ◆ Shallow Zone Monitoring Well
- Road
- Stream
- - - Perchlorate Contour (ug/L) (dashed where inferred)
- Former Building or Concrete Slab
- Ponded Area
- Other Site Boundary
- LHAAP-18/24 Site Boundaries

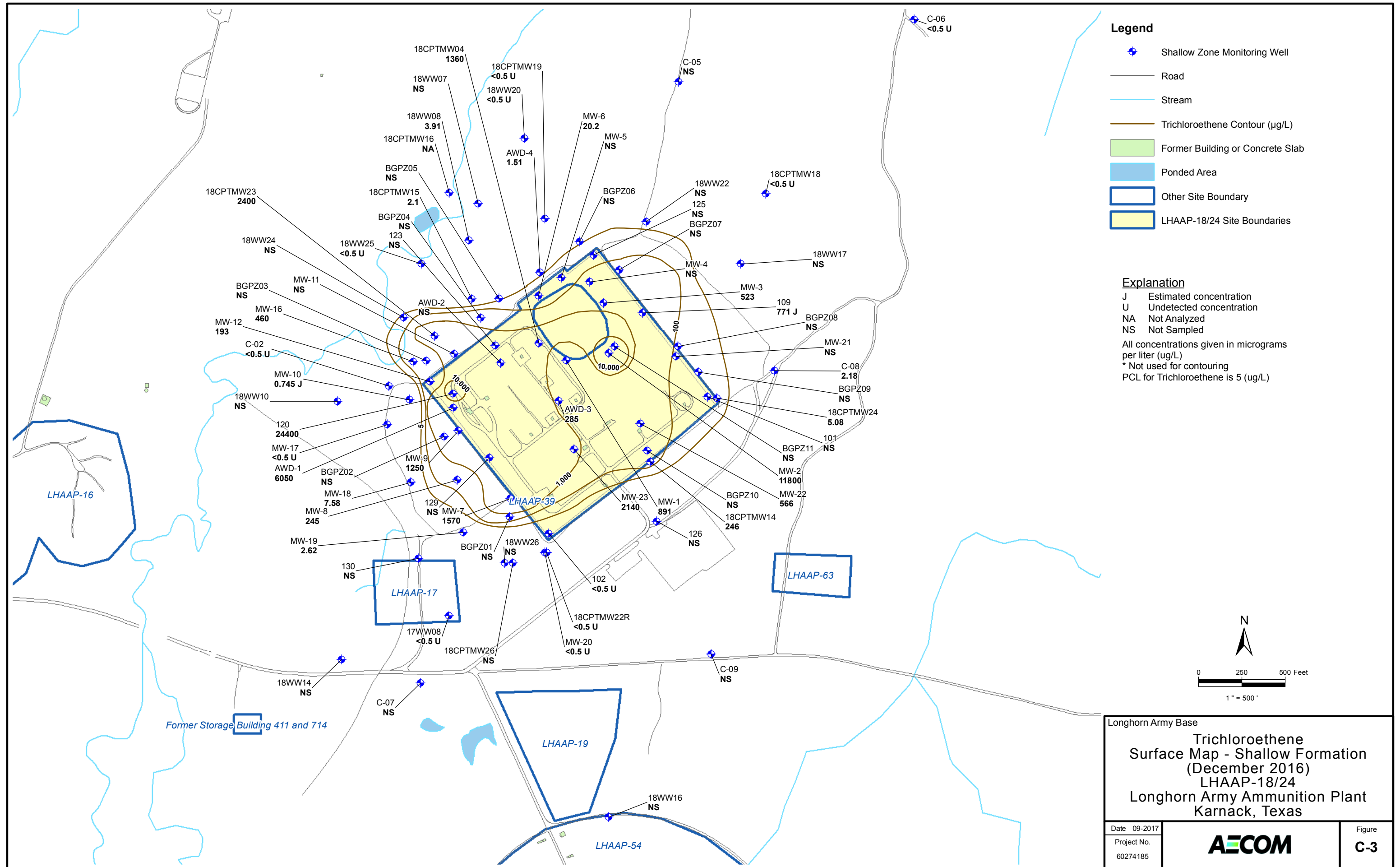
Explanation

J Estimated concentration
 U Undetected concentration
 NS Not Sampled

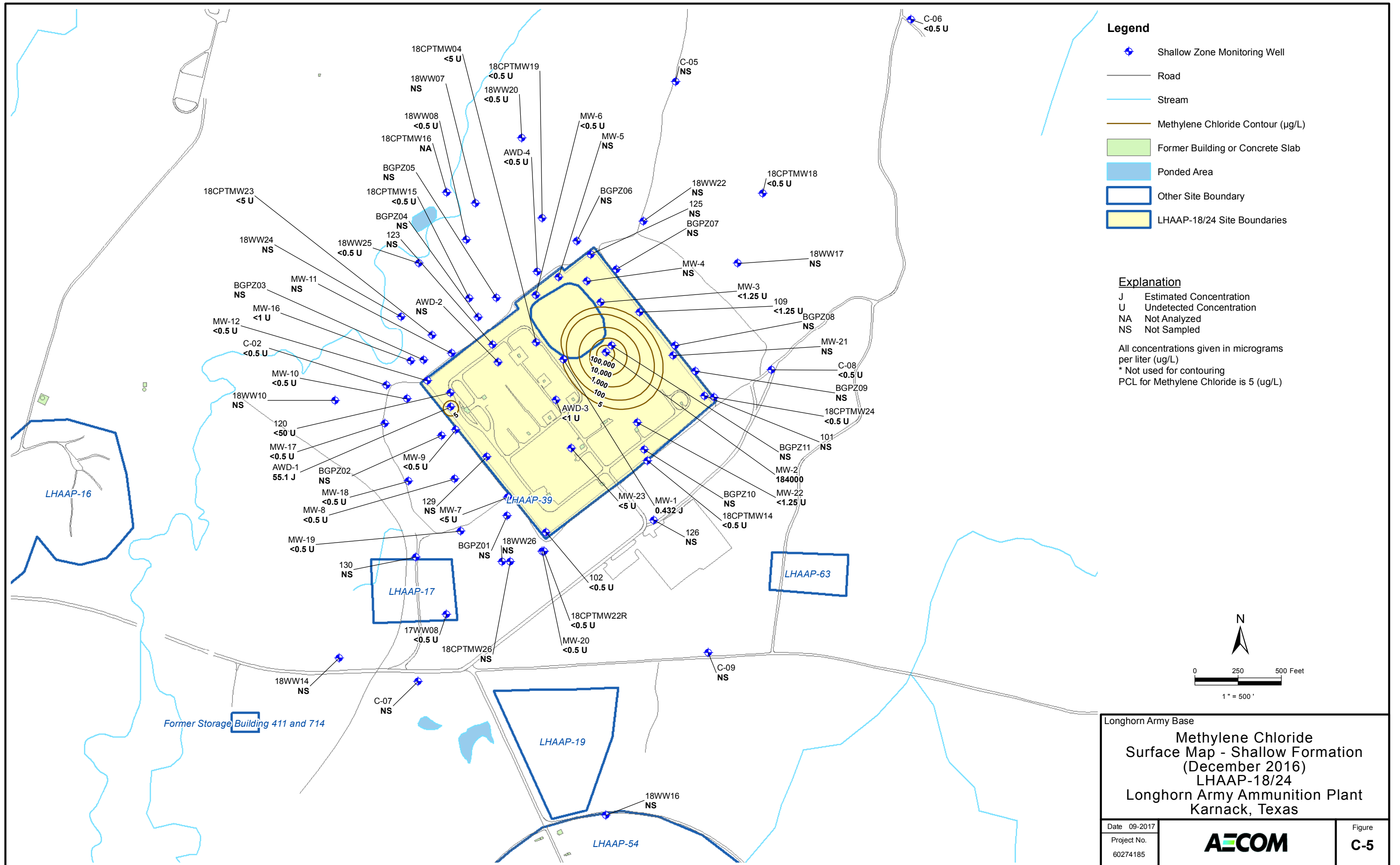
All concentrations given in micrograms per liter (ug/L)
 * Not used for contouring
 PCL for Perchlorate is 17 (ug/L)



Longhorn Army Base Perchlorate Surface Map - Shallow Formation (December 2016) LHAAP-18/24 Longhorn Army Ammunition Plant Karnack, Texas		
Date	09-2017	
Project No.	60274185	
Figure C-1		



Longhorn Army Base	
Trichloroethene Surface Map - Shallow Formation (December 2016) LHAAP-18/24 Longhorn Army Ammunition Plant Karnack, Texas	
Date: 09-2017	
Project No. 60274185	
Figure C-3	



APPENDIX A: ICT Layout and GWTP Process Flow Diagram

Table A-1: ICTs Completion Depths

ICT	TOC Elevation	Total Depth	Sump Elevation	Comment
1	186.07	22.5	163.57	Taken out of service in 2007
2	185.02	29.5	155.52	
3	192.27	37.75	154.52	Taken out of service in 2007
4	193.51	37.5	156.01	
5	192.67	35	157.67	Taken out of service in 2007
6	197.30	40.75	156.55	Converted to infiltration in 2007. Ceased reinjection in July 2012.
7	198.03	32.33	165.7	
8	198.97	44.5	154.47	
9	197.64	45.5	152.14	Converted to infiltration in 2007. Ceased reinjection in July 2012.
10	198.07	45.42	152.65	Taken out of service in 2007
11	198.01	43.33	154.68	
12A	189.06	31.5	157.56	Taken out of service in 2007. Reinstated in December 2012.
12B	191.97	36.25	155.72	
12C	193.90	34.33	159.57	
12D	185.64	33.75	151.89	
12E	183.38	32.25	151.13	
13A	182.59	28.17	154.42	
13B	184.72	29.58	155.14	
13C	186.13	28.17	157.96	
13D	186.72	26.17	160.55	
13E	191.79	27.08	164.71	
13F	197.81	32.33	165.48	
13G	197.03	27.25	169.78	Taken out of service in 2008.
14A	196.8	43.00	153.8	
14B	197.61	43.42	154.19	
14C	197.86	41.33	156.53	
14D	198.47	44.25	154.22	
14E	198.47	43.08	155.39	

Note(s):

Sump elevation calculated by subtracting total depth from TOC elevation.

ICTs were installed in 1998.

Elevations are reported as feet above mean sea level.

Total depths are reported as feet below TOC.

ICT 12A was replaced on December 5, 2012 and extraction has resumed.

TOC Elevations and total depth measured in October 2003, 4th Quarter 2003, GWTP Report.

ICT - interception-collection trench

TOC - top of casing, measuring point for groundwater elevations



LHAAP-17
Burning Ground #2

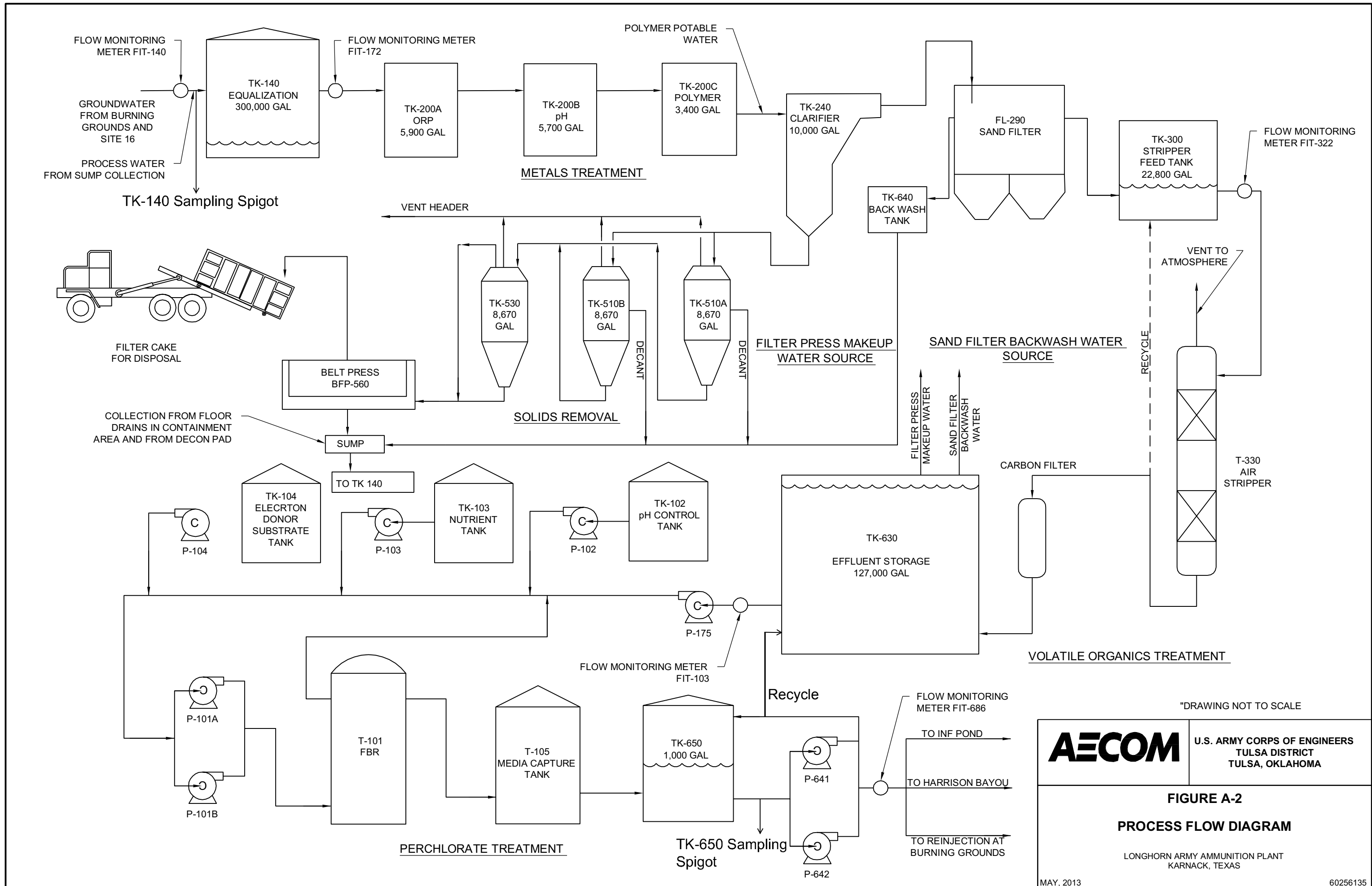
LEGEND

- Extraction Location
- ▲ Deactivated ICT Sump
- Injection Point – inactive since May 24, 2012
- ICT Location
- HDPE Liner Installed on the Outside of the ICT
- Stream
- Road
- Building or Pad
- Site



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE A-1
SITE VICINITY MAP
LHAAP-18/24



"DRAWING NOT TO SCALE"

AECOM	U.S. ARMY CORPS OF ENGINEERS TULSA DISTRICT TULSA, OKLAHOMA
FIGURE A-2	
PROCESS FLOW DIAGRAM	
LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS	

MAY, 2013 60256135

APPENDIX B: Groundwater Elevation Contour Maps

Table B-1: Extraction Equipment Maintenance Since 2011

LHAAP-18/24

Well I.D.	Replaced Parts	Date	Contractor
ICT 14E	pump	3/15/2012	Shaw
ICT 14D	pump, motor, level probes	3/16/2012	Shaw
ICT 14B	pump, level probes, level probe wire	3/16/2012	Shaw
ICT 14A	pump, motor, level probes, level probe wire	3/17/2012	Shaw
ICT 2	pump, motor	3/17/2012	Shaw
ICT 13D	pump	3/19/2012	Shaw
ICT 13B	pump	3/20/2012	Shaw
ICT 14E	pump, motor, broken piping	11/19/2012	AECOM
ICT 13C	pump	11/20/2012	AECOM
ICT13E	Pump	11/20/2012	AECOM
ICT 12A	pump, motor, wiring harness, level probes, level probe wire	12/5/2012	AECOM
ICT 7	pump, motor, wiring harness, level probes	12/6/2012	AECOM
ICT2	pump	6/10/2013	AECOM
ICT 13C	pump	6/11/2013	AECOM
ICT 13D	pump	6/12/2013	AECOM
ICT 14E	pump rebuilt	6/15/2013	AECOM
ICT 14E	Replaced low level switch	6/19/2013	AECOM
ICT 13C	pump, wiring harness, flow meter	4/15/2014	AECOM
ICT 14D	Repaired level probes	6/24/2014	AECOM
ICT 14E	Repaired level probes	6/24/2014	AECOM
ICT 14E	pump and motor troubleshooting	6/26/2014	AECOM
ICT2, 13F, 14C, 14D, 14E	Repaired level probes	7/7/2014	AECOM
ICT 12E	pump, motor	10/2/2014	AECOM
ICT 12E	wiring harness, fixed leak	10/8/2014	AECOM
ICT 12E	level probes	10/9/2014	AECOM
ICT13A	pump, piping	10/15/2014	AECOM
ICT 12E	Repaired leaking fittings	10/16/2014	AECOM
ICT 11	1" tee and 1" elbow	1/13/2015	AECOM
ICT 12B	Flow meter	1/13/2015	AECOM
ICT 7	1" tee, repaired 1" pipe	1/13/2015	AECOM
ICT 13A	Flow meter	1/15/2015	AECOM
ICT 13B	Pump	1/15/2015	AECOM
ICT 13C	Pump	1/16/2015	AECOM
ICT 7	Low level probe	1/16/2015	AECOM
ICT 13D	Pump, level probes	1/17/2015	AECOM
ICT 14C	Low level probe	1/17/2015	AECOM
ICT 14C	Low level probe	1/29/2015	AECOM
ICT 14D	Low level probe	1/29/2015	AECOM
ICT 13D	Level probes	1/29/2015	AECOM
ICT 2	Pump	1/30/2015	AECOM
ICT 8	Fuse	3/2/2015	AECOM
ICT 8	Fuse	3/9/2015	AECOM
ICT 12E	Flow meter	3/13/2015	AECOM
ICT 13D	Union	3/13/2015	AECOM

Table B-1: Extraction Equipment Maintenance Since 2011

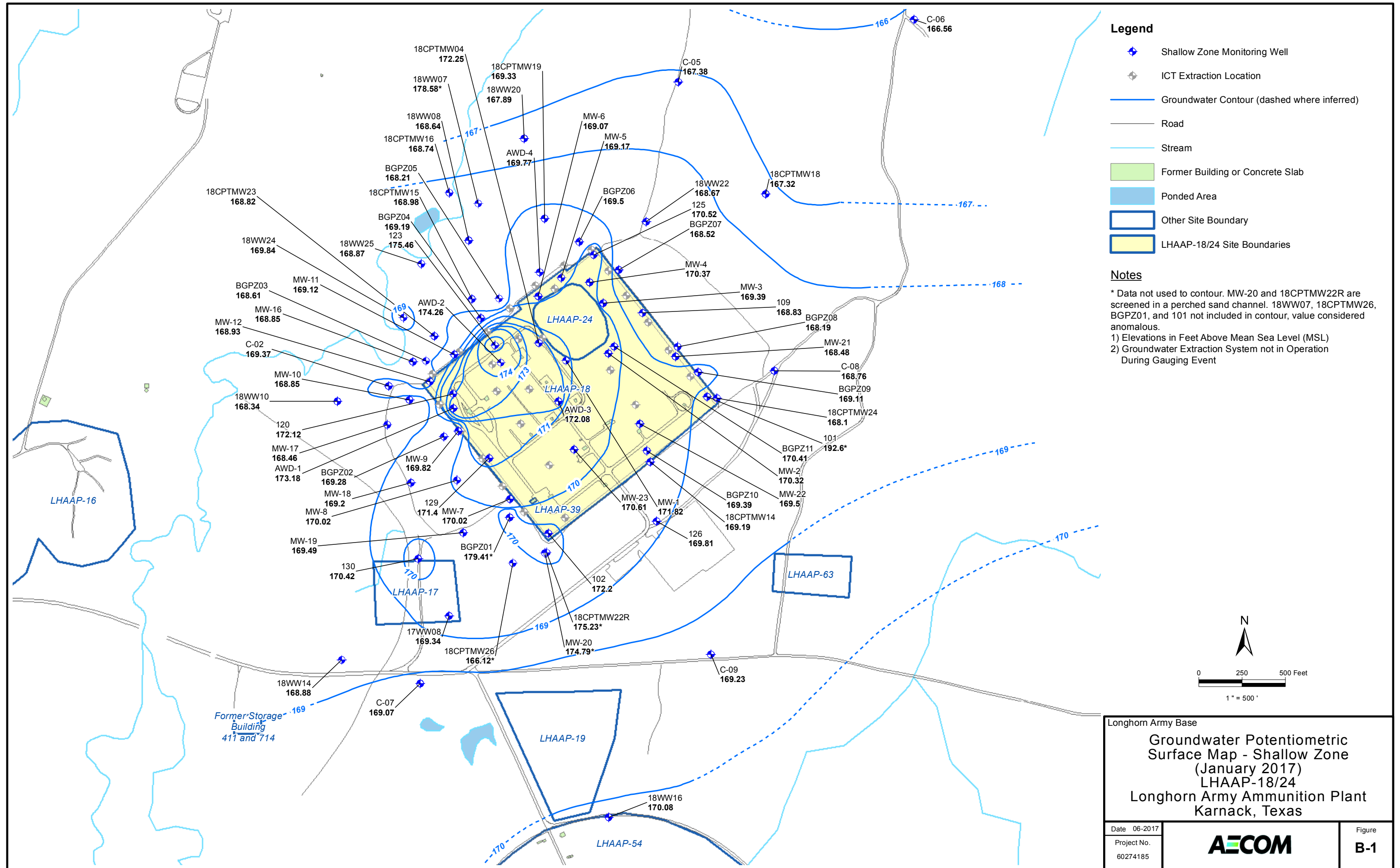
Well I.D.	Replaced Parts	Date	Contractor
ICT 14C	Cleaned level probes	4/1/2015	AECOM
ICT 14D	Cleaned level probes	4/1/2015	AECOM
ICT 13A	Cleaned level probes	4/21/2015	AECOM
ICT 14C	Cleaned level probes	4/21/2015	AECOM
ICT 8	Low level probe	7/24/2015	AECOM
ICT 13C	Installed New Pump	7/28/2015	AECOM
ICT 14C	Installed New Pump and Electric Motor	7/29/2015	AECOM
ICT 14E	Installed New Pump and Electric Motor	7/31/2015	AECOM
ICT 12E	Repaired wiring	8/12/2015	AECOM
ICT 13E	Replaced high and low level probes	8/12/2015	AECOM
ICT 2	Installed Rebuilt Pump	9/9/2015	AECOM
ICT 12 E, ICT 14E	Replaced high level probe and wiring	9/15/2015	AECOM
ICT 13A	Installed new pump	12/23/2015	AECOM
ICT 13B	Installed new pump	12/24/2015	AECOM
ICT 13D	Replaced high level probe	2/11/2016	Aerotek
ICT 14C	Replace low level probe on ICT 14C	2/15/2016	Aerotek
ICT 8	Installed new pump and electric motor	2/19/2016	Aerotek
ICT 14C	Repaired piping leak	3/10/2016	Aerotek
ICT 14E	Installed high and low level probes, level probe wire	3/22/2016	Aerotek
ICT 13D, ICT 14B	Installed high and low level probes, level probe wire	3/24/2016	Aerotek
ICT 14B	Installed new pump and electric motor	3/31/2016	Aerotek
ICT 14C	Installed new low level probe	4/20/2016	Aerotek
ICT 12B	Installed new mechanical flow meter	6/16/2016	Aerotek
ICT 13C	Installed rebuilt pump and new flow meter	8/10/2016	Aerotek
ICT 13A	Installed rebuilt pump, new flow meter, and new 1" unions	8/24/2016	Aerotek
ICT 14E	Installed new mechanical flow meter	8/26/2016	Aerotek
ICT 12C	Repair flow meter	8/30/2016	Aerotek
ICT 2	Install rebuilt pump and new flow meter	8/31/2016	Aerotek
ICT 14C	Clean and adjust level probes	9/7/2016	Aerotek
ICT 14C	Replaced level probes	9/12/2016	Aerotek
ICT 14C	Installed new level probe wire and level probes	9/21/2016	Aerotek
ICT 12C	Installed rebuilt pump, new electric motor, new wiring harness, new level probe wire, and new level probes	9/27/2016	Aerotek

Table B-1: Extraction Equipment Maintenance Since 2011

Well I.D.	Replaced Parts	Date	Contractor
ICT 14C	Cleaned and adjusted level probes	10/14/2016	Aerotek
ICT 13C	Cleaned and adjusted level probes	10/21/2016	Aerotek
ICT 13B	Installed rebuilt pump	10/25/2016	Aerotek
ICT 14D	Installed rebuilt pump	10/27/2016	Aerotek
ICT 13C	Replace low level probe	11/8/2016	Aerotek
ICT 13B	Replace relay base plate	11/8/2016	Aerotek
ICT 13E	Clean and adjust low level probe	11/15/2016	Aerotek
ICT 13B	Replace broken relay base plate and bad level probe wire	11/17/2016	Aerotek
ICT 13C	Clean & repair leaking flow meter	11/18/2016	Aerotek
ICT 13B	Clean & adjust low level probe	11/18/2016	Aerotek
ICT 13A, 13B, & 13E	Clean and adjust low level probes	12/2/2016	Aerotek
ICT 13C & 14C	Pulled piping and pumps	2/8/2017	Aerotek
ICT 14C	Installed new electric motor	2/8/2017	Aerotek
ICT 13C & 14C	Installed rebuilt grundfos pumps	2/8/2017	Aerotek
ICT 7, 13A, & 14D	Repaired sample ports	2/9/2017	Aerotek
ICT 13B & 14E	Cleaned and adjusted low level probes	3/30/2017	Aerotek
ICT 13B & 13F	Installed new flow meters	3/30/2017	Aerotek

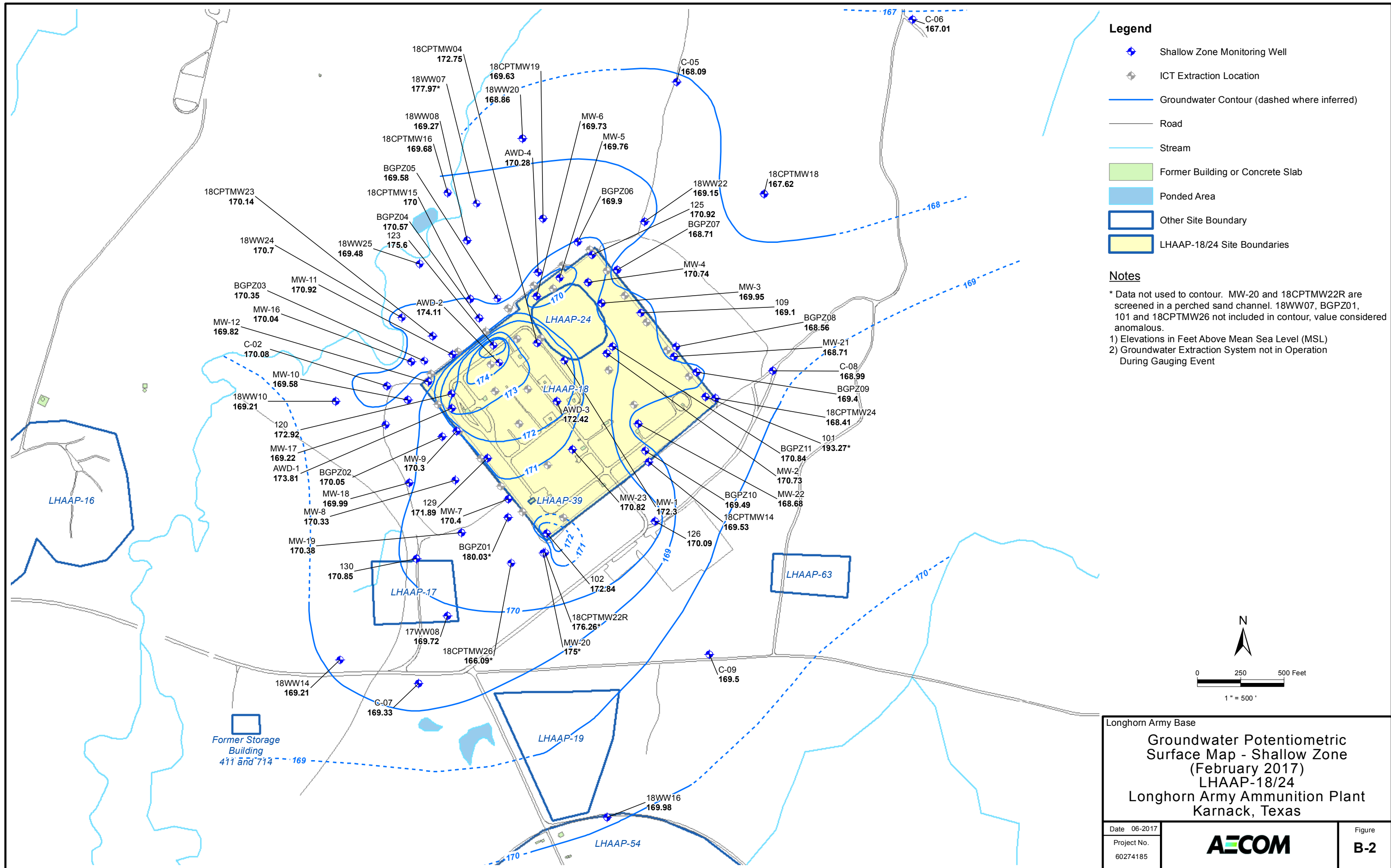
LHAAP-16

Well I.D.	Replaced Parts	Date	Contractor
EW08	New pump	2/28/2011	Shaw
EW01	Rebuild pump	8/25/2011	Shaw
EW06	Rebuild pump	8/25/2011	Shaw
EW02	Rebuild pump	2/12/2012	Shaw
EW03	Rebuild pump	2/12/2012	Shaw
EW08	Rebuild pump	11/8/2012	AECOM
EW01	Rebuild pump	11/8/2012	AECOM
EW04	Repair pump	11/13/2012	AECOM
EW07	Rebuild pump	11/13/2012	AECOM
EW04	Installed New Pump	11/28/2012	AECOM
EW06	Installed New Pump	11/28/2012	AECOM
EW02	Installed New Pump	12/4/2012	AECOM
EW03	Installed New Pump	12/4/2012	AECOM
EW01	Installed New Pump	12/17/2012	AECOM
EW01	Replaced Low level probe	1/17/2015	AECOM
EW01	Cleaned and adjusted level probes	10/21/2016	Aerotek



Longhorn Army Base
Groundwater Potentiometric Surface Map - Shallow Zone (January 2017)
 LHAAP-18/24
 Longhorn Army Ammunition Plant
 Karnack, Texas

Date	06-2017		Figure
Project No.	60274185		B-1



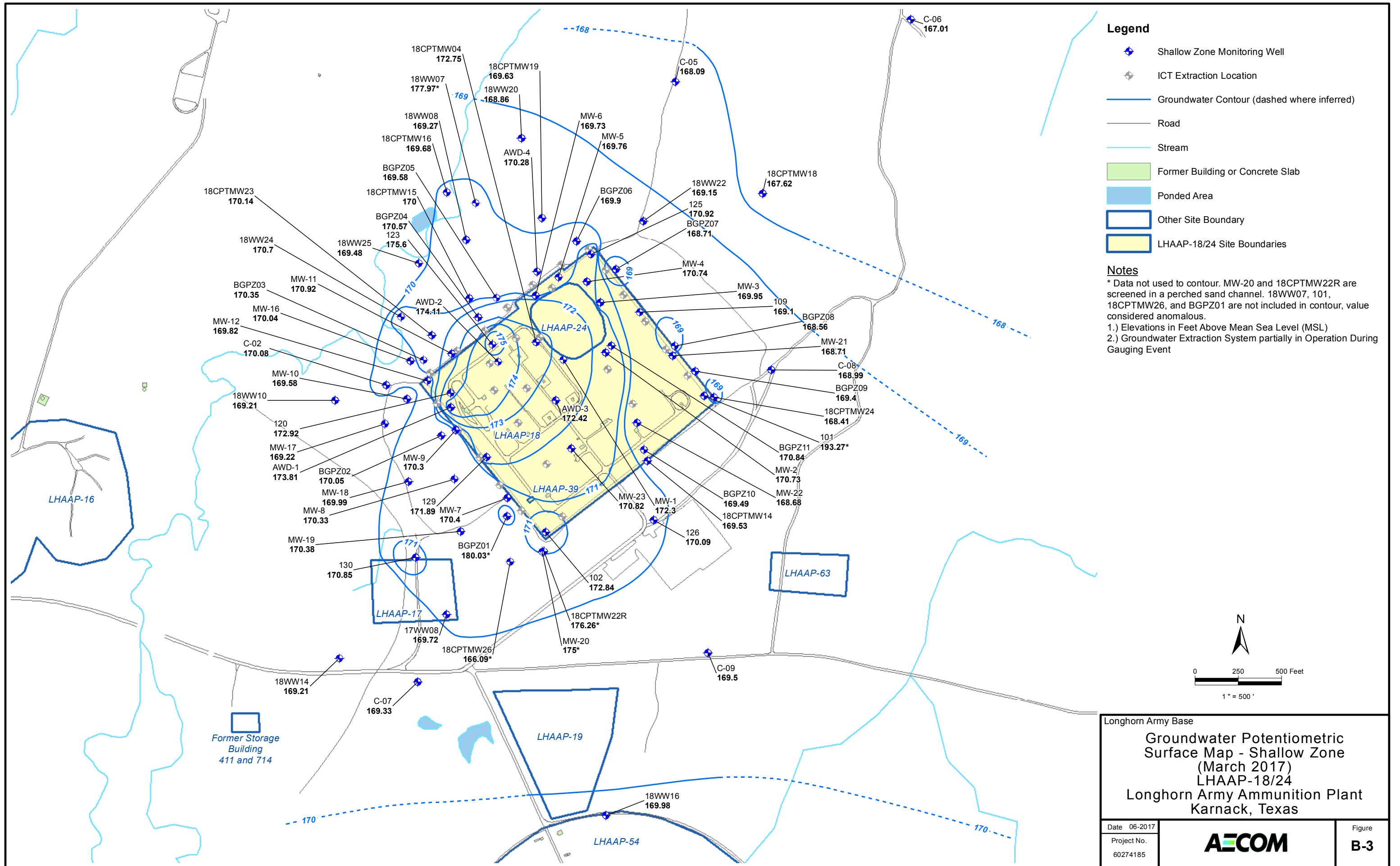
Longhorn Army Base

Groundwater Potentiometric Surface Map - Shallow Zone (February 2017)

LHAAP-18/24

Longhorn Army Ammunition Plant
Karnack, Texas

Date	06-2017		Figure
Project No.	60274185		B-2



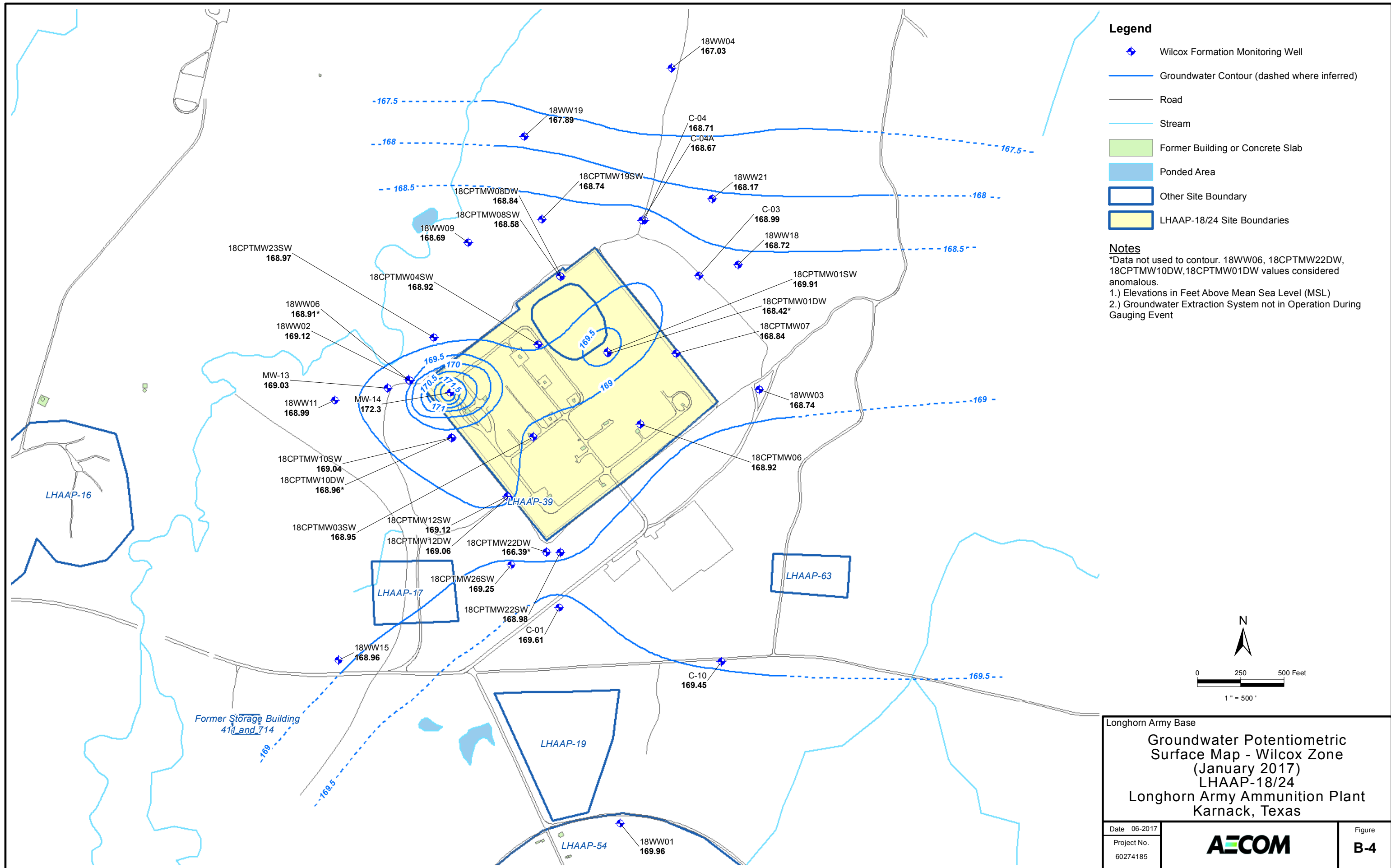
Longhorn Army Base

Groundwater Potentiometric Surface Map - Shallow Zone (March 2017)

LHAAP-18/24

Longhorn Army Ammunition Plant
Karnack, Texas

Date 06-2017	AECOM	Figure
Project No. 60274185		B-3



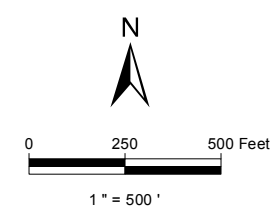
Legend

- ◆ Wilcox Formation Monitoring Well
- Groundwater Contour (dashed where inferred)
- Road
- Stream
- Former Building or Concrete Slab
- Ponded Area
- Other Site Boundary
- LHAAP-18/24 Site Boundaries

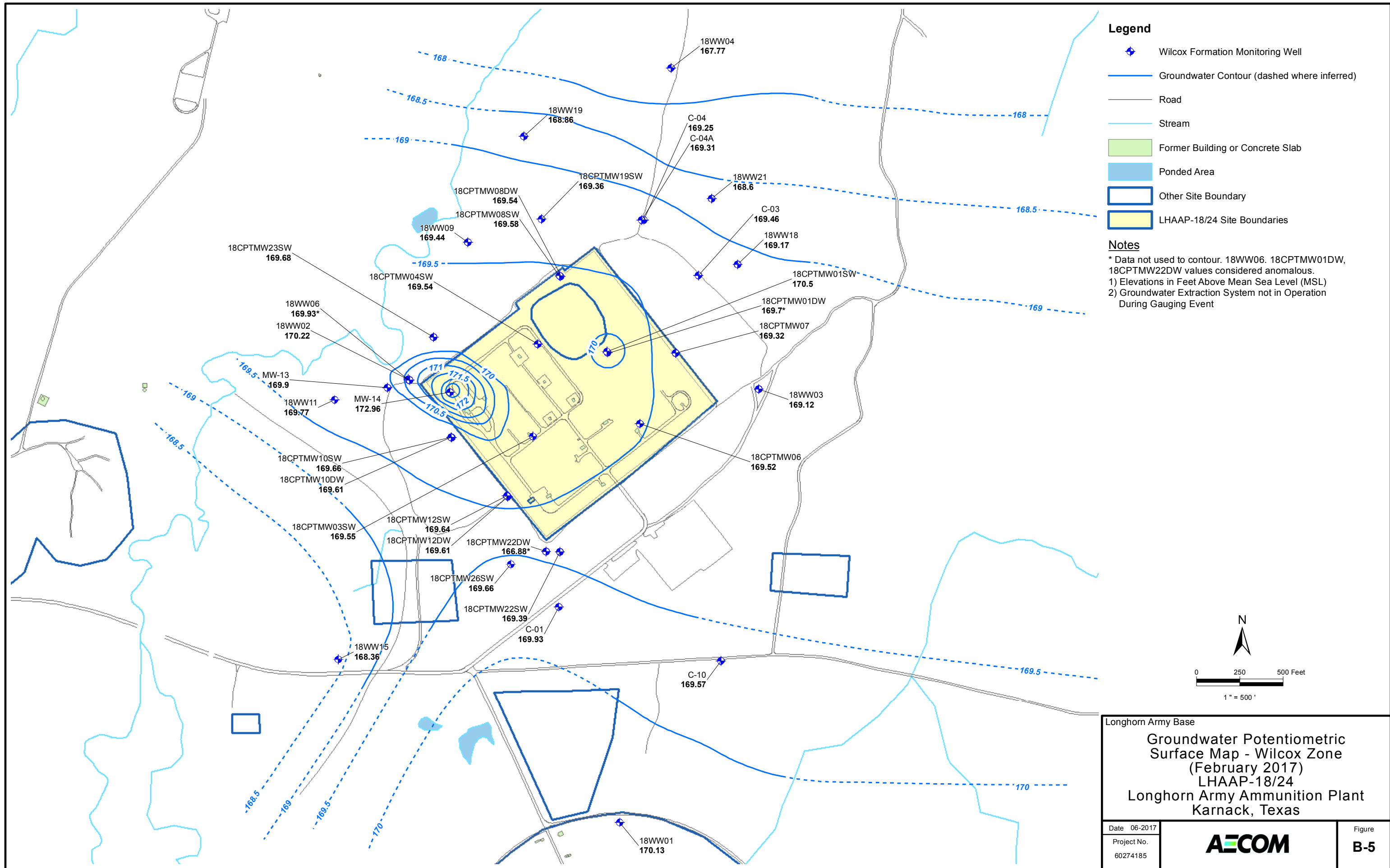
Notes

*Data not used to contour. 18WW06, 18CPTMW22DW, 18CPTMW10DW, 18CPTMW01DW values considered anomalous.

- 1.) Elevations in Feet Above Mean Sea Level (MSL)
- 2.) Groundwater Extraction System not in Operation During Gauging Event



Longhorn Army Base Groundwater Potentiometric Surface Map - Wilcox Zone (January 2017) LHAAP-18/24 Longhorn Army Ammunition Plant Karnack, Texas		
Date 06-2017	AECOM	Figure
Project No. 60274185		B-4



Legend

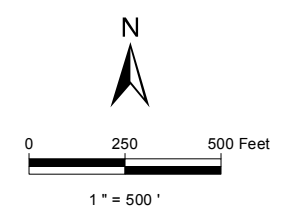
- ◆ Wilcox Formation Monitoring Well
- Groundwater Contour (dashed where inferred)
- Road
- Stream
- Former Building or Concrete Slab
- Ponded Area
- Other Site Boundary
- LHAAP-18/24 Site Boundaries

Notes

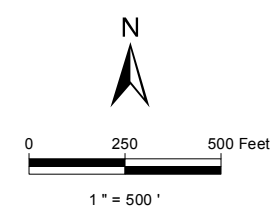
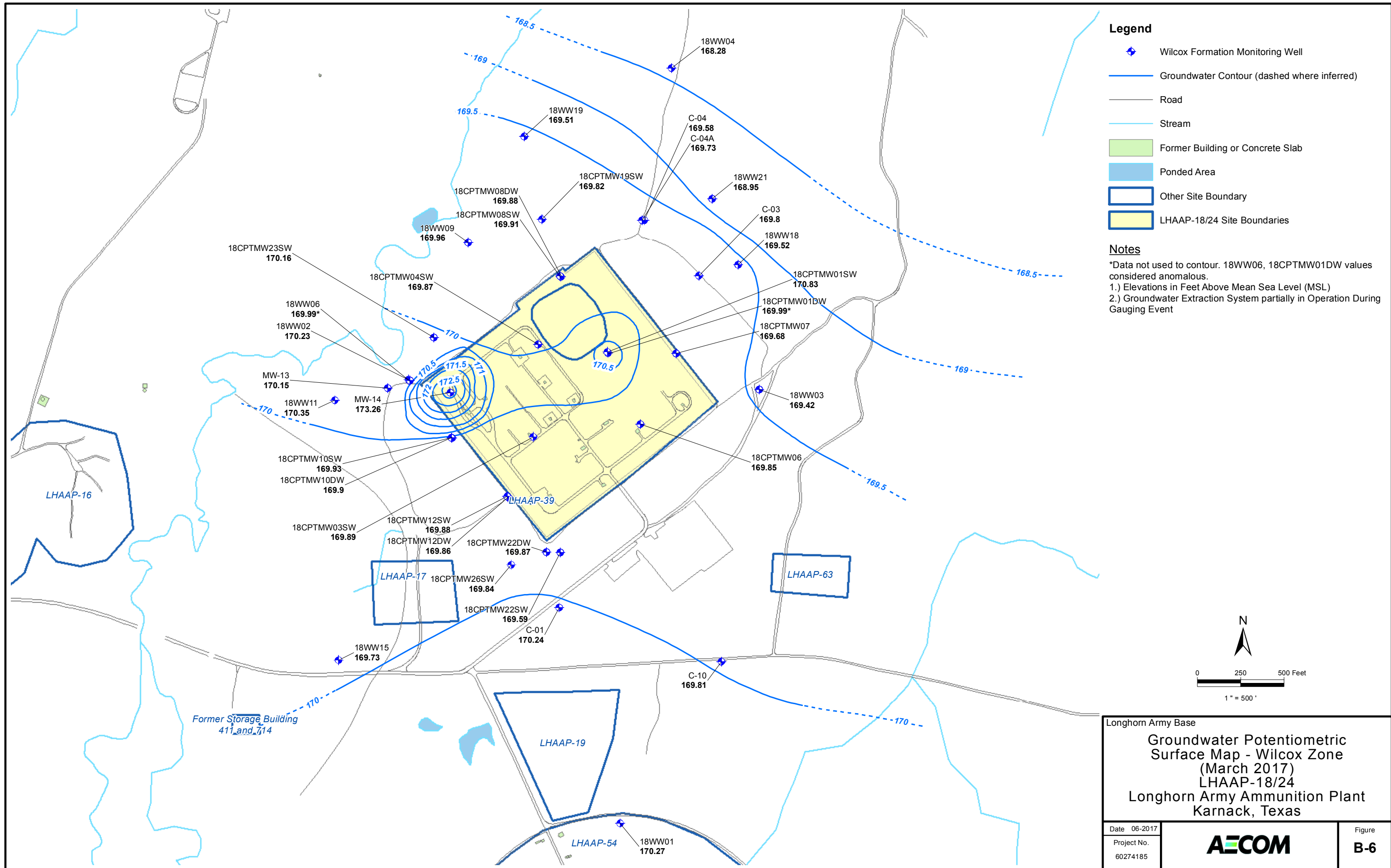
* Data not used to contour. 18WW06, 18CPTMW01DW, 18CPTMW22DW values considered anomalous.

1) Elevations in Feet Above Mean Sea Level (MSL)

2) Groundwater Extraction System not in Operation During Gauging Event



Longhorn Army Base		<p>Groundwater Potentiometric Surface Map - Wilcox Zone (February 2017)</p> <p>LHAAP-18/24</p> <p>Longhorn Army Ammunition Plant Karnack, Texas</p>
Date	06-2017	
Project No.	60274185	
AECOM		Figure B-5



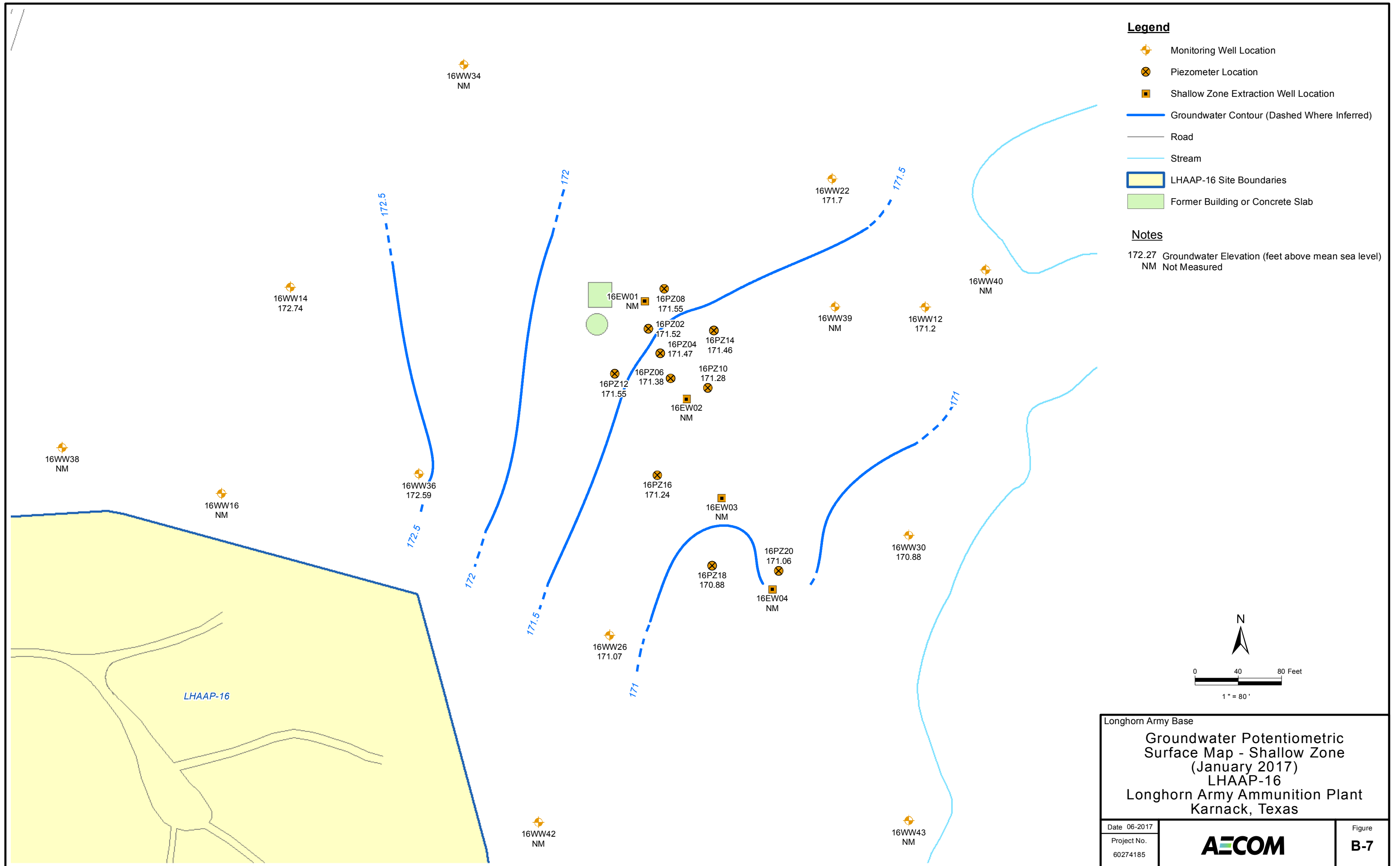
Longhorn Army Base

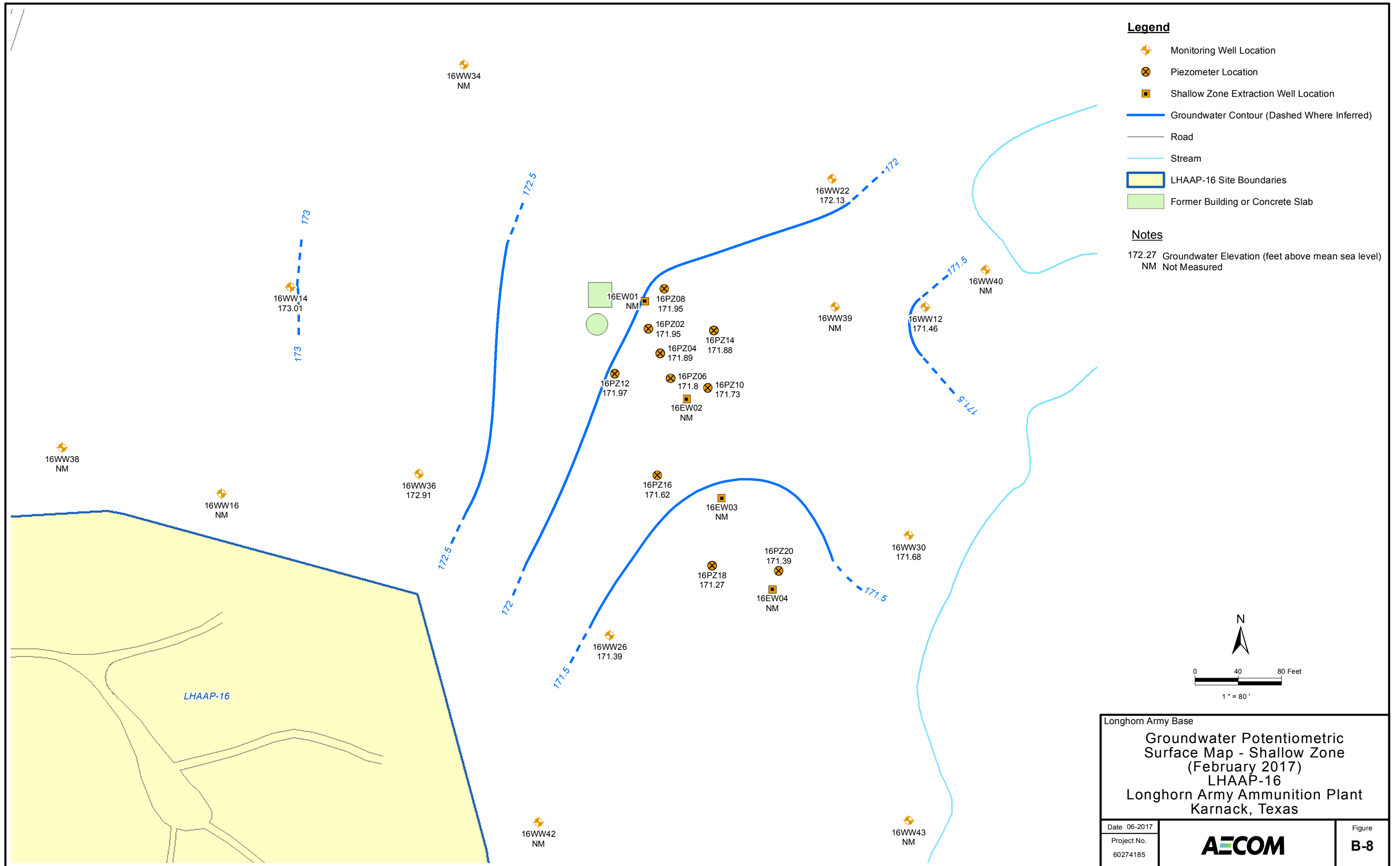
Groundwater Potentiometric Surface Map - Wilcox Zone (March 2017)

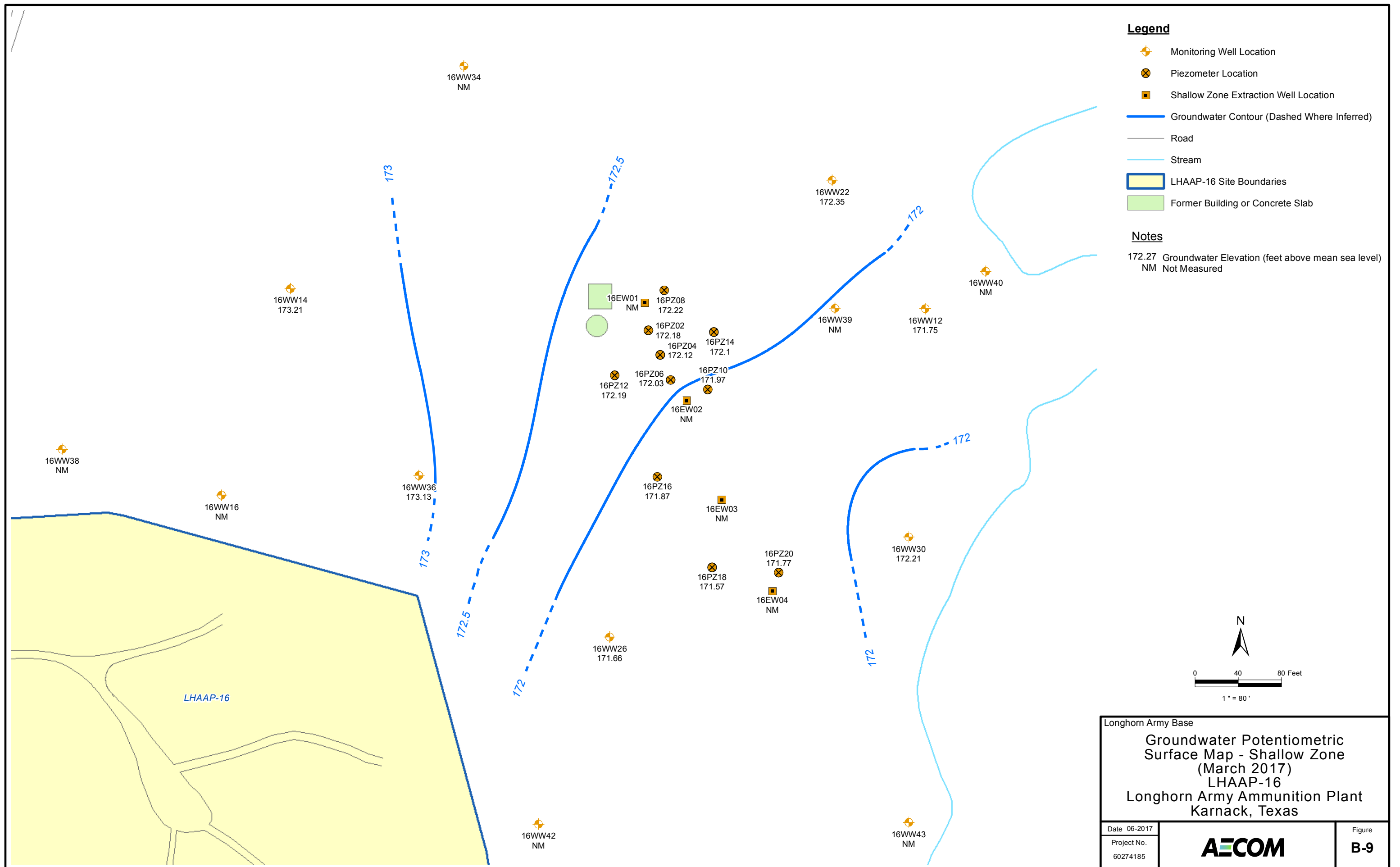
LHAAP-18/24

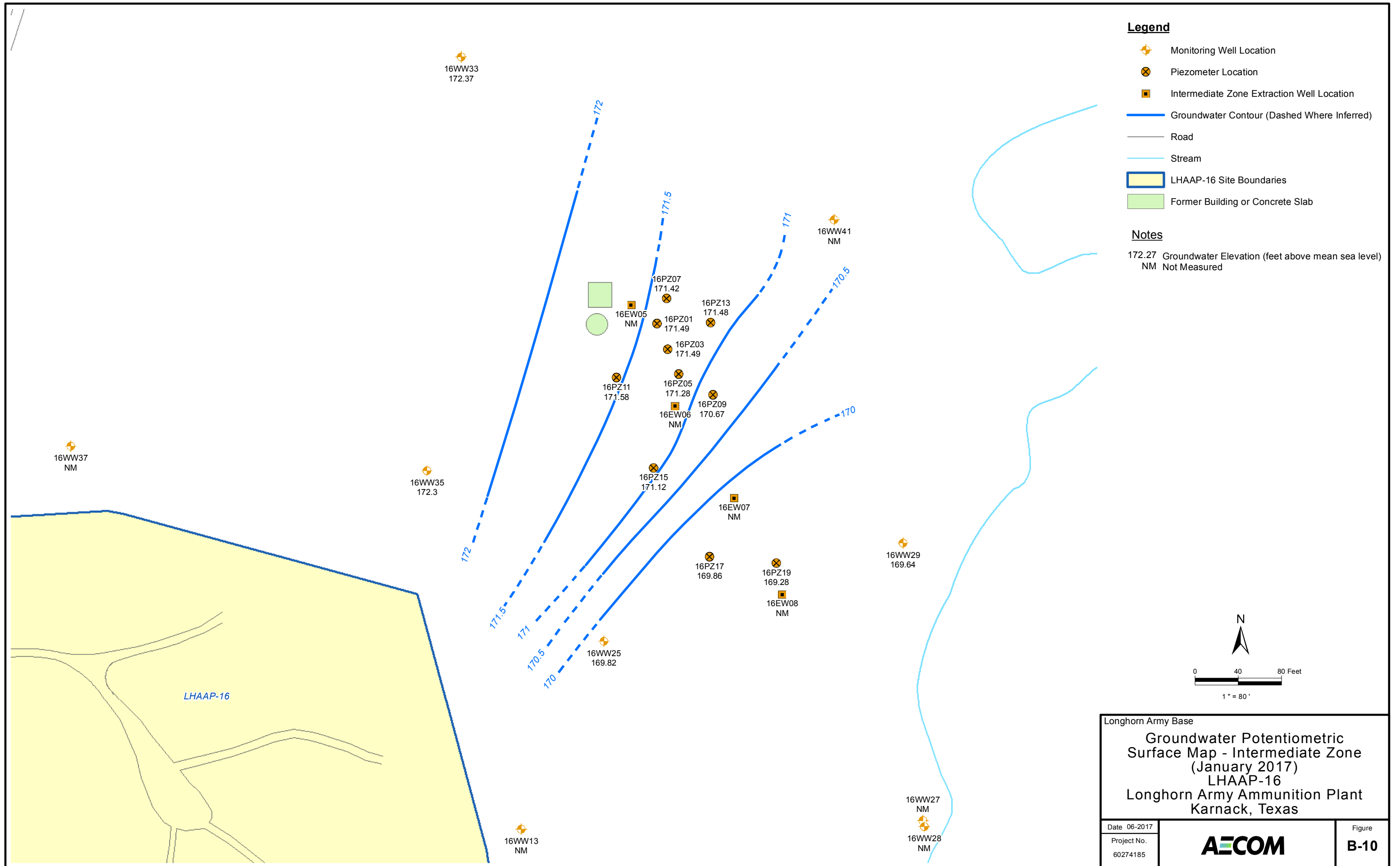
Longhorn Army Ammunition Plant Karnack, Texas

Date 06-2017	AECOM	Figure
Project No. 60274185		B-6









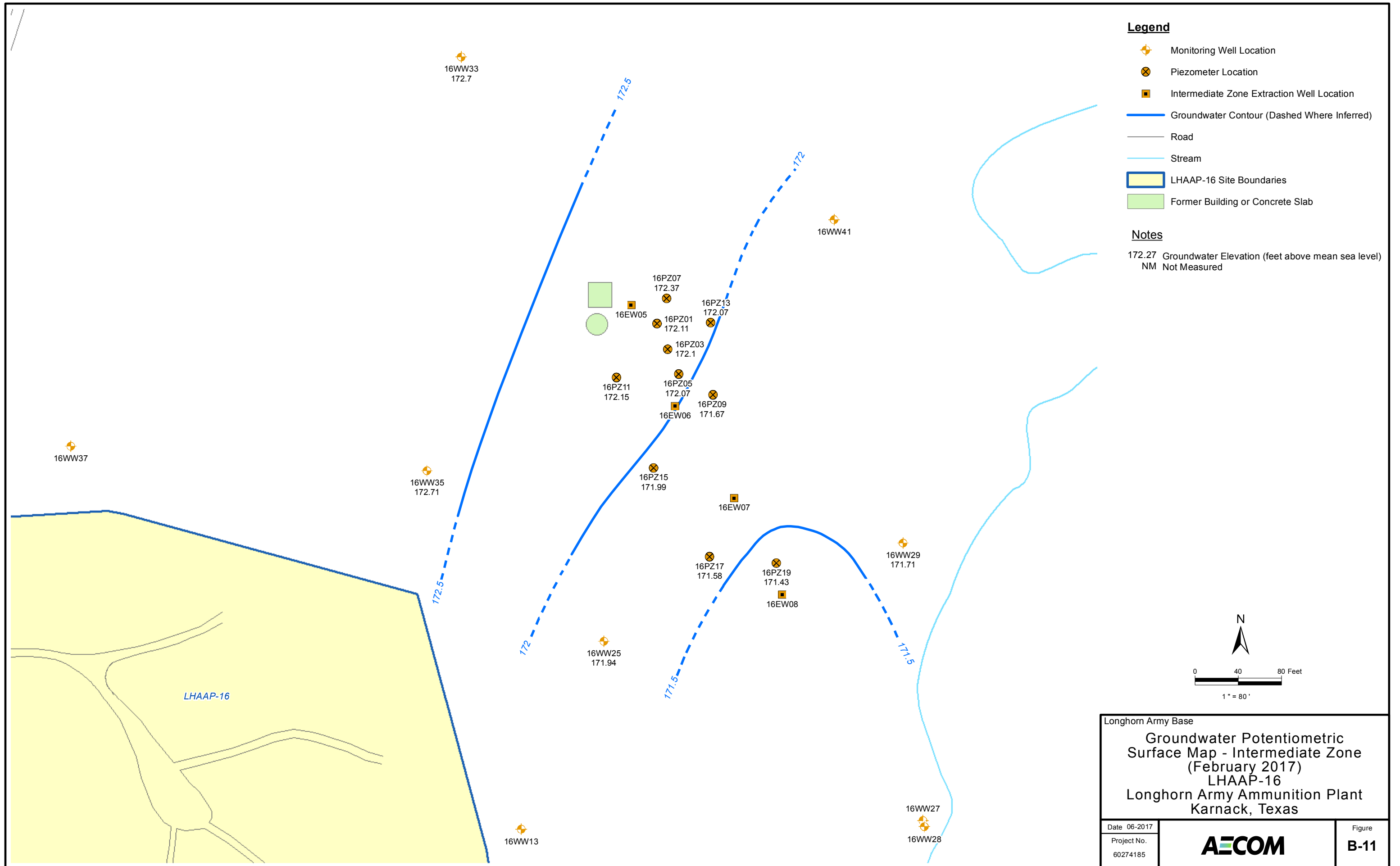
Longhorn Army Base

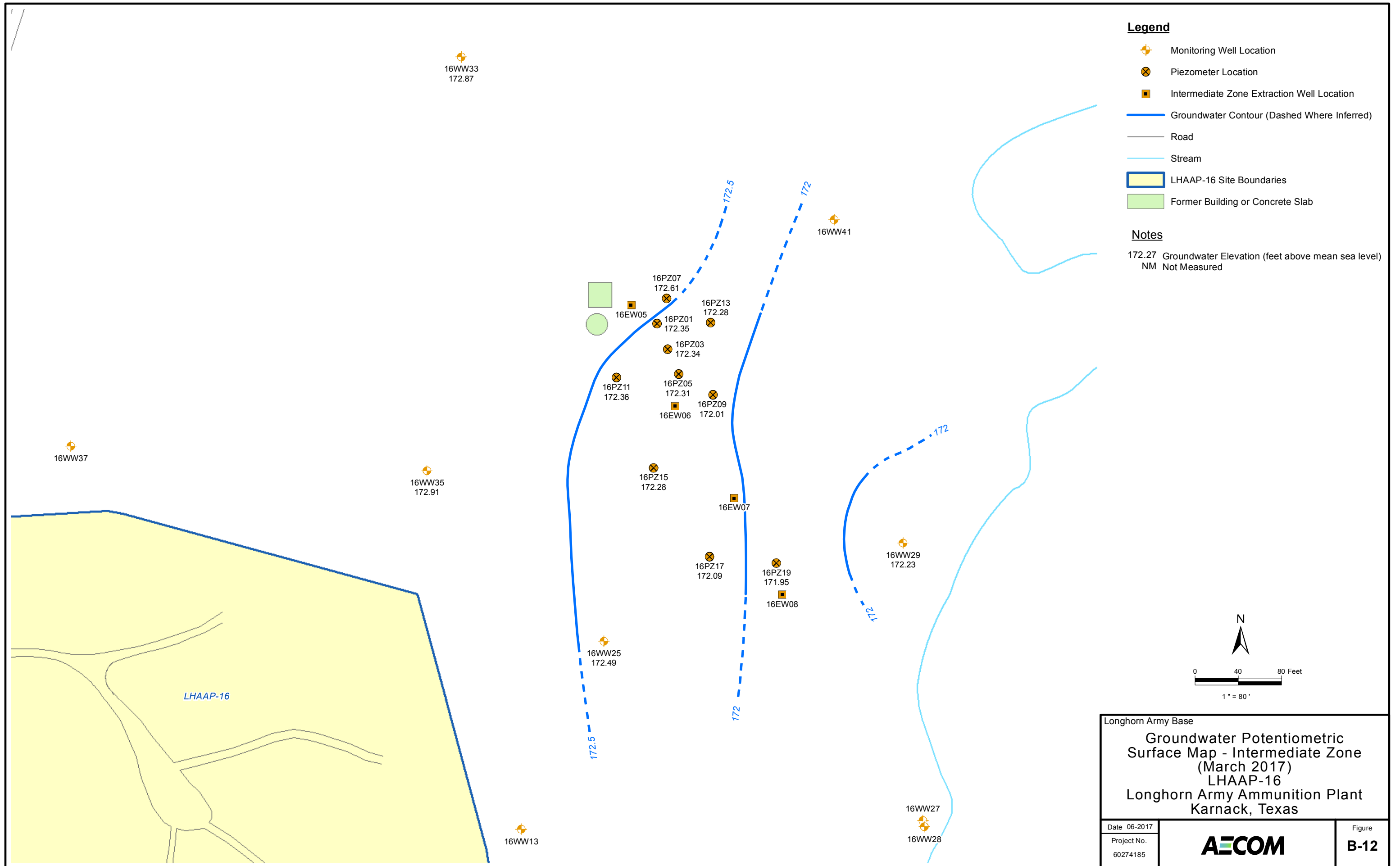
Groundwater Potentiometric Surface Map - Intermediate Zone (January 2017)

LHAAP-16

Longhorn Army Ammunition Plant Karnack, Texas

Date 06-2017	AECOM	Figure
Project No. 60274185		B-10





**APPENDIX C: Water and Air Data Validation and Sampling Results for the
1st Quarter 2017**

QUALITY CONTROL SUMMARY REPORT
1st QUARTER (January-March) 2017
FOR
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared For:



U.S. Army Corps of Engineers

Prepared By:

AECOM

AECOM Technical Services

August 2017

Table of Contents

1	INTRODUCTION	1
1.1	Intended Use of Data.....	1
1.2	Preservation and Holding Times	1
1.3	Calibrations.....	2
1.3.1	Continuing Calibration Verifications.....	2
1.3.1.1	SW8260.....	2
1.3.2	Low Level Calibration Verification.....	2
1.3.3	Blanks	2
1.3.4	Surrogates	2
1.3.5	Laboratory Control Sample	3
1.3.5.1	SW8270.....	3
1.3.5.2	TO-15.....	3
1.3.6	Matrix Spike/Matrix Spike Duplicate	3
1.3.6.1	SW6010C	3
1.3.6.2	SW6020A	3
1.3.7	Internal Standards	3
1.3.8	Field Precision.....	3
2	DATA USABILITY SUMMARY	4

List of Tables

Table 1: Completeness by Method

Table 2: Field Sample Identification and Laboratory Identification

Table 3: Qualified Analytical Data

1 INTRODUCTION

AECOM reviewed 27 data packages from Microbac Laboratory Services, Marietta, OH. Groundwater samples were collected January 30, 2017 through March 29, 2017 at the Groundwater Treatment Plant (GWTP) at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Air samples were collected and sent to ALS Columbia, Simi Valley, California. AECOM reviewed 1 air data package. Samples from site 18/24 were collected March 2017 in place of ICT (Interception Collection Trenches) sampling. This was to monitor if contaminants were breaking through the trenches. Data were reviewed for conformance to the requirements of the following guidance documents: Automated Data Review by Laboratory Data Consultants (ADR.net), United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, (USEPA, August 2014), and USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review, (USEPA, August 2014).

1.1 Intended Use of Data

The objective of sampling at the GWTP is to monitor effluent streams to confirm compliance with discharge limits.

Analyses performed include:

- SW6850 – Perchlorates by LC/MS/MS
- E350.1 – Nitrogen, Ammonia by Smartchem analyzer
- 365.2 – Orthophosphate by UV-120-IV Spectrophotometer
- E415.1 – Total Organic Carbon by TOC-VWP Analyzer
- SW8260 – Volatiles by GC/MS
- SW8270D – 1,4-dioxane by GC/MS
- SW6010C – Al, Fe, and Se by ICP
- SW6020A – As, Ba, Cd, Cr, Co, Pb, Mn, Ni, Ag, V, Zn by ICP/MS
- SW9056 – Common Anions by ion chromatography
- SW7196A – Hexavalent Cr
- 410.4 – Chemical oxygen demand
- 1664A – Oil and grease
- TO-15 – Air

Table 2 lists the sample identification numbers (IDs) and their associated laboratory IDs. **Table 3** lists qualified results with the associated quality control parameter that was exceeded.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good

condition, and with the required signatures with the exception of samples L17021201-01 (LH18/24-SP650-6418-grab) and L17021203-01 (LH18/24-SP140-7418-grab). Samples were received in the laboratory near the hold time limit and were analyzed one hour outside hold time. The samples are non-detect and are qualified UJ.

Table 3 shows qualified analytical data.

1.3 Calibrations

Initial calibration criteria modification includes relative standard deviation (RSD) < or = to 30%, two compounds allowed up to 40%. If the continuing calibration verification (CCV) compound exceeds 20% drift, the compound is checked in the laboratory control sample (LCS), if both are outside recovery limits, the compound is rejected, R. If only the CCV exceeds recovery criteria and is less than $\pm 20\%$ drift, then the compound is qualified J or UJ.

1.3.1 Continuing Calibration Verifications

1.3.1.1 SW8260

CCV WG607453-02 has 2-chlorotoluene at 79%. The associated sample is non-detect and is UJ qualified.

Table 3 shows qualified analytical data.

1.3.2 Low Level Calibration Verification

All low level calibration verifications are within acceptance criteria.

1.3.3 Blanks

Contamination by a target analyte of one of the various blanks was found. If the sample result for an associated sample was non-detect or less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, the corresponding sample result for the analyte was qualified U. Where the sample result for the affected analyte was greater than 5X the amount in the blank, no qualifier was applied.

Trip blank collected 3/6/17 has acetone at 2.53 micrograms per liter ($\mu\text{g/L}$) and the corresponding sample has a trace hit of acetone and is U qualified at the concentration.

Table 3 shows qualified analytical data.

1.3.4 Surrogates

LH18/24-SP650-6423-grab has 1,4-dioxane-d8 at 163%, limit is 20-129%. Associated sample has a positive hit of 1,4-dioxane and is J qualified.

LH18/24-SP140-7428-grab has 1,4-dioxane-d8 at 486%, limit is 20-129%. Associated sample has a positive hit of 1,4-dioxane and is J qualified.

Table 3 shows qualified analytical data.

1.3.5 Laboratory Control Sample

1.3.5.1 SW8270

LCS WG608522-02 and -03 have a relative percent difference (RPD) at 36.4%, the limit is 30%. The associated sample has a positive hit of 1,4-dioxane and is J qualified.

1.3.5.2 TO-15

Lab control sample run on 4/17/17 has trichlorofluoromethane at 99%, control limits are 63-98%. Carbon disulfide is 107%, control limits are 57-102%. The associated samples have positive hits and are J qualified for trichlorofluoromethane.

Table 3 shows qualified analytical data.

1.3.6 Matrix Spike/Matrix Spike Duplicate

1.3.6.1 SW6010C

18WW08-032017 is above control limits for the matrix spike duplicate (MSD) at 157% for sodium. The matrix spike (MS) is within limits. The average of the two recoveries is still above limits. The control limits for sodium are 80-120%. The parent sample is J qualified.

1.3.6.2 SW6020A

18WW08-032017 is above control limits for the MSD at 131% for manganese. The MS is within limits at 105%. The average of the two recoveries is within control limits and no qualification is necessary.

Table 3 shows qualified analytical data.

1.3.7 Internal Standards

If the %RI for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

LH18/24-SP650-6422-grab has perchlorate-d18 recovery at 42%, area limit are 50-150%. Sample is non-detect and is UJ qualified.

Table 3 shows qualified analytical data.

1.3.8 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the RPD. The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at 0-30% for groundwater matrices. No data required qualification based field duplicate RPD outliers. Overall field precision was acceptable.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project. The data quality objectives have been met for the project.

Table 1: Completeness by Method

Method	No. of Rejected Results	% Completeness
SW6850	0	100
E350.1	0	100
365.2	0	100
E415.1	0	100
E1664	0	100
SW8260	0	100
SW6010	0	100
SW6020	0	100
SW9056	0	100
SW7196A	0	100
410.4	0	100
TO-15	0	100

Table 2: Field Sample Identification and Laboratory Identification

Client Sample ID	Lab Sample ID	SW6850	E350.1	E365.2	E415.1	SW8270	SW8260	SW6010	SW6020	SW9056	SW7196A	E410.4	1664	TO-15
GWTP samples														
LH18/24-SP650-6416-grab	L17020838-01 (1701251)	X												
LH18/24-SP650-6417-grab	L17021199-01									X				
LH18/24-SP650-6418-grab	L17021201-01					X	X	X (Se)	X (Ag Ba,Pb)		X			
LH18/24-SP650-6419-grab	L17021202-01		X	X	X									
LH18/24-SP140-7418-grab	L17021203-01							X (Se)	X (Ag)					
LH18/24-SP140-7418-grab	L17021204-01 (1702204)	X												
LH18/24-SP650-6417-grab	L17030057-01 (1702196)	X												
LH18/24-SP650-6420-grab	L17030058-01		X	X	X									
LH18/24-SP650-6420--grab	L17031145-01 (1703035)	X												
LH18/24-SP650-6421	L17030342-01						X			X				
Trip blank	L17030342-02						X							
LH18/24-SP650-6421-grab	L17030706-01 (418362)	X												
LH18/24-SP650-6422-grab	L17030455-01		X	X	X									
LH18/24-SP650-6422-grab	L17031335-01 (1703094)	X												
LH18/24-SP140-7423-grab	L17030723-01							X (Se)	X (Ag)		X			
LH18/24-SP140-7423-grab	L17031398-01 (418454)	X												
LH18/24-SP650-6423-grab	L17030724-01					X	X	X (Se)	X (Ag Ba,Pb)		X			

Client Sample ID	Lab Sample ID	SW6850	E350.1	E365.2	E415.1	SW8270	SW9260	SW6010	SW6020	SW9056	SW7196A	E410.4	1664	TO-15
Trip blank	L17030724-02						X							
LH18/24-SP650-6423-grab	L17031117-01 (418450)													
LH18/24-SP650-6424-grab	L17030851-01		X	X	X									
LH-18/24-SP650-6424-grab	L17030878-01 (418681)	X												
LH18/24-SP650-6425	L17031141-01						X			X				
Trip blank	L17031141-02						X							
LH18/24-SP650-6425	L17031560-01 (418939)	X												
LH18/24-SP650-6426-grab	L17031259-01		X	X	X									
LH18/24-SP650-6426-grab	L17031558-01 (419110)	X												
LH18/24-SP140-7428-grab	L17031689-01					X	X	X	X	X		X	X	
Trip blank	L17031689-02						X							
LH18/24-SP650-6428-grab	L17031690-01					X	X	X	X	X		X	X	
Trip blank	L17031690-02						X							
LH18/24-SP140-7428-grab	L17040028-01 (419536)	X												
LH18/24-SP650-6428-grab	L17040029-01 (419533)	X												
Air samples														
LH18/24-air-5427-stripper	P1701582-001													X
LH18/24-air-5427-stripper dup	P1701582-002													X
LH18/24-air-5427-GWTP	P1701582-003													X
LH18/24-air-5424-downwind north	P1701582-004													X

Client Sample ID	Lab Sample ID	SW6850	E350.1	E365.2	E415.1	SW8270	SW9260	SW6010	SW6020	SW9056	SW7196A	E410.4	1664	TO-15
Site 18/24														
18WW08-032017	L17031161-01						X	X	X					
18WW08MS-032017	L17031161-02						X	X	X					
18WW08MSD-032017	L17031161-03						X	X	X					
18CPTMW23SW-032017	L17031161-04						X	X	X					
18WW24-032017	L17031161-05						X	X	X					
18WW25-032017	L17031161-06						X							
18WW25F-032017	L17031161-07							X	X					
MW10-032017	L17031161-08						X							
MW10F-032017	L17031161-09													
Trip blank	L17031161-10						X							
18WW08-032017	L17031222-01	X												
18CPTMW23SW-032017	L17031222-02	X												
18WW24-032017	L17031222-03	X												
18WW25-032017	L17031222-04	X												
MW10-032017	L17031222-05	X												
126-032117	L17031339-01						X							
126F-032117	L17031339-02							X	X					
126FD-032117	L17031339-03						X							
126DF-032117	L17031339-04													
MW2-032117	L17031339-05													
18CPTMW01DW-032117	L17031339-06						X	X	X					
18CPTMW01SW-032117	L17031339-07						X	X	X					
MW13-032117	L17031339-08						X	X	X					

Quality Control Summary Report
 GWTP 1st Quarter 2017 (January-March)
 Longhorn Army Ammunition Plant, Karnack, Texas

August 2017

Client Sample ID	Lab Sample ID	SW6850	E350.1	E365.2	E415.1	SW8270	SW8260	SW6010	SW6020	SW9056	SW7196A	E410.4	1664	TO-15
MW13FD-032117	L17031339-09						X	X	X					
CO2-032117	L17031339-10						X							
CO2F-032117	L17031339-11							X	X					
MW16-032217	L17031339-12						X							
MW16F-032217	L17031339-13							X	X					
MW19-032217	L17031339-14						X							
MW19F-032217	L17031339-15							X	X					
Trip blank	L17031339-16						X							
126-032117	L17031362-01	X												
126FD-032117	L17031362-02	X												
MW2-032117	L17031362-03	X												
18CPTMW01DW-032217	L17031362-04	X												
18CPTMW01SW-032117	L17031362-05	X												
MW13-032117	L17031362-06	X												
MW13FD-032117	L17031362-07	X												
CO2-032117	L17031362-08	X												
MW16-032217	L17031362-09	X												
MW19-032217	L17031362-10	X												

GWTP – Groundwater Treatment Plant
 ID – Identification

Table 3: Qualified Analytical Data

Client Sample ID	Lab Sample ID	Analyte Name	DV Qual Overall	Reason
GWTP samples				
LH18/24-SP650-6418-grab	L17021201-01	Hexavalent chromium	UJ	Hold time exceedance
LH18/24-SP140-7418-grab	L17021203-01	Hexavalent chromium	UJ	Hold time exceedance
LH18/24-SP650-6421-grab	L17030342-01	Acetone	U	Trip blank contamination
LH18/24-SP650-6422-grab	L17031335-01	Perchlorate	UJ	Internal standard low recovery
LH18/24-SP650-6423-grab	L17030724-01	1,4-dioxane	J	Surrogate recovery above control limits
LH18/24-SP140-7428-grab	L17031689-01	1,4-dioxane	J	Surrogate recovery above the control limits
LH18/24-SP650-6428-grab	L17031690-01	1,4-dioxane	J	LCS/LCSD recoveries above the control limits
Air samples				
LH18/24-air-5427-GWTP	P1701582-003	Trichlorofluoromethane	J	LCS recovery above control limits
LH18/24-air-5427-downwind north	P1701582-004	Trichlorofluoromethane	J	LCS recovery above control limits
Site 18/24 samples				
18WW24-032017	L17031161-05	2-Chlorotoluene	UJ	CCV below control limits
18WW08-032017	L17031161-01	Sodium	J	MSD above control limits

DV – data validation

GWTP – Groundwater Treatment Plant

ID – identification

Qual - quality

J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U – Undetected: The analyte was analyzed for, but not detected.

UJ – The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.



March 14, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 418450

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 14, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	43
Miscellaneous.....	63

Case Narrative

**Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 418450**

March 14, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 14, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

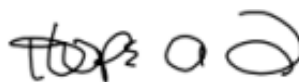
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
418450001	LH18/24-SP650-6423-Grab

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.



Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: <u>MBAC</u>	SDG/AR/COC/Work Order: <u>418450 / 418454</u>
Received By: <u>AG</u>	Date Received: <u>3/14/17</u>
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other
	<u>J461 688 383 5</u>

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
COC/Samples marked as radioactive?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>122-11</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AG Date 3/14/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 14 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
 Technical Case Narrative
 Microbac Laboratories, Inc Kentucky Division (MBAC)
 SDG #: 418450**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1647141

Prep Batch Number: 1647140

Sample Analysis

Sample ID	Client ID
418450001	418450001 (LH18/24-SP650-6423-Grab)
1203746617	Interference Check Sample (ICS)
1203746613	Method Blank (MB)
1203746614	Laboratory Control Sample (LCS)
1203746615	418450001(LH18/24-SP650-6423-Grab) Matrix Spike (MS)
1203746616	418450001(LH18/24-SP650-6423-Grab) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418450001 (LH18/24-SP650-6423-Grab) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203746615 (MS) a high recovery for Perchlorate was observed. The recovery was 296% and the acceptance range is 75-125%. In 1203746616 (MSD) a 0% recovery was observed. The detected concentration in the MSD was lower than that detected in the parent sample. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418450001 (LH18/24-SP650-6423-Grab) and the need to dilute all at a 1:20 dilution prior to analysis. 1203746615 (LH18/24-SP650-6423-GrabMS) and 1203746616 (LH18/24-SP650-6423-GrabMSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203746615 (LH18/24-SP650-6423-GrabMS), 1203746616 (LH18/24-SP650-6423-GrabMSD) and 418450001 (LH18/24-SP650-6423-Grab) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information**Data Exception (DER) Documentation**

A data exception report (DER) 1613708 was generated for samples 1203746615 (LH18/24-SP650-6423-GrabMS) and 1203746616 (LH18/24-SP650-6423-GrabMSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 418450 GEL Work Order: 418450

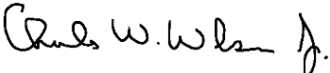
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 15 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-Grab

Date Received: 14-MAR-17

GEL Job No (SDG): 418450

GEL Sample ID: 418450001

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	30.1	ug/L		20	14-MAR-17 16:59	per0314016a
	Perchlorate-O(18)			9.84	ug/L		20	14-MAR-17 16:59	per0314016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 418450

Extract Batch Code: 1647140

Date Filtered: 14-MAR-17

Matrix: WATER

Sample ID: 1203746614

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.192	ug/L	96		85 - 115
Perchlorate-O(18)		.494	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 418450Extract Batch Code: 1647140Date Filtered: 14-MAR-17Matrix: WATERSample ID: 1203746617

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		70 - 130
Perchlorate-O(18)		.521	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 418450Extract Batch Code: 1647140Date Extracted: 14-MAR-17GEL MS/PS ID: 1203746615Client ID: LH18/24-SP650-6423-GrabGEL MSD/PSD ID: 1203746616QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	30.1	ug/L	30.6	296 *	27.5	0 *	11	30	75 - 125
Perchlorate-O(18)	0	9.84	ug/L	10.0		10.1		1		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0314006a	14-MAR-17	20443.8				
Lower Area Limit			10221.9				
Upper Area Limit			30665.7				
1203746613	per0314013a	14-MAR-17 16:30	19571.7	3.56	3.61968	1.017	
1203746614	per0314014a	14-MAR-17 16:40	19711.6	3.56	3.59217	1.009	
1203746617	per0314015a	14-MAR-17 16:49	20813.9	3.4	3.42667	1.008	
418450001	per0314016a	14-MAR-17 16:59	19635.6	3.56	3.59217	1.009	
1203746615	per0314017a	14-MAR-17 17:08	20018.9	3.56	3.59217	1.009	
1203746616	per0314018a	14-MAR-17 17:18	20142	3.56	3.59217	1.009	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-Grab

Date Received: 14-MAR-17

GEL Job No (SDG): 418450

GEL Sample ID: 418450001

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	30.1	ug/L		20	14-MAR-17 16:59	per0314016a
	Perchlorate-O(18)			9.84	ug/L		20	14-MAR-17 16:59	per0314016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

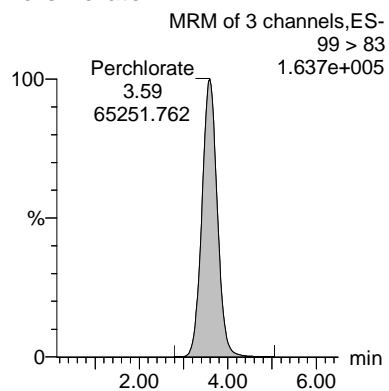
CWW

03/15/2017

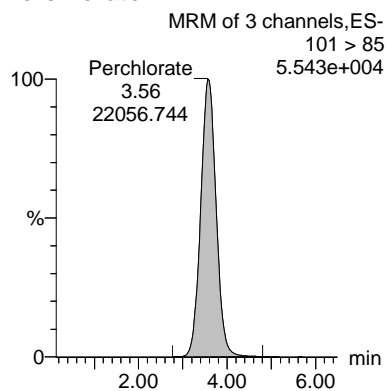
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314016a
Date: 14-Mar-2017
Time: 16:59:12
ID: 418450001
Vial: 1:3,D

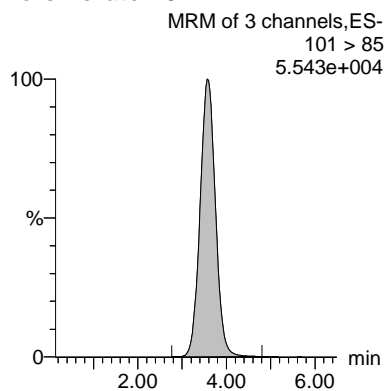
Perchlorate



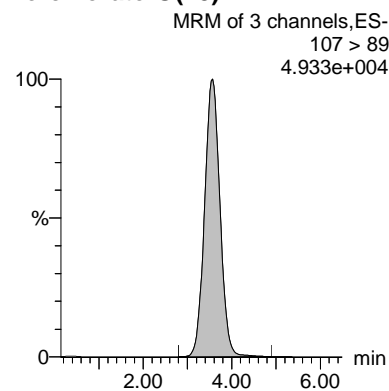
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
418450001	Perchlorate	99 > 83	3.59	65251.762	1.662	bb			1.5028			4518.9... 2.96
418450001	Perchlorate-101	101 > 85	3.56	22056.744	0.562	bb			1.5281			2211.9...
418450001	Perchlorate-O(18)	107 > 89	3.56	19635.633	19635.633	bb			0.4919	98.37	-1.63	3078.6...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 418450

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 14-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate

Coefficient of Determination: .

Calibration Curve: 1.105

Response Type: Internal Standard

Curve Type: RF

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 14-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .36667Response Type: Internal StandardCurve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld

Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time

Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031417a.mdb 15 Mar 2017 08:56:13

Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031417a.cdb 15 Mar 2017 08:56:55

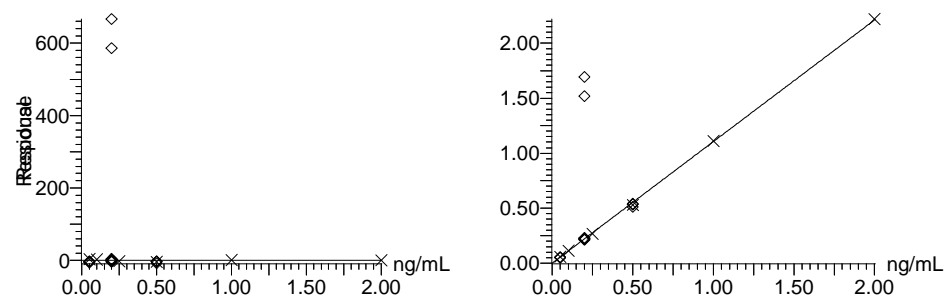
Compound name: Perchlorate

Response Factor: 1.10564

RRF SD: 0.0317675, % Relative SD: 2.87321

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



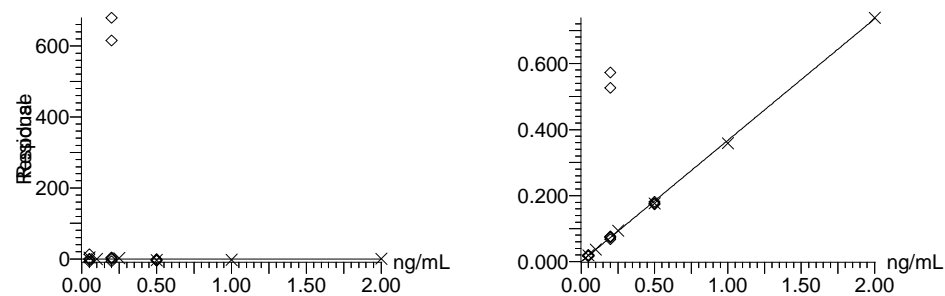
Compound name: Perchlorate-101

Response Factor: 0.367544

RRF SD: 0.0100258, % Relative SD: 2.72778

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld

Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time

Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

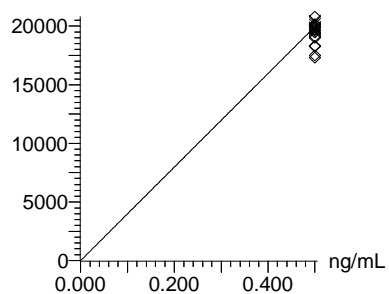
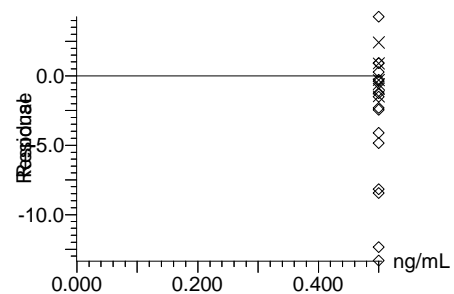
Compound name: Perchlorate-O(18)

Response Factor: 39920.8

RRF SD: 568.938, % Relative SD: 1.42517

Response type: External Std, Area

Curve type: RF



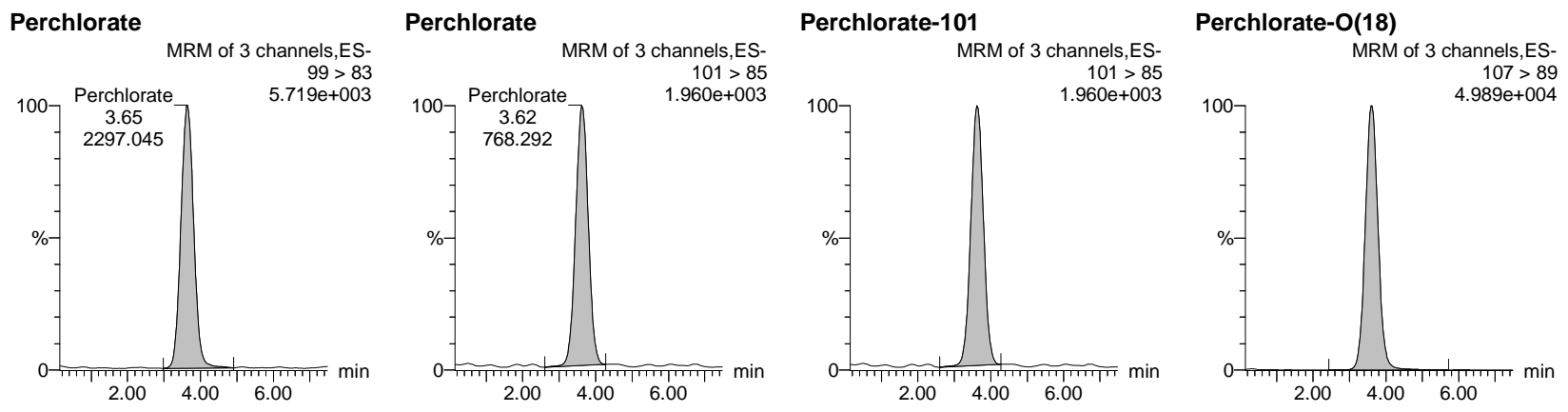
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314003a
Date: 14-Mar-2017
Time: 14:43:37
ID: WCL170306-01
Vial: 1:1,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-01	Perchlorate	99 > 83	3.65	2297.045	0.057	bb			0.0516	103.17	3.17	391.685	2.99
WCL170306-01	Perchlorate-101	101 > 85	3.62	768.292	0.019	bb			0.0519	103.80	3.80	179.220	
WCL170306-01	Perchlorate-O(18)	107 > 89	3.59	20137.695	20137.695	bb			0.5044	100.89	0.89	2927.9...	

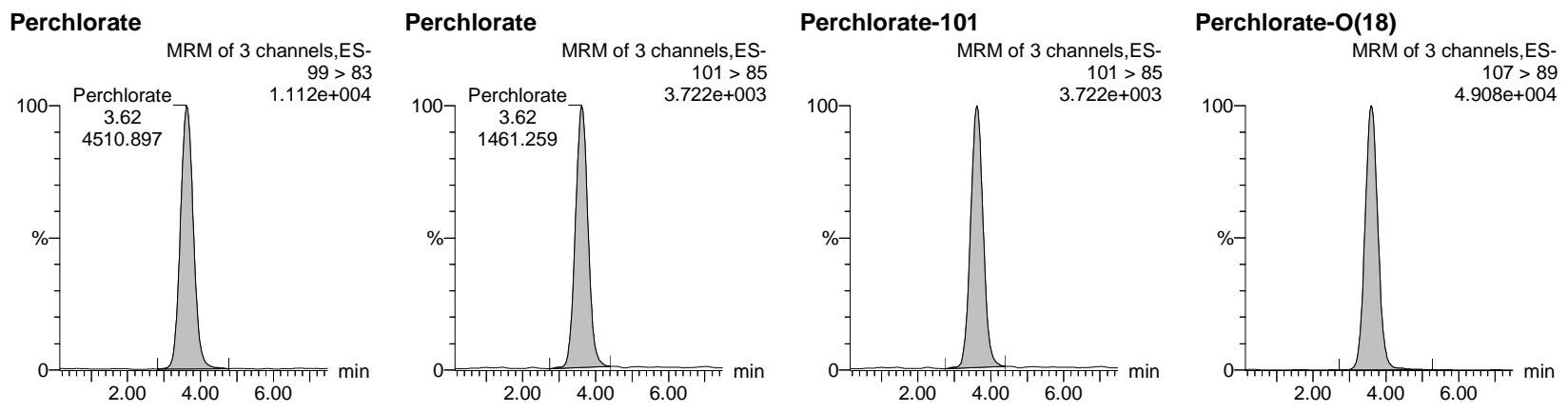
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314004a
Date: 14-Mar-2017
Time: 14:54:04
ID: WCL170306-02
Vial: 1:1,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-02	Perchlorate	99 > 83	3.62	4510.897	0.113	bb			0.1025	102.51	2.51	314.128	3.09
WCL170306-02	Perchlorate-101	101 > 85	3.62	1461.259	0.037	bb			0.0999	99.89	-0.11	444.297	
WCL170306-02	Perchlorate-O(18)	107 > 89	3.59	19899.643	19899.643	bb			0.4985	99.70	-0.30	3206.7...	

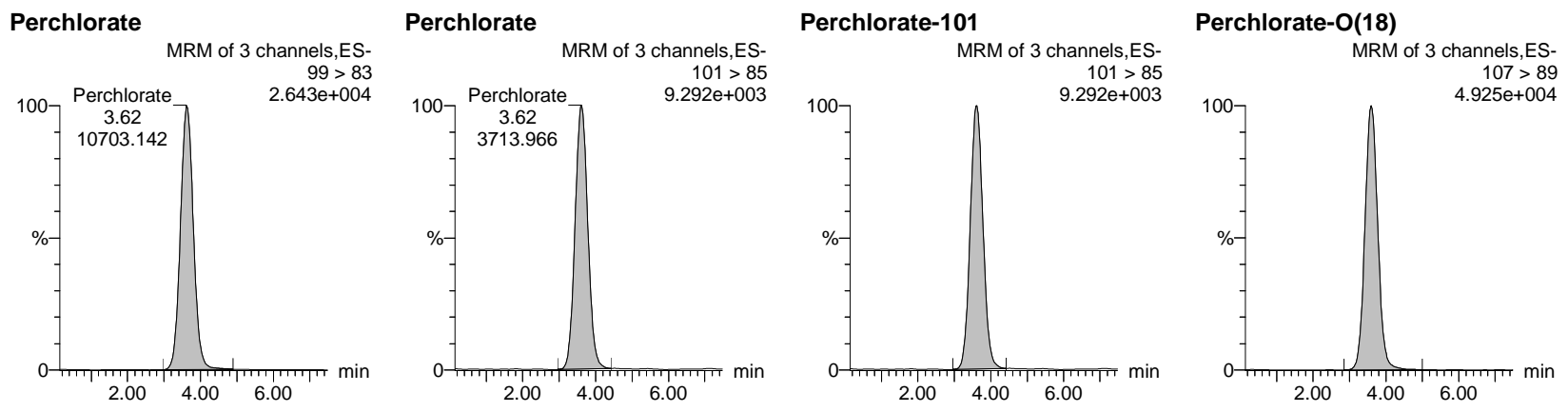
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314005a
Date: 14-Mar-2017
Time: 15:04:31
ID: WCL170306-03
Vial: 1:1,D



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-03	Perchlorate	99 > 83	3.62	10703.142	0.270	bb			0.2440	97.58	-2.42	1457.3...	2.88
WCL170306-03	Perchlorate-101	101 > 85	3.62	3713.966	0.094	bb			0.2547	101.86	1.86	1029.1...	
WCL170306-03	Perchlorate-O(18)	107 > 89	3.59	19840.367	19840.367	bb			0.4970	99.40	-0.60	2276.3...	

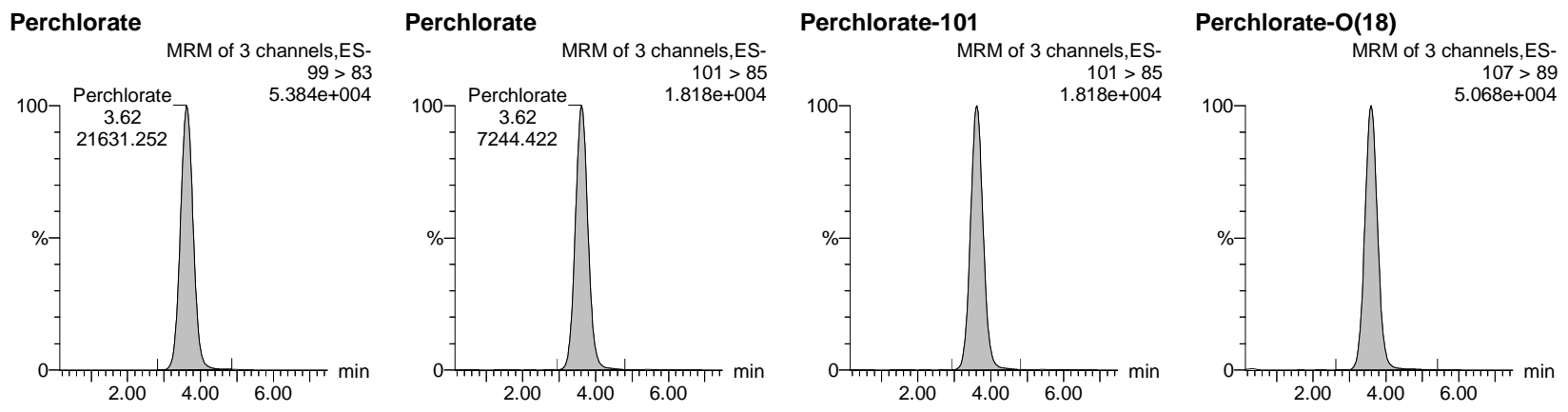
CWW

03/15/2017

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314006a
Date: 14-Mar-2017
Time: 15:14:56
ID: WCL170306-04
Vial: 1:1,E

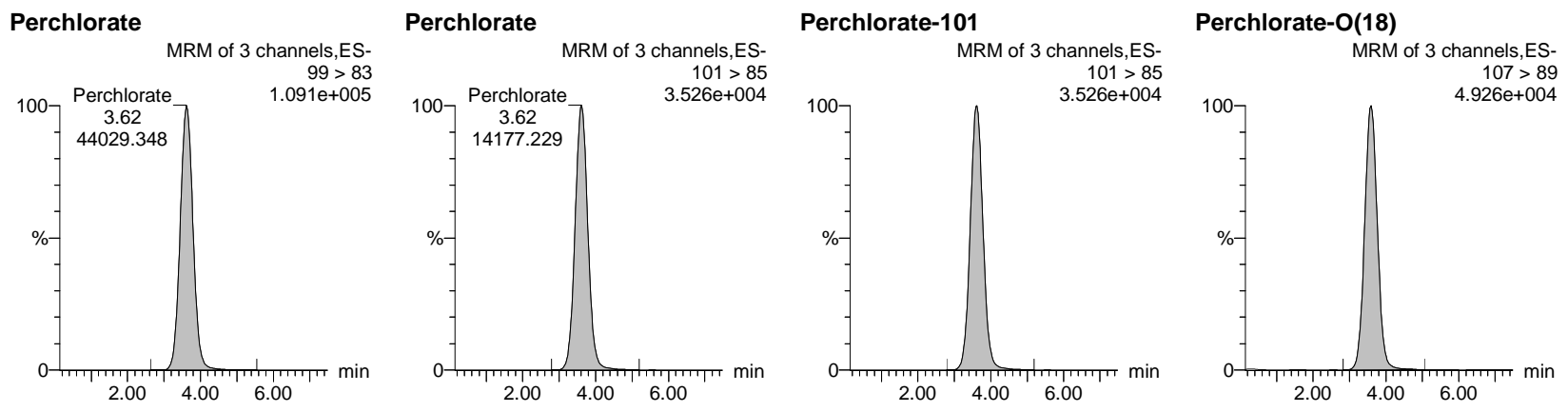


ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-04	Perchlorate	99 > 83	3.62	21631.252	0.529	bb			0.4785	95.70	-4.30	8795.9...	2.99
WCL170306-04	Perchlorate-101	101 > 85	3.62	7244.422	0.177	bb			0.4821	96.41	-3.59	2986.7...	
WCL170306-04	Perchlorate-O(18)	107 > 89	3.59	20443.789	20443.789	bb			0.5121	102.42	2.42	3387.3...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314007a
Date: 14-Mar-2017
Time: 15:25:22
ID: WCL170306-05
Vial: 1:1,F



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-05	Perchlorate	99 > 83	3.62	44029.348	1.113	bb			1.0068	100.68	0.68	1856.0...	3.11
WCL170306-05	Perchlorate-101	101 > 85	3.62	14177.229	0.358	bb			0.9752	97.52	-2.48	7225.7...	
WCL170306-05	Perchlorate-O(18)	107 > 89	3.59	19776.561	19776.561	bb			0.4954	99.08	-0.92	1895.7...	

CWW

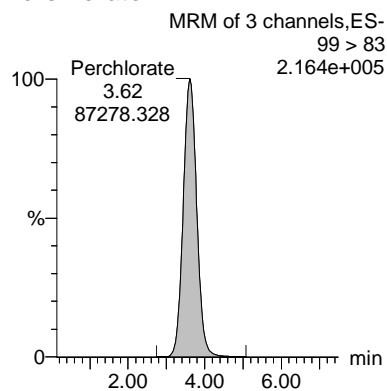
03/15/2017

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

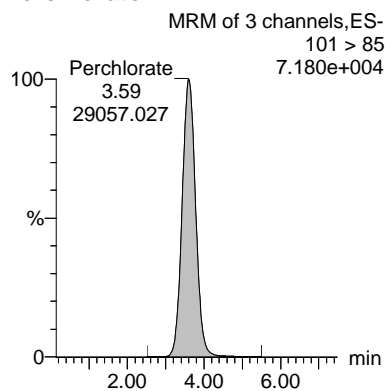
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314008a
Date: 14-Mar-2017
Time: 15:35:48
ID: WCL170306-06
Vial: 1:2,A

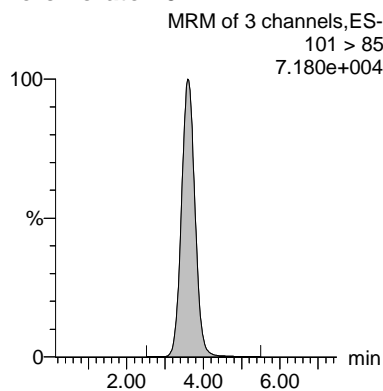
Perchlorate



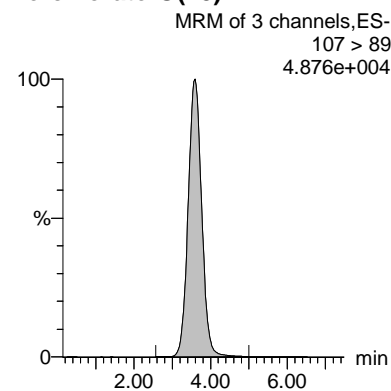
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-06	Perchlorate	99 > 83	3.62	87278.328	2.219	bb			2.0072	100.36	0.36	12668....	3.00
WCL170306-06	Perchlorate-101	101 > 85	3.59	29057.027	0.739	bb			2.0102	100.51	0.51	4395.4...	
WCL170306-06	Perchlorate-O(18)	107 > 89	3.59	19664.396	19664.396	bb			0.4926	98.52	-1.48	4608.7...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELReporting Units: ug/L

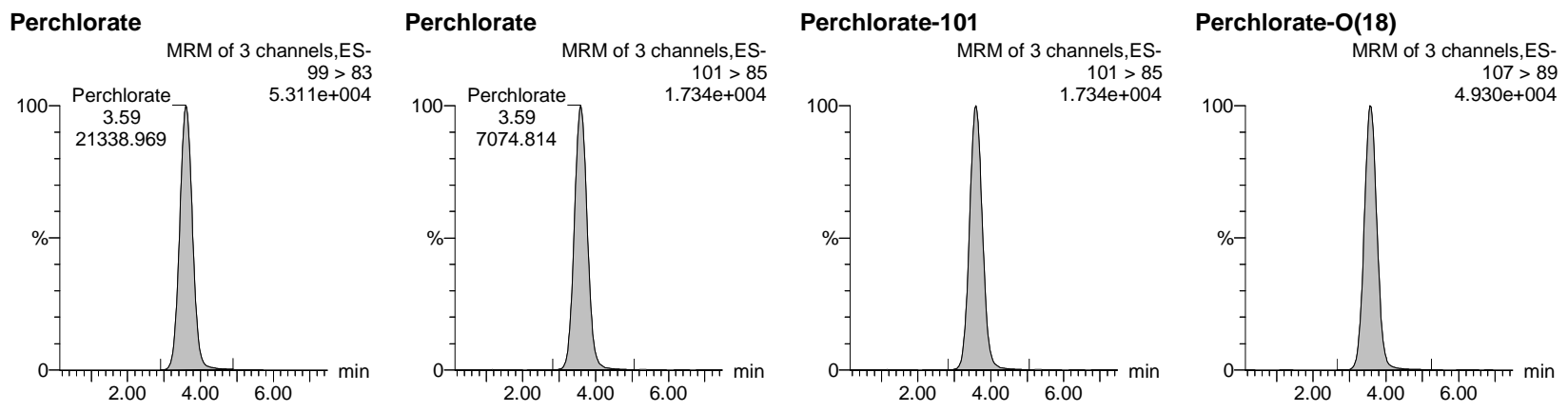
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.07	14-MAR-17 15:56	per0314010a
Perchlorate Isotope Ratio		3.02		14-MAR-17 15:56	per0314010a
Perchlorate-101	.5	.48	96.81	14-MAR-17 15:56	per0314010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314010a
Date: 14-Mar-2017
Time: 15:56:42
ID: WCL170306-07ICV
Vial: 1:2,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07ICV	Perchlorate	99 > 83	3.59	21338.969	0.537	bb			0.4853	97.07	-2.93	1982.6...	3.02
WCL170306-07ICV	Perchlorate-101	101 > 85	3.59	7074.814	0.178	bb			0.4840	96.81	-3.19	2558.1...	
WCL170306-07ICV	Perchlorate-O(18)	107 > 89	3.56	19883.162	19883.162	bb			0.4981	99.61	-0.39	2357.0...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.36	14-MAR-17 18:05	per0314023a
Perchlorate Isotope Ratio		3.07		14-MAR-17 18:05	per0314023a
Perchlorate-101	.5	.48	95.45	14-MAR-17 18:05	per0314023a

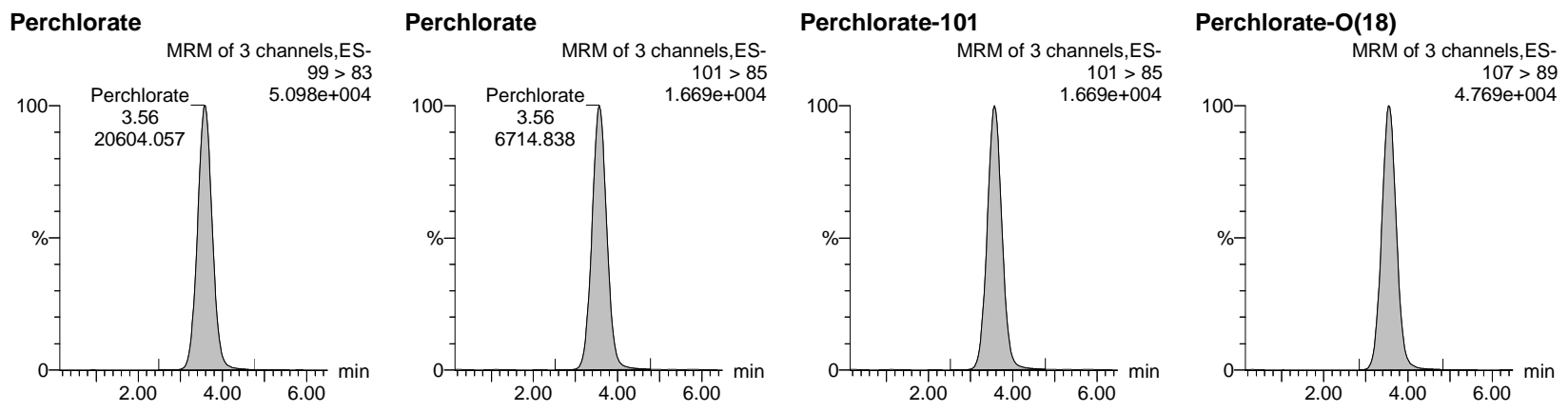
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314023a
Date: 14-Mar-2017
Time: 18:05:28
ID: WCL170306-07CCV
Vial: 1:2,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07CCV	Perchlorate	99 > 83	3.56	20604.057	0.538	bb			0.4868	97.36	-2.64	2165.7...	3.07
WCL170306-07CCV	Perchlorate-101	101 > 85	3.56	6714.838	0.175	bb			0.4773	95.45	-4.55	1096.5...	
WCL170306-07CCV	Perchlorate-O(18)	107 > 89	3.54	19139.893	19139.893	bb			0.4794	95.89	-4.11	1403.6...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELReporting Units: ug/L

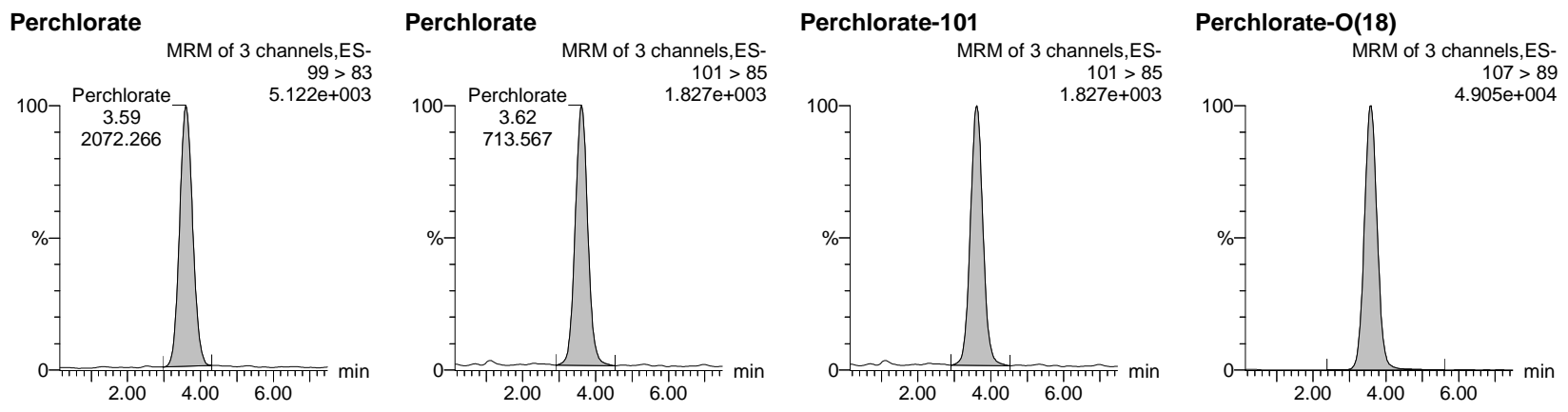
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	94.16	14-MAR-17 16:17	per0314012a
Perchlorate Isotope Ratio		2.9		14-MAR-17 16:17	per0314012a
Perchlorate-101	.05	.05	97.54	14-MAR-17 16:17	per0314012a
Perchlorate	.05	.05	97.21	14-MAR-17 18:24	per0314025a
Perchlorate Isotope Ratio		3.18		14-MAR-17 18:24	per0314025a
Perchlorate-101	.05	.05	91.99	14-MAR-17 18:24	per0314025a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314012a
Date: 14-Mar-2017
Time: 16:17:37
ID: WCL170306-08CRI
Vial: 1:2,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.59	2072.266	0.052	bb			0.0471	94.16	-5.84	241.525	2.90
WCL170306-08CRI	Perchlorate-101	101 > 85	3.62	713.567	0.018	bb			0.0488	97.54	-2.46	273.714	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.59	19904.623	19904.623	bb			0.4986	99.72	-0.28	3531.2...	

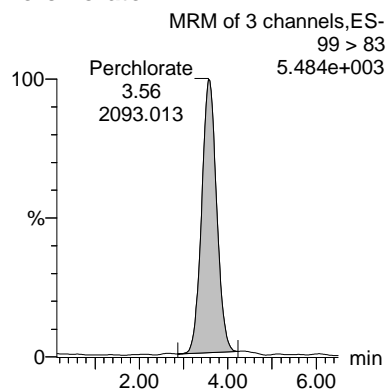
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

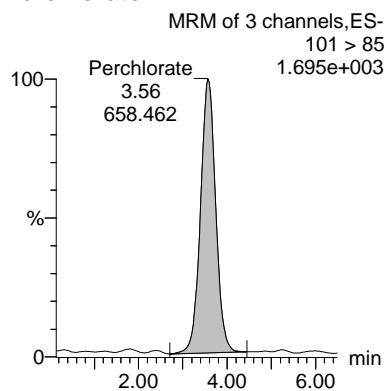
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314025a
Date: 14-Mar-2017
Time: 18:24:22
ID: WCL170306-08CRI
Vial: 1:2,C

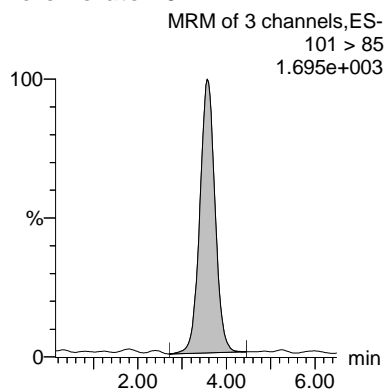
Perchlorate



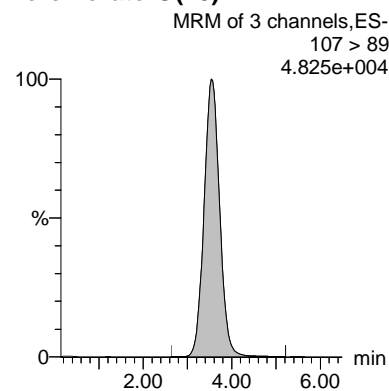
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.56	2093.013	0.054	bb			0.0486	97.21	-2.79	305.881	3.18
WCL170306-08CRI	Perchlorate-101	101 > 85	3.56	658.462	0.017	bb			0.0460	91.99	-8.01	165.819	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.54	19474.150	19474.150	bb			0.4878	97.56	-2.44	3359.8...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

MB

Date Received: 14-MAR-17

GEL Job No (SDG): 418450

GEL Sample ID: 1203746613

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	14-MAR-17 16:30	per0314013a
	Perchlorate-O(18)			0.490	ug/L		1	14-MAR-17 16:30	per0314013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

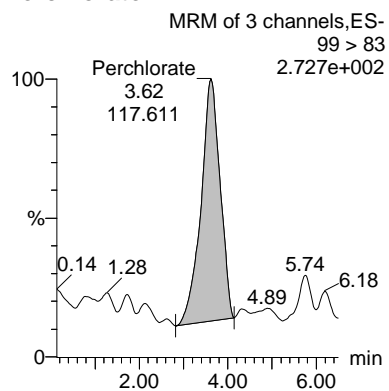
CWW

03/15/2017

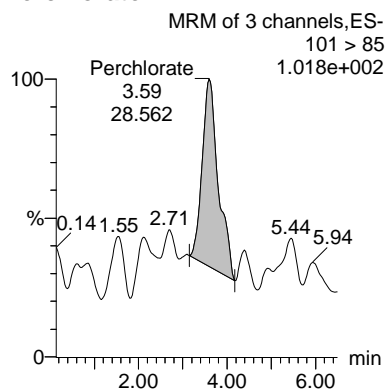
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314013a
Date: 14-Mar-2017
Time: 16:30:48
ID: 1203746613
Vial: 1:3,A

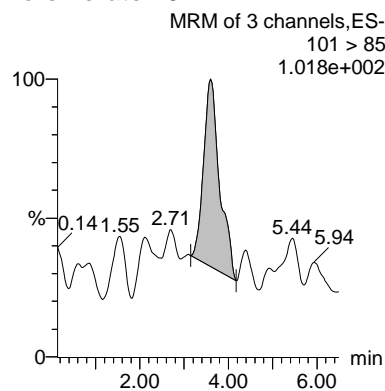
Perchlorate



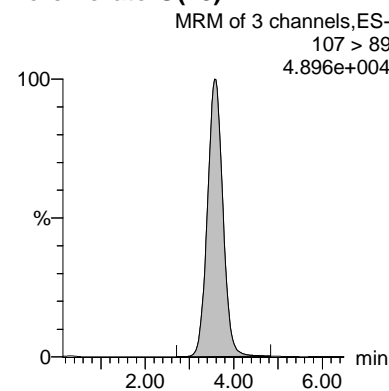
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203746613	Perchlorate	99 > 83	3.62	117.611	0.003	bb			0.0027			27.862 4.12
1203746613	Perchlorate-101	101 > 85	3.59	28.562	0.001	bb			0.0020			9.327
1203746613	Perchlorate-O(18)	107 > 89	3.56	19571.738	19571.738	bb			0.4903	98.05	-1.95	2532.8...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 14-MAR-17

GEL Job No (SDG): 418450

GEL Sample ID: 1203746614

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.192	ug/L	J	1	14-MAR-17 16:40	per0314014a
	Perchlorate-O(18)			0.494	ug/L		1	14-MAR-17 16:40	per0314014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

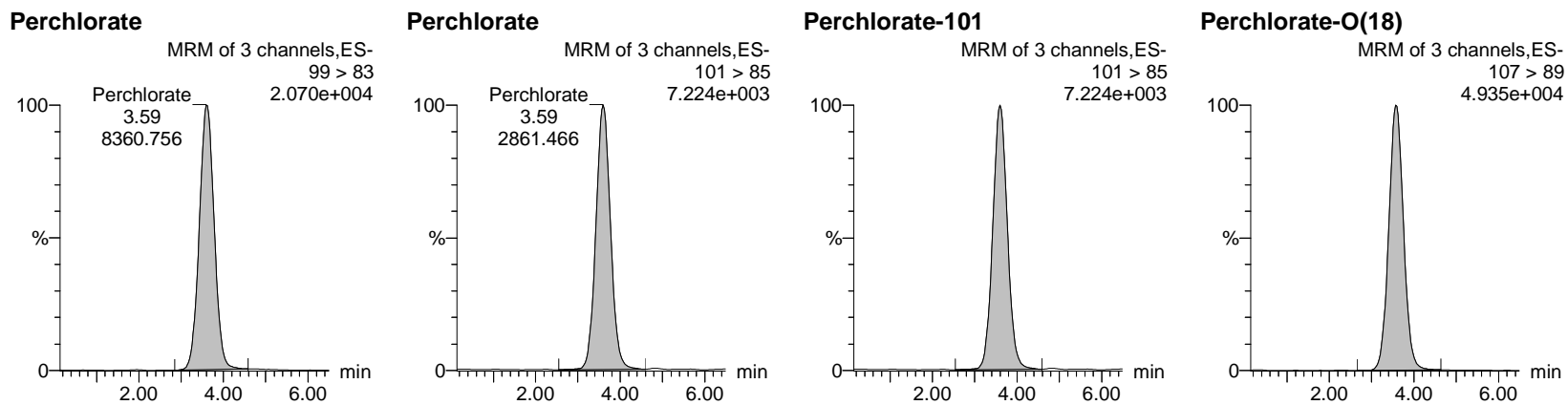
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314014a
Date: 14-Mar-2017
Time: 16:40:16
ID: 1203746614
Vial: 1:3,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746614	Perchlorate	99 > 83	3.59	8360.756	0.212	bb			0.1918	95.91	-4.09	2027.7...	2.92
1203746614	Perchlorate-101	101 > 85	3.59	2861.466	0.073	bb			0.1975	98.74	-1.26	1008.3...	
1203746614	Perchlorate-O(18)	107 > 89	3.56	19711.578	19711.578	bb			0.4938	98.75	-1.25	2895.5...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 418450

GEL Sample ID: 1203746617

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	14-MAR-17 16:49	per0314015a
	Perchlorate-O(18)			0.521	ug/L		1	14-MAR-17 16:49	per0314015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

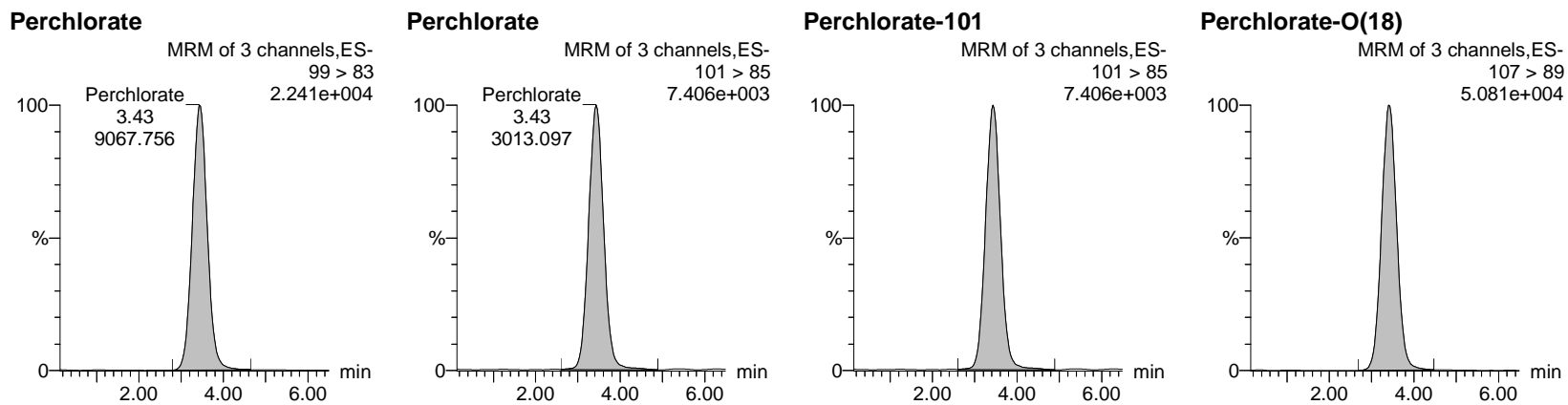
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314015a
Date: 14-Mar-2017
Time: 16:49:44
ID: 1203746617
Vial: 1:3,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746617	Perchlorate	99 > 83	3.43	9067.756	0.218	bb			0.1970	98.51	-1.49	2008.6...	3.01
1203746617	Perchlorate-101	101 > 85	3.43	3013.097	0.072	bb			0.1969	98.47	-1.53	1410.7...	
1203746617	Perchlorate-O(18)	107 > 89	3.40	20813.867	20813.867	bb			0.5214	104.28	4.28	1307.7...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-GrabMS

Date Received: 14-MAR-17

GEL Job No (SDG): 418450

GEL Sample ID: 1203746615

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	30.6	ug/L		20	14-MAR-17 17:08	per0314017a
	Perchlorate-O(18)			10.0	ug/L		20	14-MAR-17 17:08	per0314017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

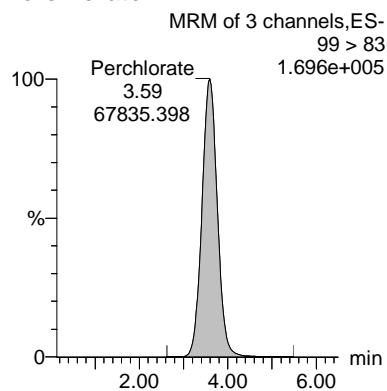
CWW

03/15/2017

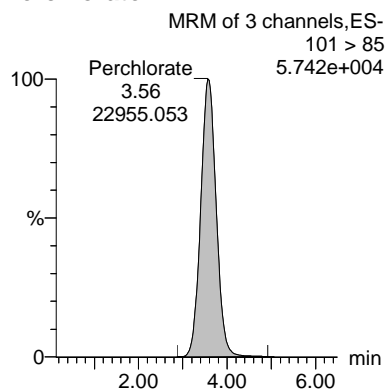
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314017a
Date: 14-Mar-2017
Time: 17:08:39
ID: 1203746615
Vial: 1:3,E

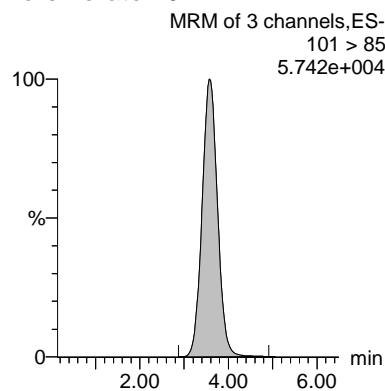
Perchlorate



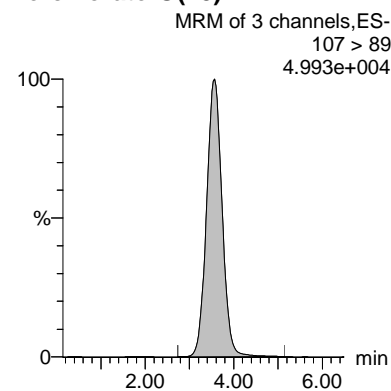
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746615	Perchlorate	99 > 83	3.59	67835.398	1.694	bb			1.5324	766.20	666.20	9858.8...	2.96
1203746615	Perchlorate-101	101 > 85	3.56	22955.053	0.573	bb			1.5599	779.95	679.95	4161.6...	
1203746615	Perchlorate-O(18)	107 > 89	3.56	20018.902	20018.902	bb			0.5015	100.29	0.29	2168.9...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1647140Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-GrabMSDDate Received: 14-MAR-17GEL Job No (SDG): 418450GEL Sample ID: 1203746616Date Filtered: 14-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	27.5	ug/L		20	14-MAR-17 17:18	per0314018a
	Perchlorate-O(18)			10.1	ug/L		20	14-MAR-17 17:18	per0314018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

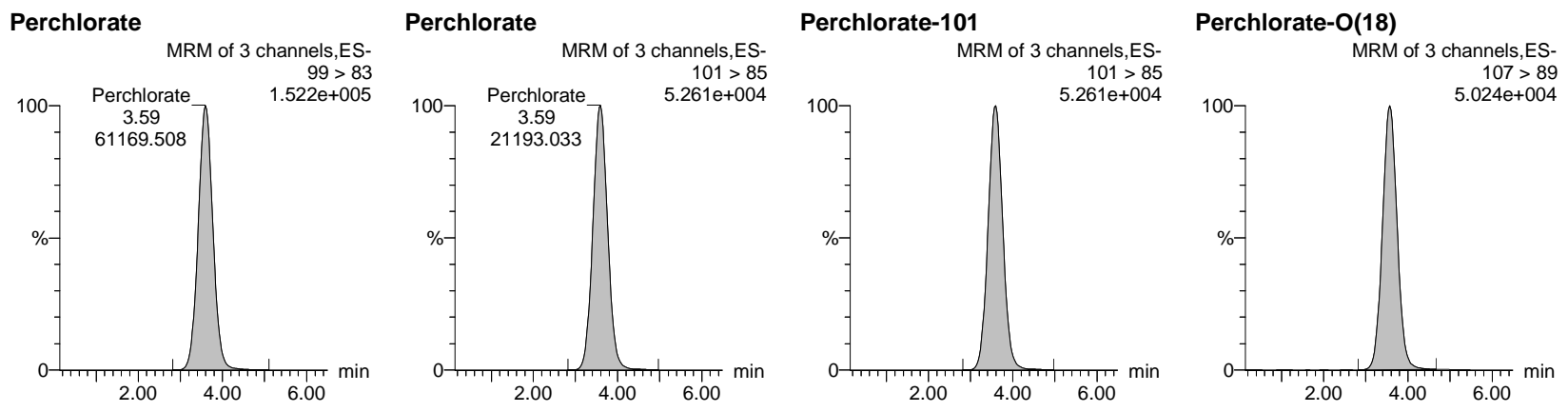
$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314018a
Date: 14-Mar-2017
Time: 17:18:06
ID: 1203746616
Vial: 1:3,F



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746616	Perchlorate	99 > 83	3.59	61169.508	1.518	bb			1.3734	686.69	586.69	5032.5...	2.89
1203746616	Perchlorate-101	101 > 85	3.59	21193.033	0.526	bb			1.4314	715.68	615.68	9892.6...	
1203746616	Perchlorate-O(18)	107 > 89	3.56	20141.959	20141.959	bb			0.5045	100.91	0.91	2081.7...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	14-MAR-17	per0314001a	IPB001
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314001a	IPB001
Perchlorate	0.00	0	NA	14-MAR-17	per0314002a	IPB001
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

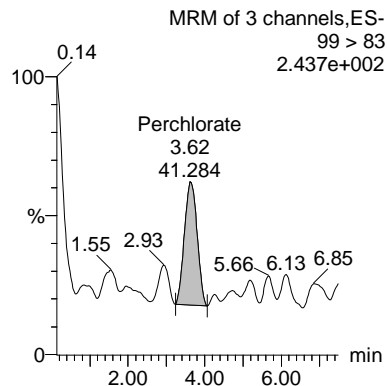
03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

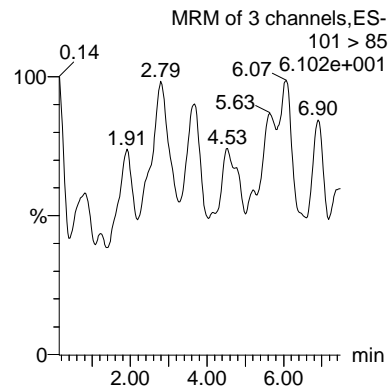
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031417a.mdb 15 Mar 2017 08:56:13
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031417a.cdb 15 Mar 2017 08:56:55

Name: per0314001a
 Date: 14-Mar-2017
 Time: 14:22:39
 ID: IPB001
 Vial: 1:1,A

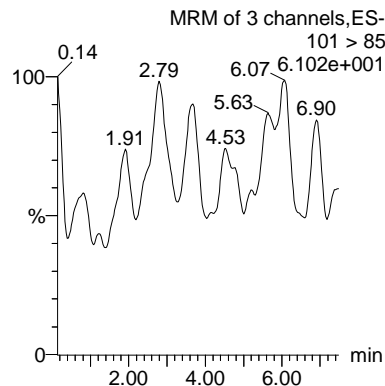
Perchlorate



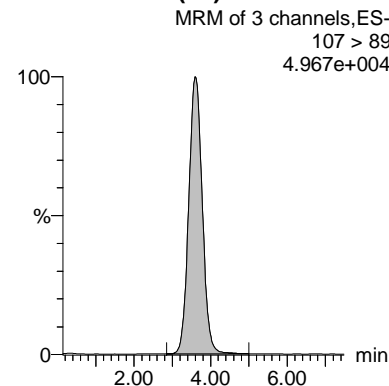
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.62	41.284	0.001	bb			0.0009			6.892 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	3.59	20112.693	20112.693	bb			0.5038	100.76	0.76	4098.1...

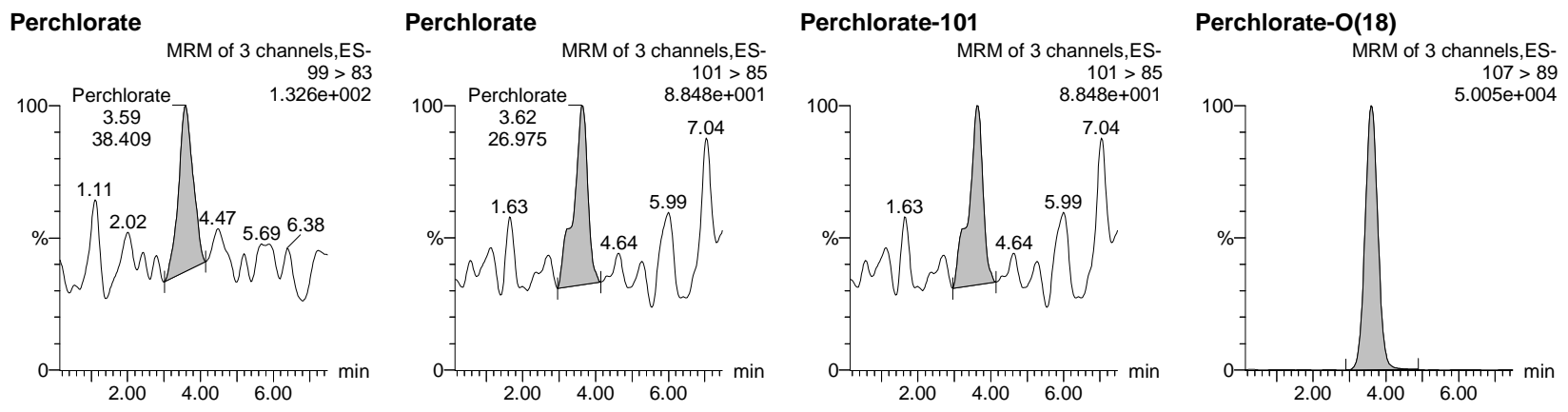
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314002a
Date: 14-Mar-2017
Time: 14:33:10
ID: IPB001
Vial: 1:1,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.59	38.409	0.001	bb			0.0009			7.529 1.42
IPB001	Perchlorate-101	101 > 85	3.62	26.975	0.001	bb			0.0018			7.576
IPB001	Perchlorate-O(18)	107 > 89	3.59	20093.990	20093.990	bb			0.5033	100.67	0.67	4035.5...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418450Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	14-MAR-17	per0314009a	IPB002
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314009a	IPB002
Perchlorate	0.00	0	NA	14-MAR-17	per0314011a	IPB003
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314011a	IPB003
Perchlorate	0.00	0	NA	14-MAR-17	per0314019a	IPB004
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314019a	IPB004
Perchlorate	0.00	0	NA	14-MAR-17	per0314021a	IPB005
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314021a	IPB005
Perchlorate	0.00	0	NA	14-MAR-17	per0314024a	IPB006
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314024a	IPB006

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

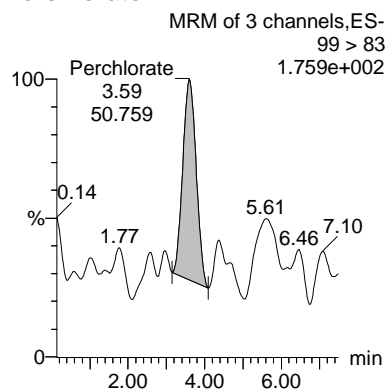
CWW

03/15/2017

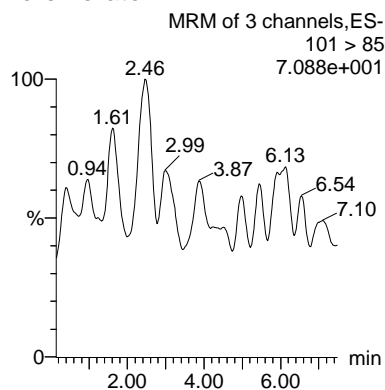
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314009a
Date: 14-Mar-2017
Time: 15:46:15
ID: IPB002
Vial: 1:1,A

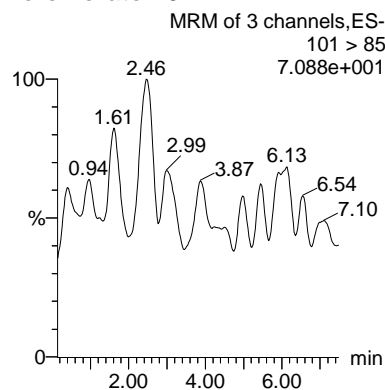
Perchlorate



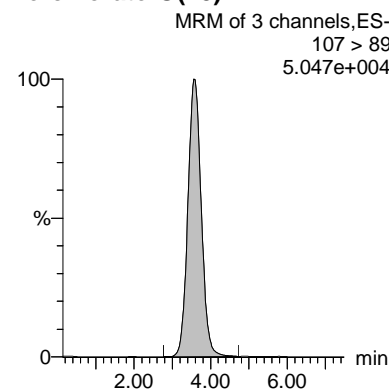
Perchlorate



Perchlorate-101



Perchlorate-O(18)



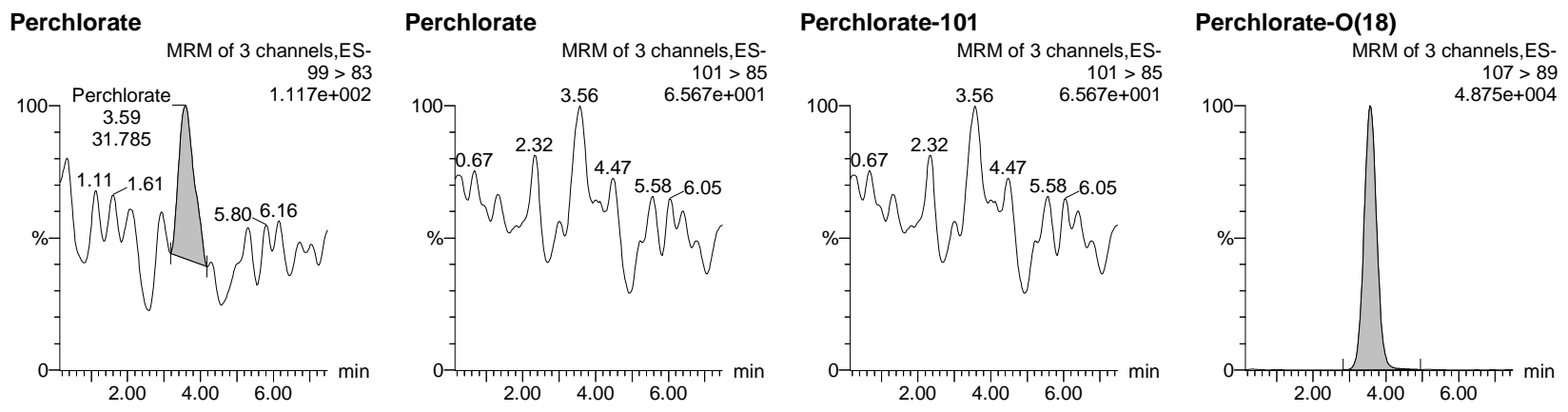
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB002	Perchlorate	99 > 83	3.59	50.759	0.001	bb			0.0011			6.393 0.00
IPB002	Perchlorate-101	101 > 85										
IPB002	Perchlorate-O(18)	107 > 89	3.56	20176.400	20176.400	bb			0.5054	101.08	1.08	3506.0...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314011a
Date: 14-Mar-2017
Time: 16:07:10
ID: IPB003
Vial: 1:1,A



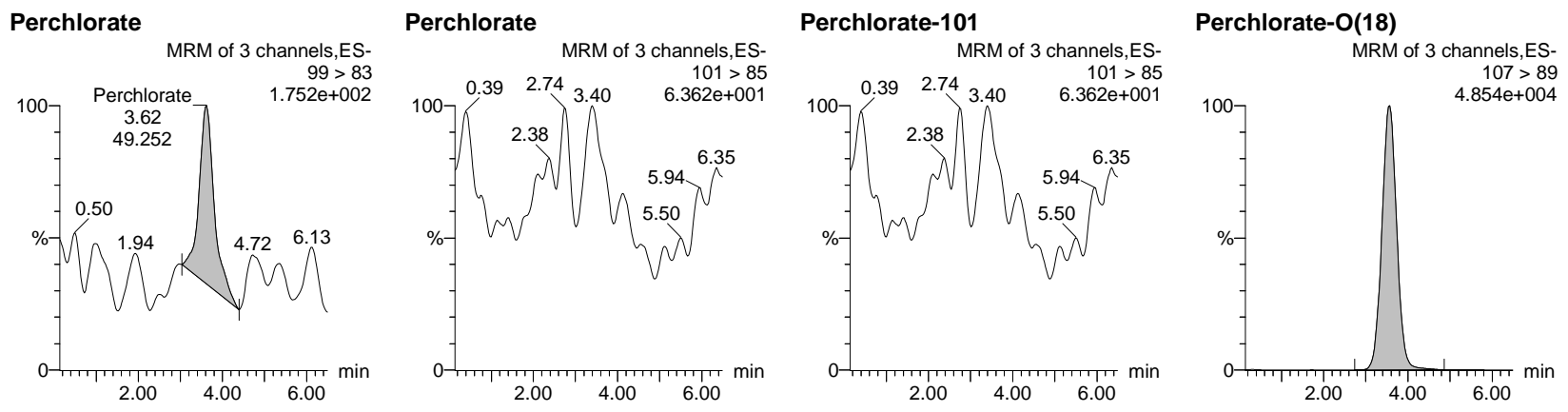
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	3.59	31.785	0.001	bb			0.0007			7.608 0.00
IPB003	Perchlorate-101	101 > 85										
IPB003	Perchlorate-O(18)	107 > 89	3.56	19598.750	19598.750	bb			0.4909	98.19	-1.81	3883.6...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314019a
Date: 14-Mar-2017
Time: 17:27:33
ID: IPB004
Vial: 1:1,A



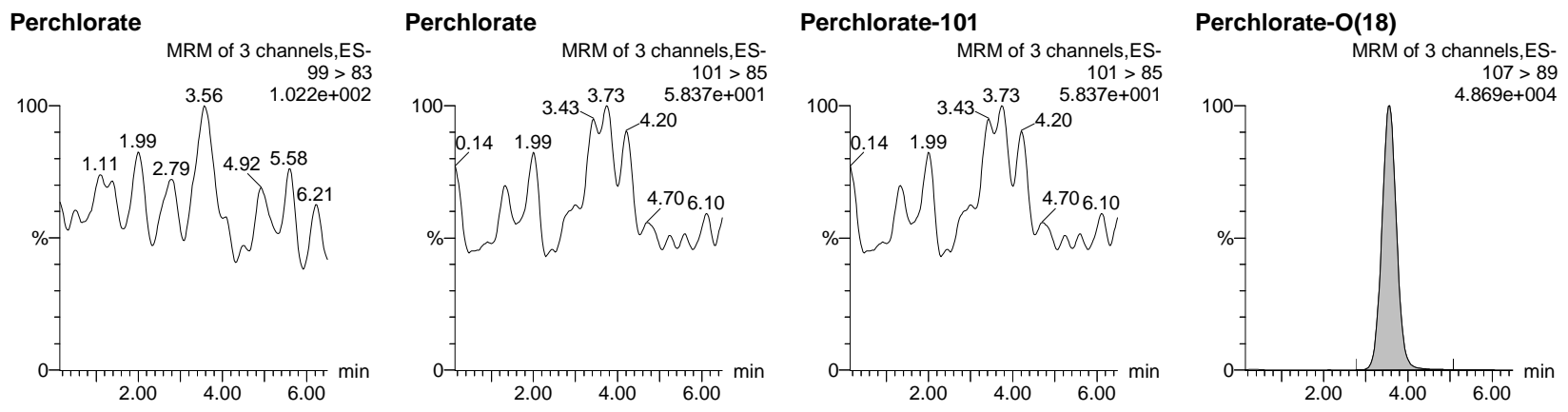
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB004	Perchlorate	99 > 83	3.62	49.252	0.001	bb			0.0011			10.116 0.00
IPB004	Perchlorate-101	101 > 85										
IPB004	Perchlorate-O(18)	107 > 89	3.56	19493.729	19493.729	bb			0.4883	97.66	-2.34	2413.2...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Cww

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314021a
Date: 14-Mar-2017
Time: 17:46:31
ID: IPB005
Vial: 1:1,A



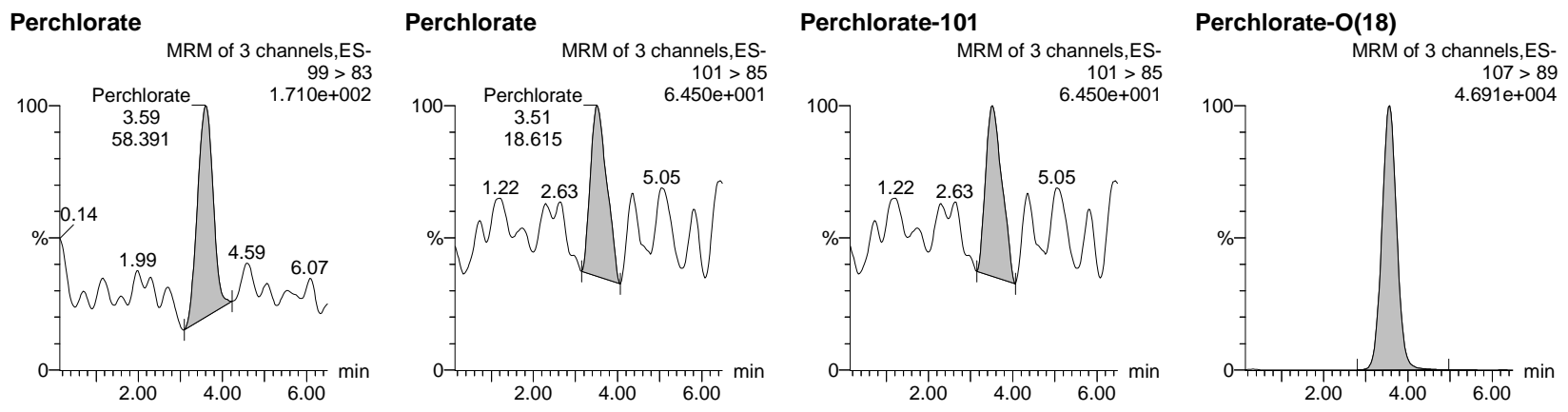
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB005	Perchlorate	99 > 83										0.00
IPB005	Perchlorate-101	101 > 85										
IPB005	Perchlorate-O(18)	107 > 89	3.56	19433.260	19433.260	bb			0.4868	97.36	-2.64	2263.7...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314024a
 Date: 14-Mar-2017
 Time: 18:14:55
 ID: IPB006
 Vial: 1:1,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB006	Perchlorate	99 > 83	3.59	58.391	0.002	bb			0.0014			6.619 3.14
IPB006	Perchlorate-101	101 > 85	3.51	18.615	0.000	bb			0.0013			6.328
IPB006	Perchlorate-O(18)	107 > 89	3.56	18916.057	18916.057	bb			0.4738	94.77	-5.23	3264.3...

Miscellaneous

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1647140 **Verified by:** _____
Analyst: Grace Cappelmann
Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203746613 MB	14-MAR-2017 12:30:00	10	10	1
1203746614 LCS	14-MAR-2017 12:30:00	10	10	1
1203746617 ICS	14-MAR-2017 12:30:00	10	10	1
418450001	14-MAR-2017 12:30:00	10	10	1
1203746615 MS (418450001)	14-MAR-2017 12:30:00	10	10	1
1203746616 MSD (418450001)	14-MAR-2017 12:30:00	10	10	1
418454001	14-MAR-2017 12:30:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203746617	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161104-2.5-Ba/Ag/H
LCS	1203746614	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203746615	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203746616	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE 1 Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Cww

03/15/2017

Date: 03/14/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per031417a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/14/17

Standard-Samp Reagent Lot#:: 2457559

Alt Check Std. ID: WCL170306-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0314001a	IPB001	GXC1	3/14/2017 14:22			1		USE	B
per0314002a	IPB001	GXC1	3/14/2017 14:33			1		USE	B
per0314003a	WCLICAL-01	GXC1	3/14/2017 14:43			1		USE	I
per0314004a	WCLICAL-02	GXC1	3/14/2017 14:54			1		USE	I
per0314005a	WCLICAL-03	GXC1	3/14/2017 15:04			1		USE	I
per0314006a	WCLICAL-04	GXC1	3/14/2017 15:14			1		USE	I
per0314007a	WCLICAL-05	GXC1	3/14/2017 15:25			1		USE	I
per0314008a	WCLICAL-06	GXC1	3/14/2017 15:35			1		USE	I
per0314009a	IPB002	GXC1	3/14/2017 15:46			1		USE	B
per0314010a	WCLICV	GXC1	3/14/2017 15:56			1		USE	C
per0314011a	IPB003	GXC1	3/14/2017 16:07			1		USE	B
per0314012a	WCLCRI	GXC1	3/14/2017 16:17			1		USE	C
per0314013a	1203746613	GXC1	3/14/2017 16:30	1647141	Various	1	MBAC	USE	S
per0314014a	1203746614	GXC1	3/14/2017 16:40	1647141	Various	1	MBAC	USE	S
per0314015a	1203746617	GXC1	3/14/2017 16:49	1647141	Various	1	MBAC	USE	S
per0314016a	418450001	GXC1	3/14/2017 16:59	1647141	418450	20	MBAC	USE	S
per0314017a	1203746615	GXC1	3/14/2017 17:08	1647141	418450	20	MBAC	USE	S
per0314018a	1203746616	GXC1	3/14/2017 17:18	1647141	418450	20	MBAC	USE	S
per0314019a	IPB004	GXC1	3/14/2017 17:27			1		USE	B
per0314020a	418454001	GXC1	3/14/2017 17:37	1647141	418454	100	MBAC	USE	S
per0314021a	IPB005	GXC1	3/14/2017 17:46			1		USE	B
per0314022a	1203745944	GXC1	3/14/2017 17:55	1646832	418382	1	MBAC	USE	S
per0314023a	WCLCCV	GXC1	3/14/2017 18:05			1		USE	C
per0314024a	IPB006	GXC1	3/14/2017 18:14			1		USE	B
per0314025a	WCLCRI	GXC1	3/14/2017 18:24			1		USE	C
per0314026a	1203745945	GXC1	3/14/2017 18:33	1646832	418382	1	MBAC	USE	S
per0314027a	1203745948	GXC1	3/14/2017 18:43	1646832	418382	1	MBAC	USE	S
per0314028a	418382001	GXC1	3/14/2017 18:52	1646832	418382	1	MBAC	USE	S
per0314029a	418382002	GXC1	3/14/2017 19:02	1646832	418382	1	MBAC	USE	S

per0314030a	418382003	GXC1	3/14/2017 19:11	1646832	418382	1	MBAC	USE	S
per0314031a	1203745946	GXC1	3/14/2017 19:21	1646832	418382	1	MBAC	USE	S
per0314032a	1203745947	GXC1	3/14/2017 19:30	1646832	418382	1	MBAC	USE	S
per0314033a	418382004	GXC1	3/14/2017 19:40	1646832	418382	1	MBAC	USE	S
per0314034a	418382005	GXC1	3/14/2017 19:49	1646832	418382	1	MBAC	USE	S
per0314035a	418382006	GXC1	3/14/2017 19:59	1646832	418382	1	MBAC	USE	S
per0314036a	WCLCCV	GXC1	3/14/2017 20:08			1		USE	C
per0314037a	IPB007	GXC1	3/14/2017 20:17			1		USE	B
per0314038a	WCLCRI	GXC1	3/14/2017 20:27			1		USE	C
per0314039a	418382007	GXC1	3/14/2017 20:36	1646832	418382	1	MBAC	USE	S
per0314040a	WCLCCV	GXC1	3/14/2017 20:46			1		USE	C
per0314041a	IPB008	GXC1	3/14/2017 20:55			1		USE	B
per0314042a	WCLCRI	GXC1	3/14/2017 21:05			1		USE	C

DATA EXCEPTION REPORT			
Mo.Day Yr. 15-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1647141	Sample Numbers: See below		
Potentially affected work order(s)(SDG): 418450,418454			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
<p>1. In 1203746615 (MS) a high recovery for Perchlorate was observed. The recovery was 296% and the acceptance range is 75-125%. In 1203746616 (MSD) a 0% recovery was observed. The detected concentration in the MSD was lower than that detected in the parent sample.</p>		<p>1. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418450001 (LH18/24-SP650-6423-Grab) and the need to dilute all at a 1:20 dilution prior to analysis. Will report data and note in case narrative.</p>	

Originator's Name:

Grace Cappelmann 15-MAR-17

Data Validator/Group Leader:

Charles Wilson 15-MAR-17

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



March 23, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 418454

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 14, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

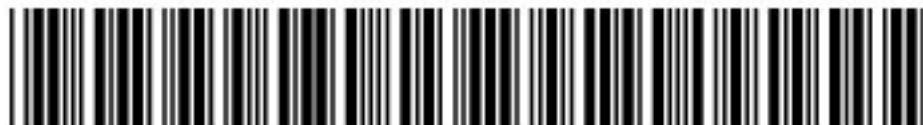


Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	43
Miscellaneous.....	63

Case Narrative

**Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 418454**

March 23, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 14, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

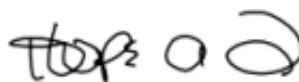
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
418454001	LH18/24-SP140-7423-Grab

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.



Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

418454

CHAIN OF CUSTODY

Name Of Lab Shipping To: GEL Laboratories (843) 556 - 8171 ATTN: HOPE TAYLOR

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No. 60256135.GWTPT HRUMAR16	
Job: GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES			
Prepared By: Scott Beesinger		P.O. Number	
Field Sample I.D. LH18/24-SP140-7423-Grab	Sample Matrix Water	Date / Time 03/13/17 / 15:00	MS / MSD 1
NO. OF CONTAINERS 1		ANALYSES PERCHLORATE	
Remarks (Preservatives, etc.) NONE		Lab I.D.#	
Additional Remarks: <u>STANDARD TURN AROUND TIME</u>			
Relinquished By: <i>[Signature]</i>	Date 03/13/17	Time 15:30	Received By: <i>[Signature]</i>
	Date 3/14/17	Time 0940	Relinquished By:

For Lab Use Only			
Received At Lab By:	Date	Time	Alrbill No.
Received By:	Date	Time	Seal No.
Temp of Container	Condition	Remarks:	



SAMPLE RECEIPT & REVIEW FORM

Client: <u>MBAC</u>		SDG/AR/COC/Work Order: <u>418450 / 418454</u>	
Received By: <u>AG</u>		Date Received: <u>3/14/17</u>	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other	
		<u>J461 688 383 5</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>122-17</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input type="checkbox"/>			If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>			
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AG Date 3/14/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 23 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
Microbac Laboratories, Inc Kentucky Division (MBAC)
SDG #: 418454**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1647141

Prep Batch Number: 1647140

Sample Analysis

Sample ID	Client ID
418454001	418454001 (LH18/24-SP140-7423-Grab)
1203746617	Interference Check Sample (ICS)
1203746613	Method Blank (MB)
1203746614	Laboratory Control Sample (LCS)
1203746615	418450001(LH18/24-SP650-6423-Grab) Matrix Spike (MS)
1203746616	418450001(LH18/24-SP650-6423-Grab) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418450001 (LH18/24-SP650-6423-Grab) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203746615 (MS) a high recovery for Perchlorate was observed. The recovery was 296% and the acceptance range is 75-125%. In 1203746616 (MSD) a 0% recovery was observed. The detected concentration in the MSD was lower than that detected in the parent sample. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418450001 (LH18/24-SP650-6423-Grab) and the need to dilute all at a 1:20 dilution prior to analysis. 1203746615 (LH18/24-SP650-6423-GrabMS) and 1203746616 (LH18/24-SP650-6423-GrabMSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203746615 (LH18/24-SP650-6423-GrabMS), 1203746616 (LH18/24-SP650-6423-GrabMSD) and 418454001 (LH18/24-SP140-7423-Grab) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1613708 was generated for samples 1203746615 (LH18/24-SP650-6423-GrabMS) and 1203746616 (LH18/24-SP650-6423-GrabMSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 418454 GEL Work Order: 418454

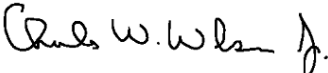
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 15 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP140-7423-Grab

Date Received: 14-MAR-17

GEL Job No (SDG): 418454

GEL Sample ID: 418454001

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	5	20	115	ug/L		100	14-MAR-17 17:37	per0314020a
	Perchlorate-O(18)			49.6	ug/L		100	14-MAR-17 17:37	per0314020a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 418454

Extract Batch Code: 1647140

Date Filtered: 14-MAR-17

Matrix: WATER

Sample ID: 1203746614

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.192	ug/L	96		85 - 115
Perchlorate-O(18)		.494	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 418454Extract Batch Code: 1647140Date Filtered: 14-MAR-17Matrix: WATERSample ID: 1203746617

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		70 - 130
Perchlorate-O(18)		.521	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 418454Extract Batch Code: 1647140Date Extracted: 14-MAR-17GEL MS/PS ID: 1203746615Client ID: LH18/24-SP650-6423-GrabGEL MSD/PSD ID: 1203746616QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	30.1	ug/L	30.6	296 *	27.5	0 *	11	30	75 - 125
Perchlorate-O(18)	0	9.84	ug/L	10.0		10.1		1		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0314006a	14-MAR-17	20443.8				
Lower Area Limit			10221.9				
Upper Area Limit			30665.7				
1203746613	per0314013a	14-MAR-17 16:30	19571.7	3.56	3.61968	1.017	
1203746614	per0314014a	14-MAR-17 16:40	19711.6	3.56	3.59217	1.009	
1203746617	per0314015a	14-MAR-17 16:49	20813.9	3.4	3.42667	1.008	
1203746615	per0314017a	14-MAR-17 17:08	20018.9	3.56	3.59217	1.009	
1203746616	per0314018a	14-MAR-17 17:18	20142	3.56	3.59217	1.009	
418454001	per0314020a	14-MAR-17 17:37	19816.6	3.56	3.59217	1.009	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP140-7423-Grab

Date Received: 14-MAR-17

GEL Job No (SDG): 418454

GEL Sample ID: 418454001

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	5	20	115	ug/L		100	14-MAR-17 17:37	per0314020a
	Perchlorate-O(18)			49.6	ug/L		100	14-MAR-17 17:37	per0314020a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

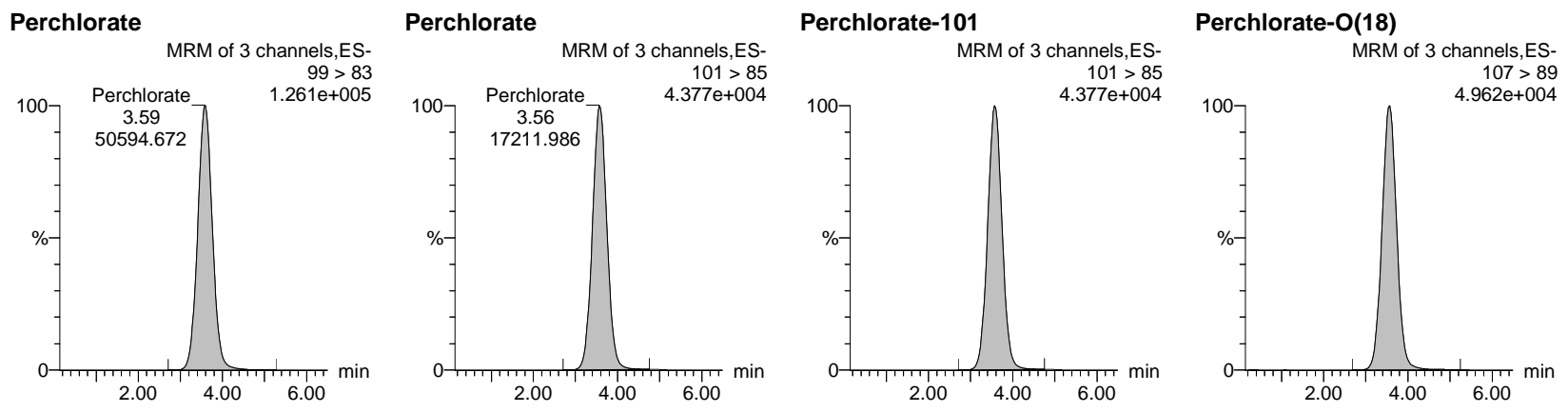
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Cww

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314020a
Date: 14-Mar-2017
Time: 17:37:01
ID: 418454001
Vial: 1:4,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
418454001	Perchlorate	99 > 83	3.59	50594.672	1.277	bb			1.1546			10628.... 2.94
418454001	Perchlorate-101	101 > 85	3.56	17211.986	0.434	bb			1.1816			3723.0...
418454001	Perchlorate-O(18)	107 > 89	3.56	19816.602	19816.602	bb			0.4964	99.28	-0.72	2101.8...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 14-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname

Perchlorate

Coefficient of Determination:

Calibration Curve:

1.105

Response Type:

Internal Standard

Curve Type:

RF

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 14-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .36667Response Type: Internal StandardCurve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld

Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time

Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031417a.mdb 15 Mar 2017 08:56:13

Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031417a.cdb 15 Mar 2017 08:56:55

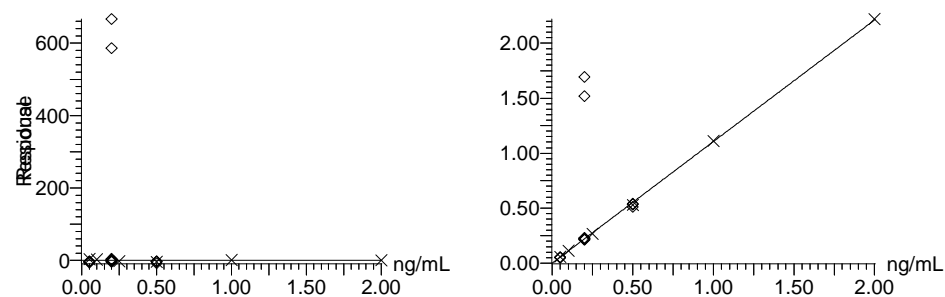
Compound name: Perchlorate

Response Factor: 1.10564

RRF SD: 0.0317675, % Relative SD: 2.87321

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



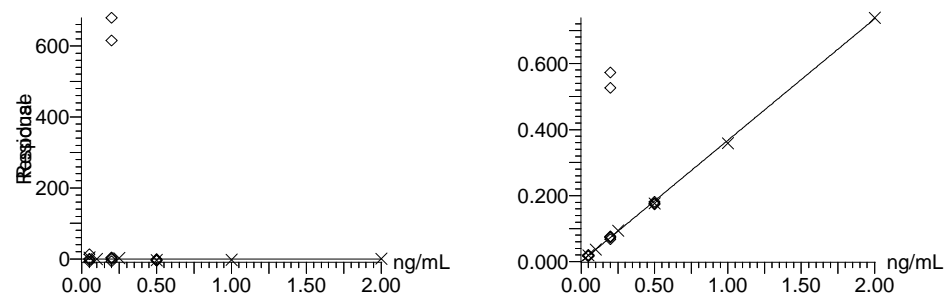
Compound name: Perchlorate-101

Response Factor: 0.367544

RRF SD: 0.0100258, % Relative SD: 2.72778

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld

Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time

Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

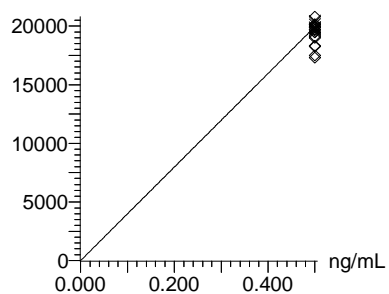
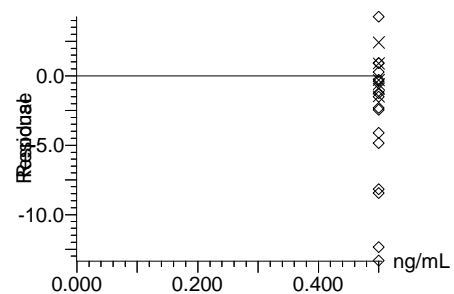
Compound name: Perchlorate-O(18)

Response Factor: 39920.8

RRF SD: 568.938, % Relative SD: 1.42517

Response type: External Std, Area

Curve type: RF



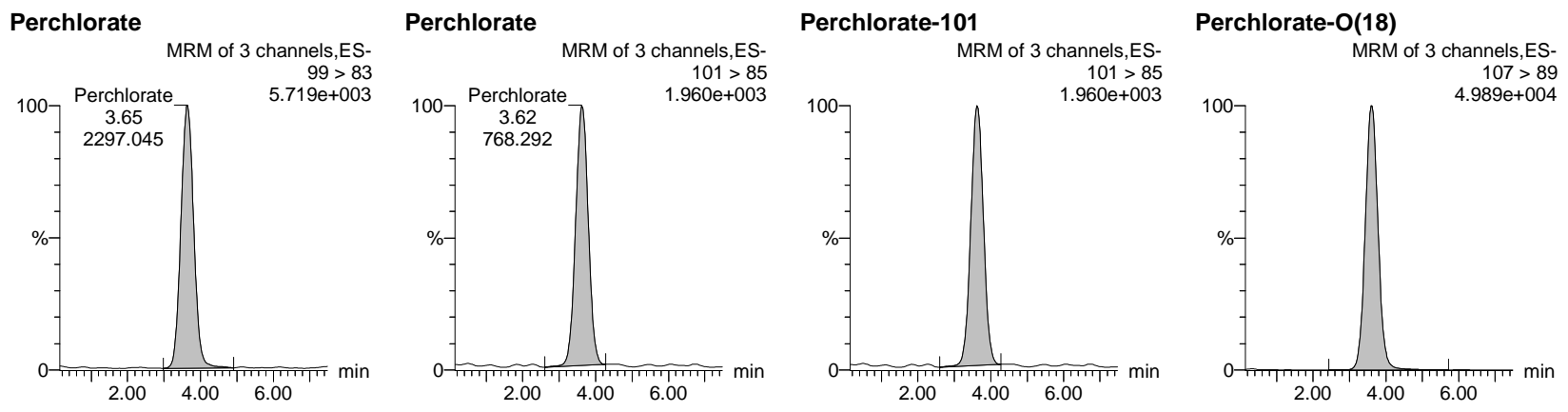
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314003a
Date: 14-Mar-2017
Time: 14:43:37
ID: WCL170306-01
Vial: 1:1,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-01	Perchlorate	99 > 83	3.65	2297.045	0.057	bb			0.0516	103.17	3.17	391.685	2.99
WCL170306-01	Perchlorate-101	101 > 85	3.62	768.292	0.019	bb			0.0519	103.80	3.80	179.220	
WCL170306-01	Perchlorate-O(18)	107 > 89	3.59	20137.695	20137.695	bb			0.5044	100.89	0.89	2927.9...	

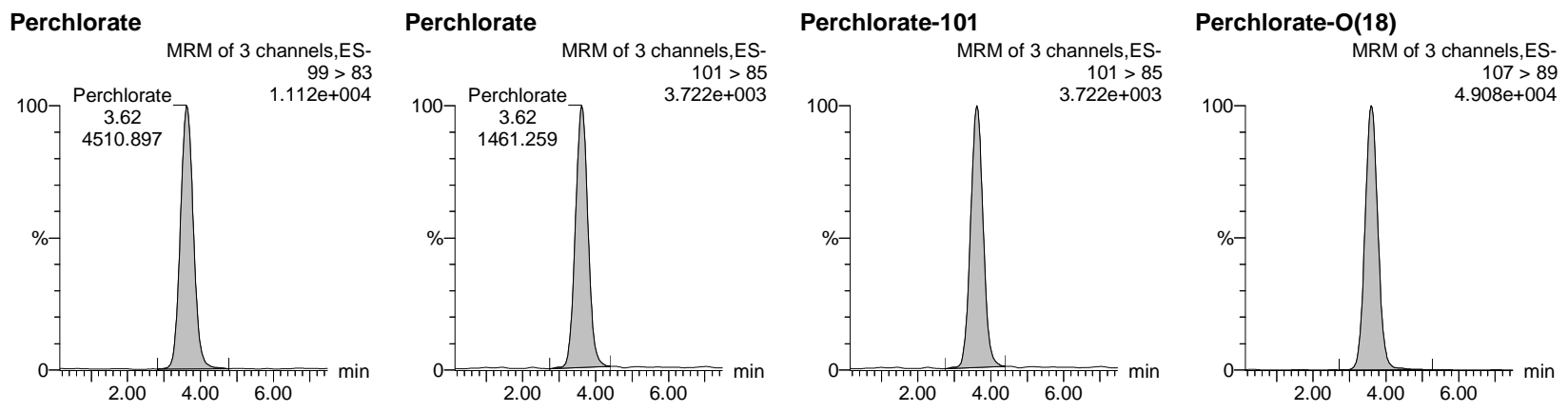
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314004a
Date: 14-Mar-2017
Time: 14:54:04
ID: WCL170306-02
Vial: 1:1,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-02	Perchlorate	99 > 83	3.62	4510.897	0.113	bb			0.1025	102.51	2.51	314.128	3.09
WCL170306-02	Perchlorate-101	101 > 85	3.62	1461.259	0.037	bb			0.0999	99.89	-0.11	444.297	
WCL170306-02	Perchlorate-O(18)	107 > 89	3.59	19899.643	19899.643	bb			0.4985	99.70	-0.30	3206.7...	

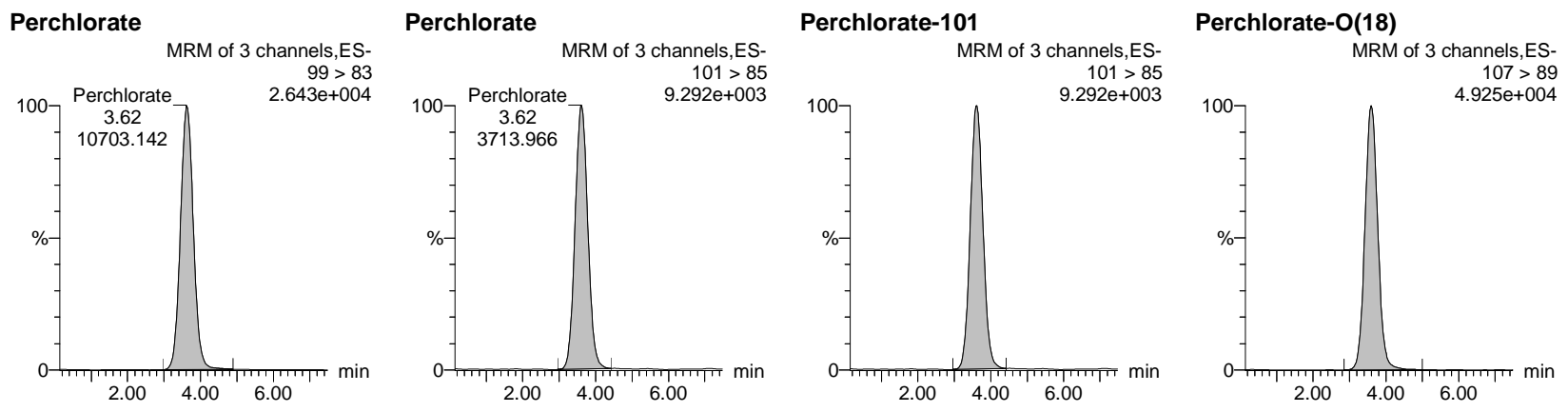
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314005a
Date: 14-Mar-2017
Time: 15:04:31
ID: WCL170306-03
Vial: 1:1,D



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-03	Perchlorate	99 > 83	3.62	10703.142	0.270	bb			0.2440	97.58	-2.42	1457.3...	2.88
WCL170306-03	Perchlorate-101	101 > 85	3.62	3713.966	0.094	bb			0.2547	101.86	1.86	1029.1...	
WCL170306-03	Perchlorate-O(18)	107 > 89	3.59	19840.367	19840.367	bb			0.4970	99.40	-0.60	2276.3...	

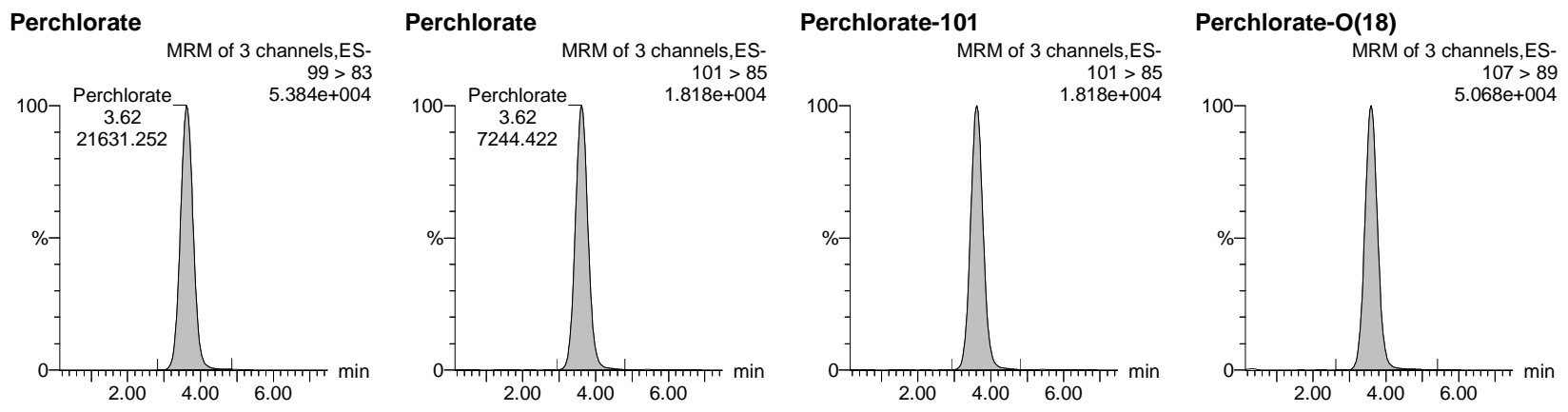
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314006a
Date: 14-Mar-2017
Time: 15:14:56
ID: WCL170306-04
Vial: 1:1,E

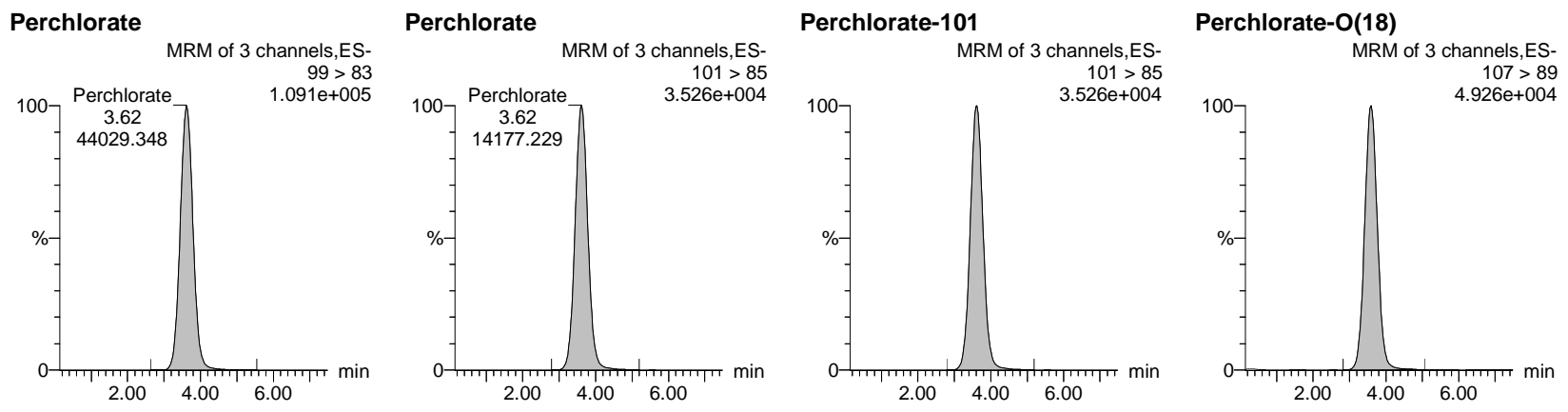


ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-04	Perchlorate	99 > 83	3.62	21631.252	0.529	bb			0.4785	95.70	-4.30	8795.9...	2.99
WCL170306-04	Perchlorate-101	101 > 85	3.62	7244.422	0.177	bb			0.4821	96.41	-3.59	2986.7...	
WCL170306-04	Perchlorate-O(18)	107 > 89	3.59	20443.789	20443.789	bb			0.5121	102.42	2.42	3387.3...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314007a
 Date: 14-Mar-2017
 Time: 15:25:22
 ID: WCL170306-05
 Vial: 1:1,F



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-05	Perchlorate	99 > 83	3.62	44029.348	1.113	bb			1.0068	100.68	0.68	1856.0...	3.11
WCL170306-05	Perchlorate-101	101 > 85	3.62	14177.229	0.358	bb			0.9752	97.52	-2.48	7225.7...	
WCL170306-05	Perchlorate-O(18)	107 > 89	3.59	19776.561	19776.561	bb			0.4954	99.08	-0.92	1895.7...	

CWW

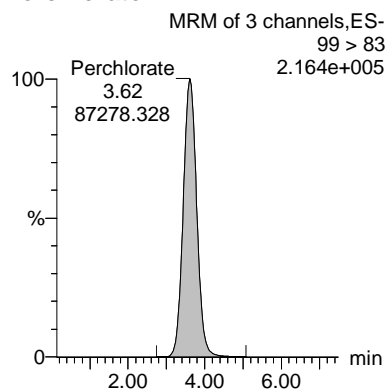
03/15/2017

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

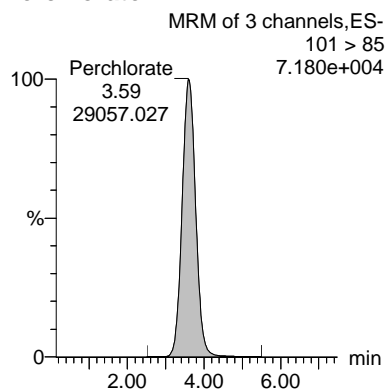
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314008a
Date: 14-Mar-2017
Time: 15:35:48
ID: WCL170306-06
Vial: 1:2,A

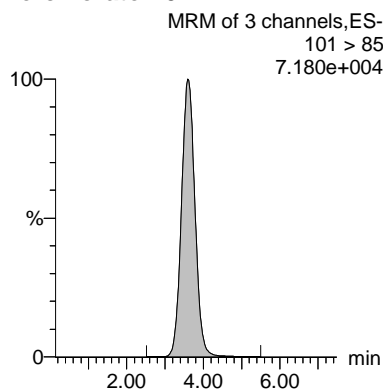
Perchlorate



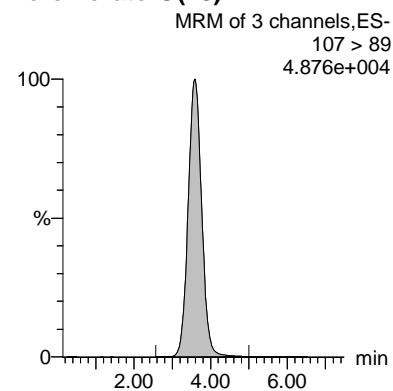
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-06	Perchlorate	99 > 83	3.62	87278.328	2.219	bb			2.0072	100.36	0.36	12668....	3.00
WCL170306-06	Perchlorate-101	101 > 85	3.59	29057.027	0.739	bb			2.0102	100.51	0.51	4395.4...	
WCL170306-06	Perchlorate-O(18)	107 > 89	3.59	19664.396	19664.396	bb			0.4926	98.52	-1.48	4608.7...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELReporting Units: ug/L

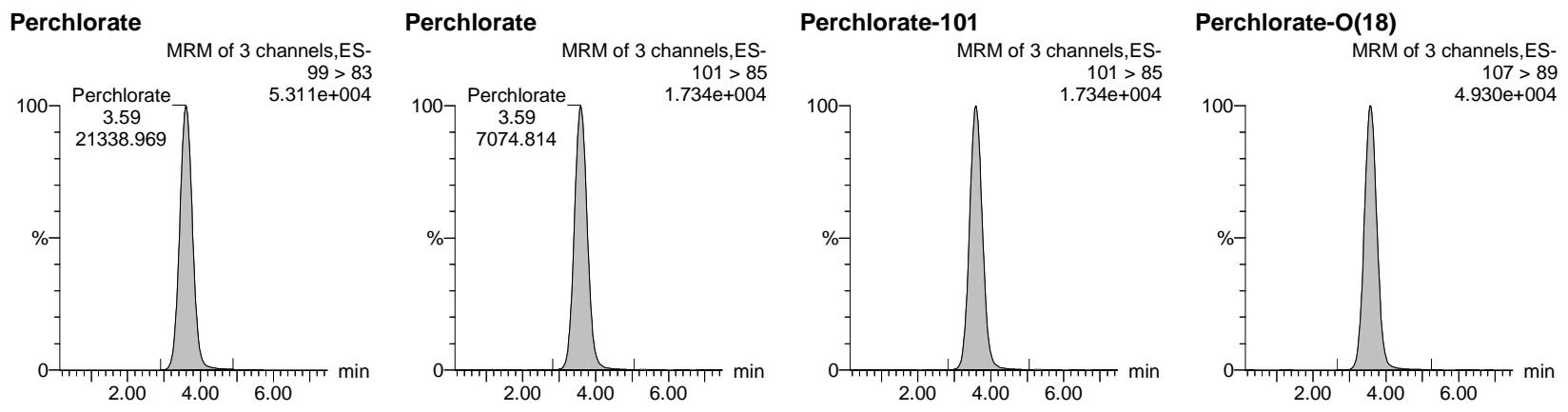
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.07	14-MAR-17 15:56	per0314010a
Perchlorate Isotope Ratio		3.02		14-MAR-17 15:56	per0314010a
Perchlorate-101	.5	.48	96.81	14-MAR-17 15:56	per0314010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314010a
Date: 14-Mar-2017
Time: 15:56:42
ID: WCL170306-07ICV
Vial: 1:2,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07ICV	Perchlorate	99 > 83	3.59	21338.969	0.537	bb			0.4853	97.07	-2.93	1982.6...	3.02
WCL170306-07ICV	Perchlorate-101	101 > 85	3.59	7074.814	0.178	bb			0.4840	96.81	-3.19	2558.1...	
WCL170306-07ICV	Perchlorate-O(18)	107 > 89	3.56	19883.162	19883.162	bb			0.4981	99.61	-0.39	2357.0...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELReporting Units: ug/L

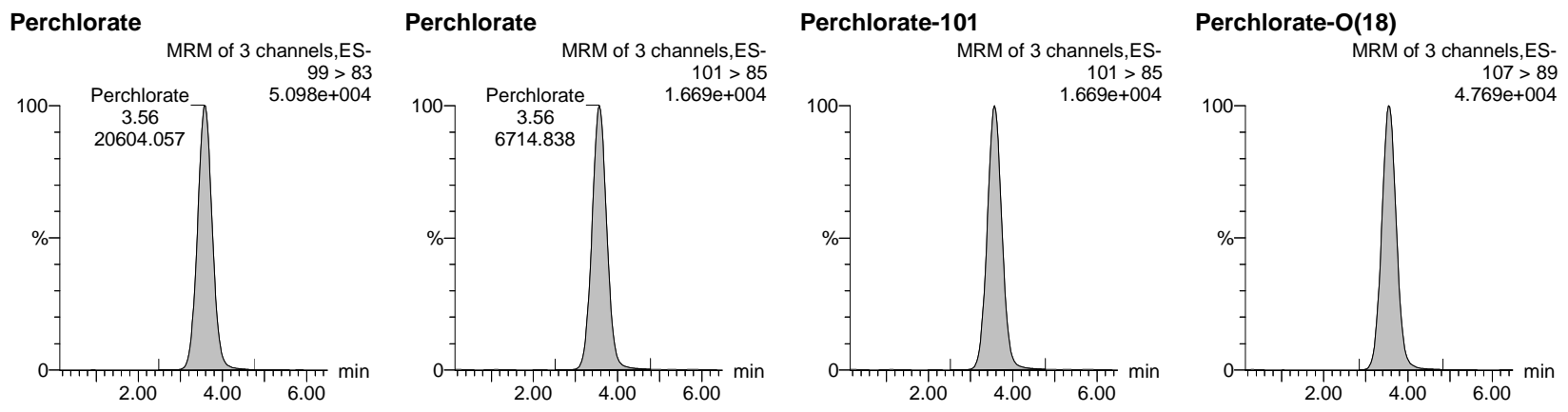
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.36	14-MAR-17 18:05	per0314023a
Perchlorate Isotope Ratio		3.07		14-MAR-17 18:05	per0314023a
Perchlorate-101	.5	.48	95.45	14-MAR-17 18:05	per0314023a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314023a
Date: 14-Mar-2017
Time: 18:05:28
ID: WCL170306-07CCV
Vial: 1:2,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07CCV	Perchlorate	99 > 83	3.56	20604.057	0.538	bb			0.4868	97.36	-2.64	2165.7...	3.07
WCL170306-07CCV	Perchlorate-101	101 > 85	3.56	6714.838	0.175	bb			0.4773	95.45	-4.55	1096.5...	
WCL170306-07CCV	Perchlorate-O(18)	107 > 89	3.54	19139.893	19139.893	bb			0.4794	95.89	-4.11	1403.6...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELReporting Units: ug/L

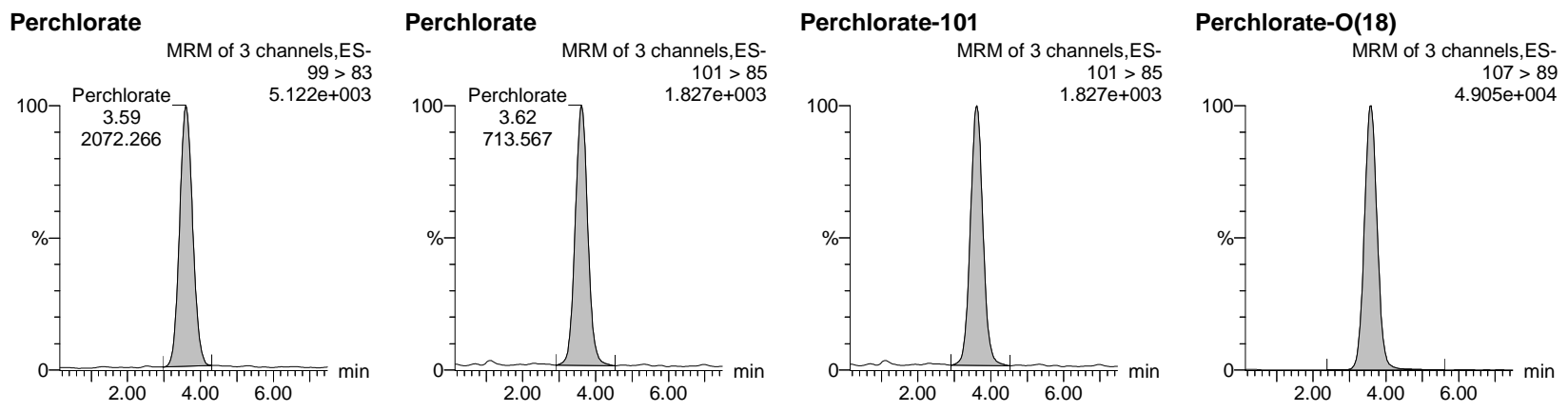
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	94.16	14-MAR-17 16:17	per0314012a
Perchlorate Isotope Ratio		2.9		14-MAR-17 16:17	per0314012a
Perchlorate-101	.05	.05	97.54	14-MAR-17 16:17	per0314012a
Perchlorate	.05	.05	97.21	14-MAR-17 18:24	per0314025a
Perchlorate Isotope Ratio		3.18		14-MAR-17 18:24	per0314025a
Perchlorate-101	.05	.05	91.99	14-MAR-17 18:24	per0314025a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314012a
Date: 14-Mar-2017
Time: 16:17:37
ID: WCL170306-08CRI
Vial: 1:2,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.59	2072.266	0.052	bb			0.0471	94.16	-5.84	241.525	2.90
WCL170306-08CRI	Perchlorate-101	101 > 85	3.62	713.567	0.018	bb			0.0488	97.54	-2.46	273.714	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.59	19904.623	19904.623	bb			0.4986	99.72	-0.28	3531.2...	

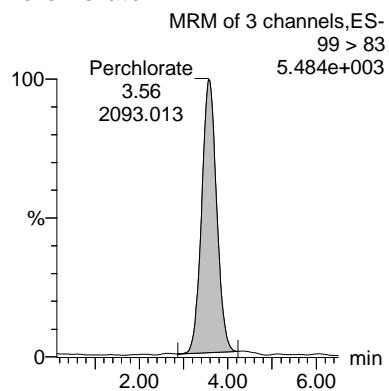
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

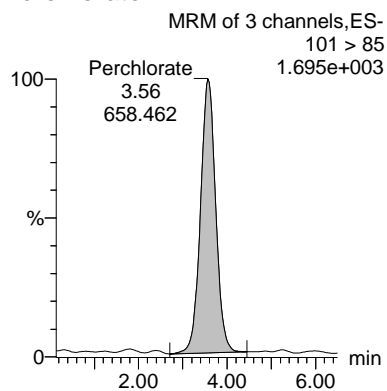
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314025a
Date: 14-Mar-2017
Time: 18:24:22
ID: WCL170306-08CRI
Vial: 1:2,C

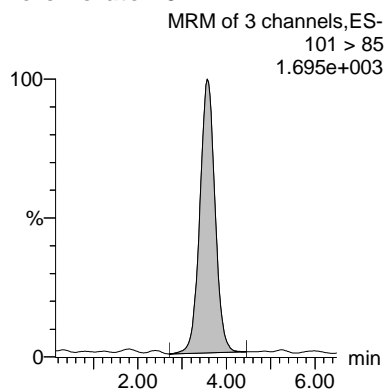
Perchlorate



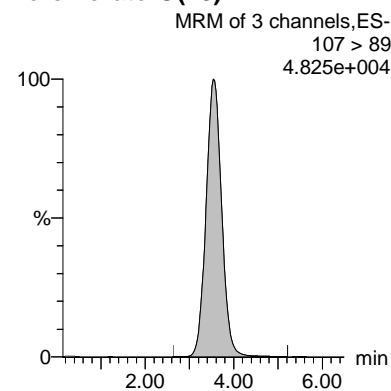
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.56	2093.013	0.054	bb			0.0486	97.21	-2.79	305.881	3.18
WCL170306-08CRI	Perchlorate-101	101 > 85	3.56	658.462	0.017	bb			0.0460	91.99	-8.01	165.819	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.54	19474.150	19474.150	bb			0.4878	97.56	-2.44	3359.8...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

MB

Date Received: 14-MAR-17

GEL Job No (SDG): 418454

GEL Sample ID: 1203746613

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	14-MAR-17 16:30	per0314013a
	Perchlorate-O(18)			0.490	ug/L		1	14-MAR-17 16:30	per0314013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

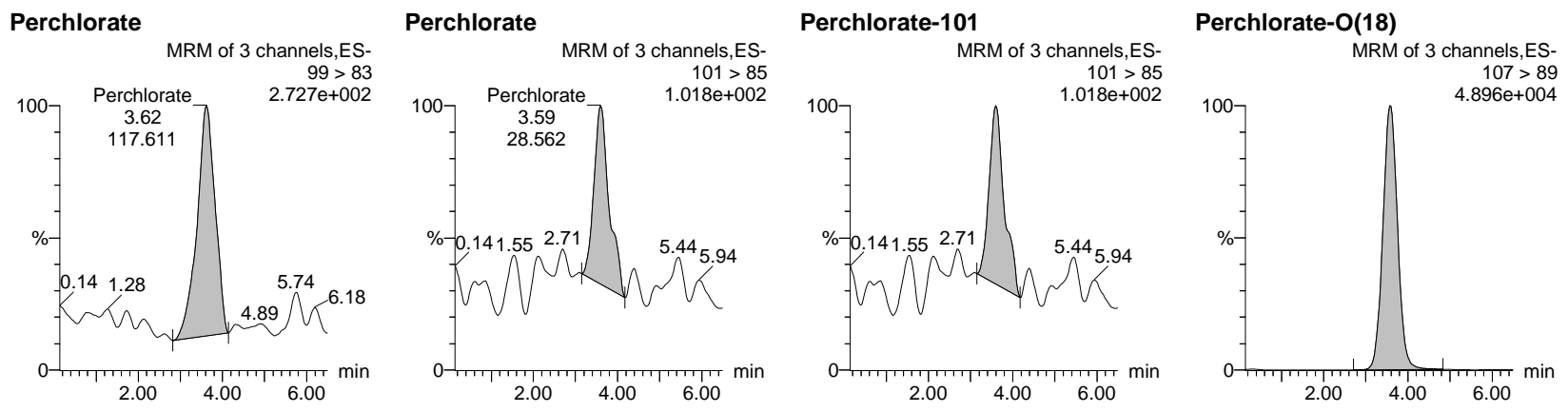
$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314013a
Date: 14-Mar-2017
Time: 16:30:48
ID: 1203746613
Vial: 1:3,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746613	Perchlorate	99 > 83	3.62	117.611	0.003	bb			0.0027			27.862	4.12
1203746613	Perchlorate-101	101 > 85	3.59	28.562	0.001	bb			0.0020			9.327	
1203746613	Perchlorate-O(18)	107 > 89	3.56	19571.738	19571.738	bb			0.4903	98.05	-1.95	2532.8...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 14-MAR-17

GEL Job No (SDG): 418454

GEL Sample ID: 1203746614

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.192	ug/L	J	1	14-MAR-17 16:40	per0314014a
	Perchlorate-O(18)			0.494	ug/L		1	14-MAR-17 16:40	per0314014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

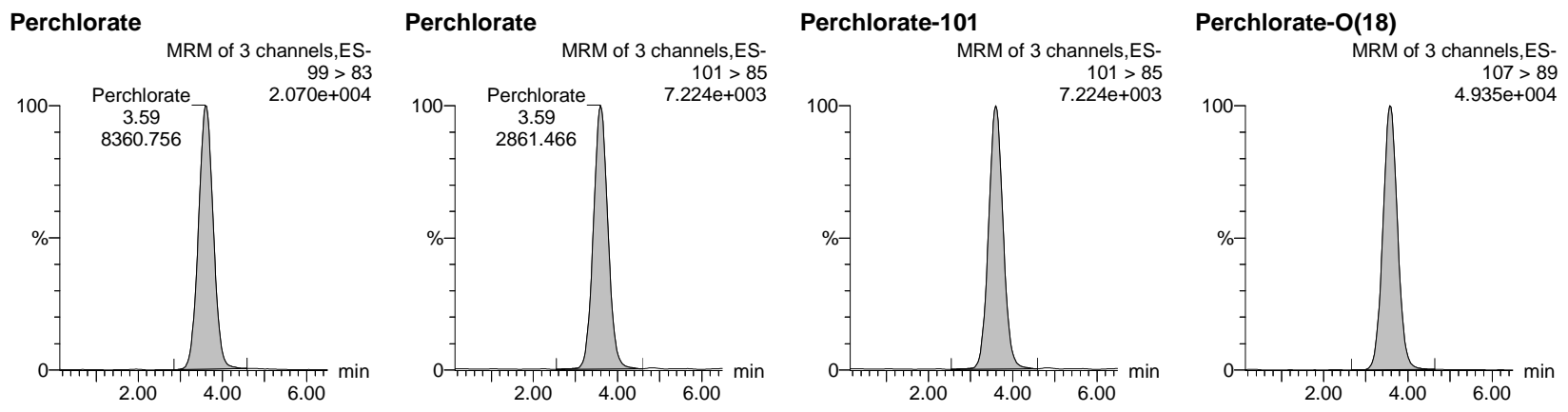
$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314014a
Date: 14-Mar-2017
Time: 16:40:16
ID: 1203746614
Vial: 1:3,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746614	Perchlorate	99 > 83	3.59	8360.756	0.212	bb			0.1918	95.91	-4.09	2027.7...	2.92
1203746614	Perchlorate-101	101 > 85	3.59	2861.466	0.073	bb			0.1975	98.74	-1.26	1008.3...	
1203746614	Perchlorate-O(18)	107 > 89	3.56	19711.578	19711.578	bb			0.4938	98.75	-1.25	2895.5...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 418454

GEL Sample ID: 1203746617

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	14-MAR-17 16:49	per0314015a
	Perchlorate-O(18)			0.521	ug/L		1	14-MAR-17 16:49	per0314015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

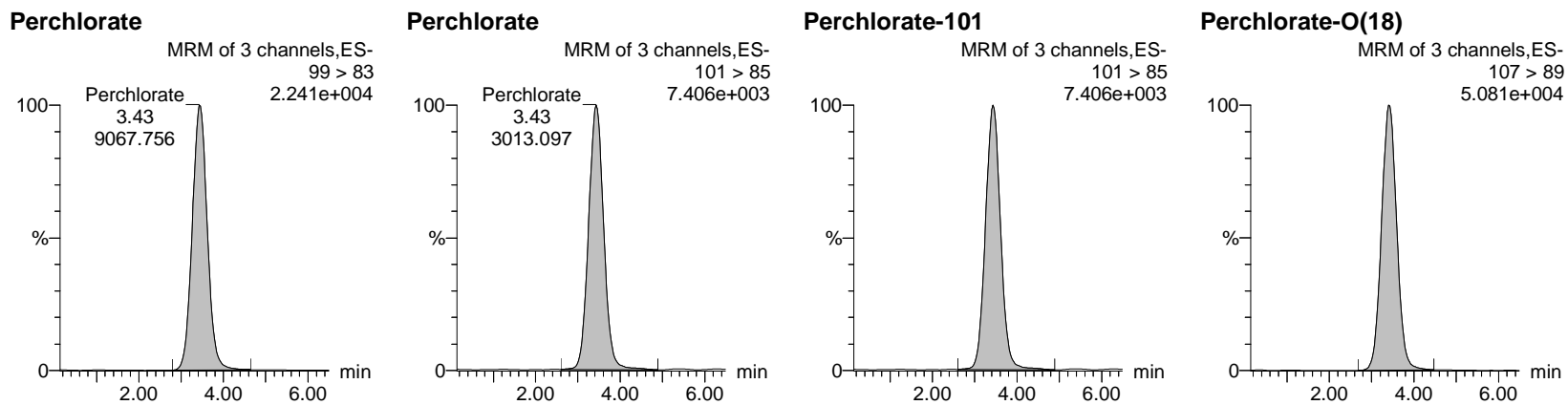
$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314015a
 Date: 14-Mar-2017
 Time: 16:49:44
 ID: 1203746617
 Vial: 1:3,C



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746617	Perchlorate	99 > 83	3.43	9067.756	0.218	bb			0.1970	98.51	-1.49	2008.6...	3.01
1203746617	Perchlorate-101	101 > 85	3.43	3013.097	0.072	bb			0.1969	98.47	-1.53	1410.7...	
1203746617	Perchlorate-O(18)	107 > 89	3.40	20813.867	20813.867	bb			0.5214	104.28	4.28	1307.7...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1647140Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-GrabMSDate Received: 14-MAR-17GEL Job No (SDG): 418454GEL Sample ID: 1203746615Date Filtered: 14-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	30.6	ug/L		20	14-MAR-17 17:08	per0314017a
	Perchlorate-O(18)			10.0	ug/L		20	14-MAR-17 17:08	per0314017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

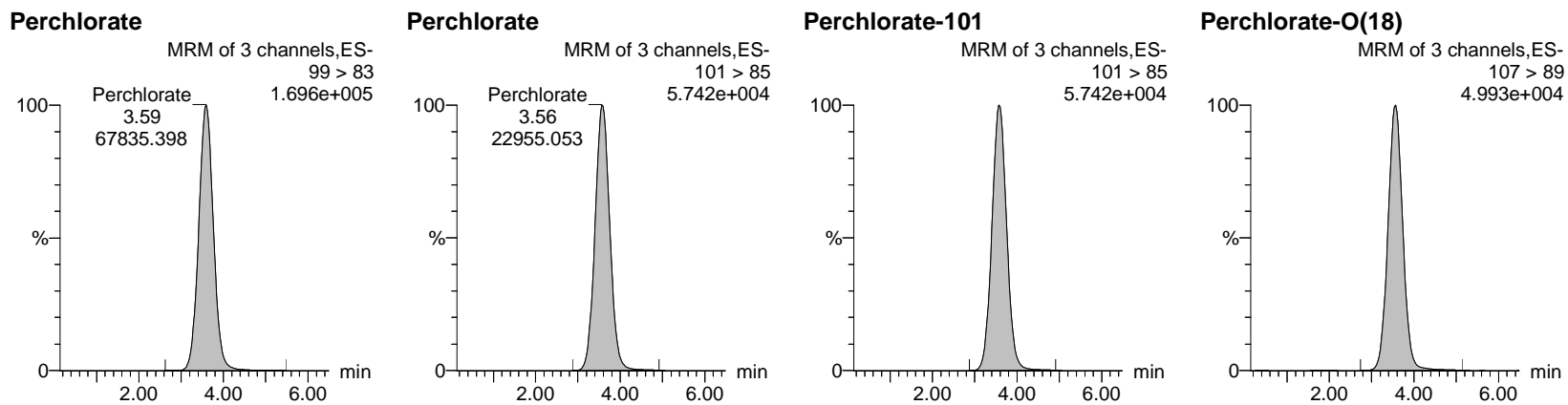
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Cww

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314017a
Date: 14-Mar-2017
Time: 17:08:39
ID: 1203746615
Vial: 1:3,E



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746615	Perchlorate	99 > 83	3.59	67835.398	1.694	bb			1.5324	766.20	666.20	9858.8...	2.96
1203746615	Perchlorate-101	101 > 85	3.56	22955.053	0.573	bb			1.5599	779.95	679.95	4161.6...	
1203746615	Perchlorate-O(18)	107 > 89	3.56	20018.902	20018.902	bb			0.5015	100.29	0.29	2168.9...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1647140

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6423-GrabMSD

Date Received: 14-MAR-17

GEL Job No (SDG): 418454

GEL Sample ID: 1203746616

Date Filtered: 14-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	27.5	ug/L		20	14-MAR-17 17:18	per0314018a
	Perchlorate-O(18)			10.1	ug/L		20	14-MAR-17 17:18	per0314018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

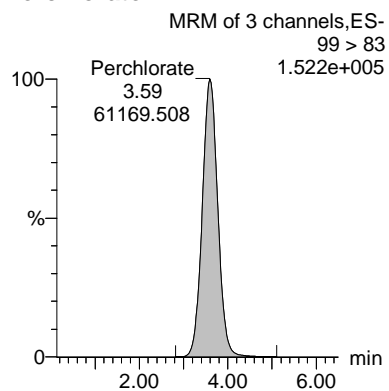
CWW

03/15/2017

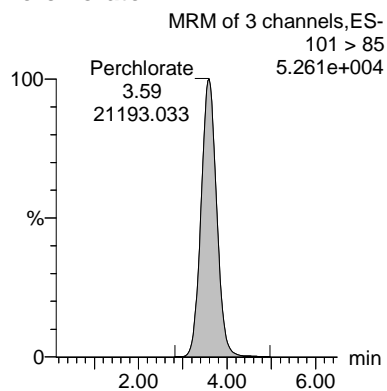
Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314018a
Date: 14-Mar-2017
Time: 17:18:06
ID: 1203746616
Vial: 1:3,F

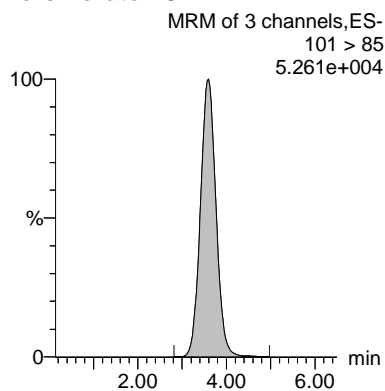
Perchlorate



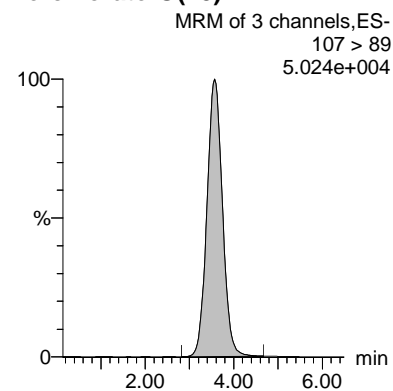
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203746616	Perchlorate	99 > 83	3.59	61169.508	1.518	bb			1.3734	686.69	586.69	5032.5...	2.89
1203746616	Perchlorate-101	101 > 85	3.59	21193.033	0.526	bb			1.4314	715.68	615.68	9892.6...	
1203746616	Perchlorate-O(18)	107 > 89	3.56	20141.959	20141.959	bb			0.5045	100.91	0.91	2081.7...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	14-MAR-17	per0314001a	IPB001
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314001a	IPB001
Perchlorate	0.00	0	NA	14-MAR-17	per0314002a	IPB001
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314002a	IPB001

CWW

03/15/2017

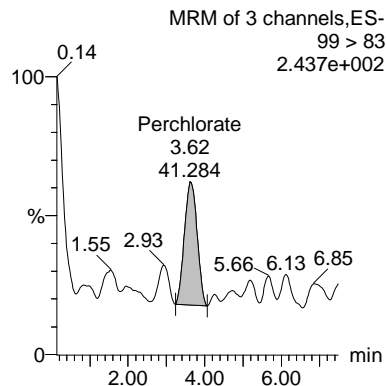
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

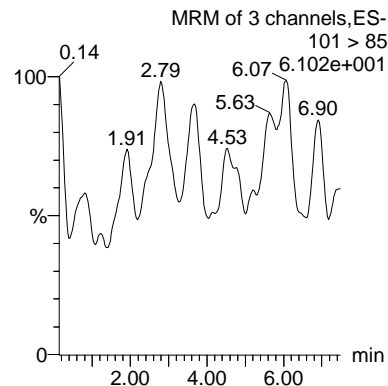
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031417a.mdb 15 Mar 2017 08:56:13
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031417a.cdb 15 Mar 2017 08:56:55

Name: per0314001a
 Date: 14-Mar-2017
 Time: 14:22:39
 ID: IPB001
 Vial: 1:1,A

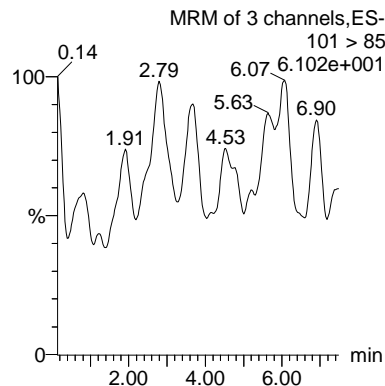
Perchlorate



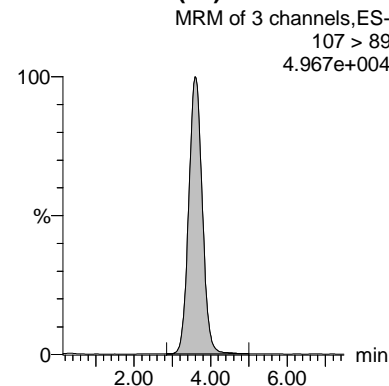
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.62	41.284	0.001	bb			0.0009			6.892 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	3.59	20112.693	20112.693	bb			0.5038	100.76	0.76	4098.1...

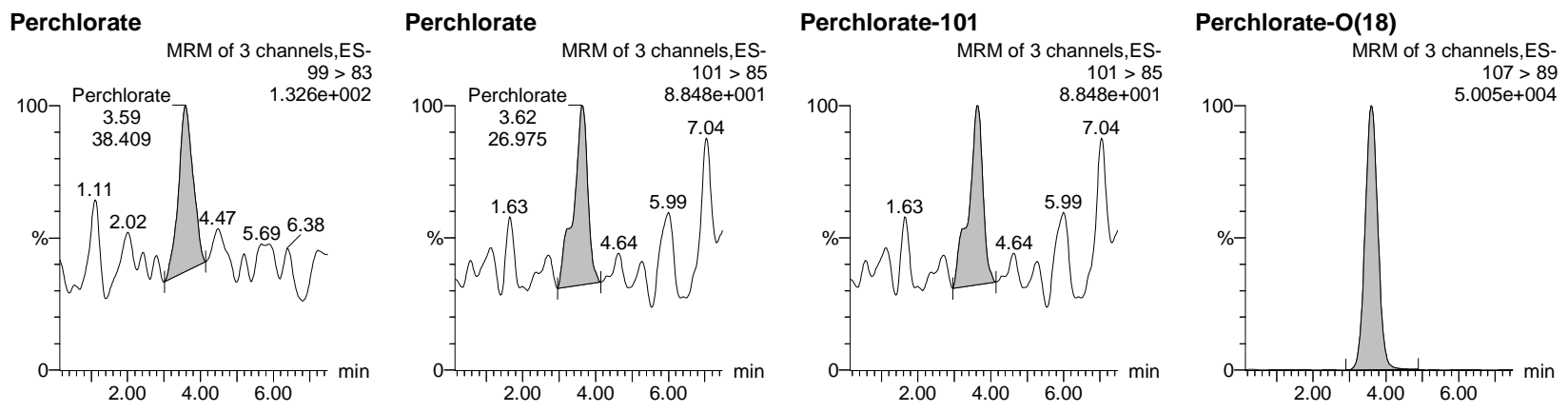
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314002a
Date: 14-Mar-2017
Time: 14:33:10
ID: IPB001
Vial: 1:1,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.59	38.409	0.001	bb			0.0009			7.529 1.42
IPB001	Perchlorate-101	101 > 85	3.62	26.975	0.001	bb			0.0018			7.576
IPB001	Perchlorate-O(18)	107 > 89	3.59	20093.990	20093.990	bb			0.5033	100.67	0.67	4035.5...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418454Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	14-MAR-17	per0314009a	IPB002
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314009a	IPB002
Perchlorate	0.00	0	NA	14-MAR-17	per0314011a	IPB003
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314011a	IPB003
Perchlorate	0.00	0	NA	14-MAR-17	per0314019a	IPB004
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314019a	IPB004
Perchlorate	0.00	0	NA	14-MAR-17	per0314021a	IPB005
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314021a	IPB005
Perchlorate	0.00	0	NA	14-MAR-17	per0314024a	IPB006
Perchlorate-101	0.00	0	NA	14-MAR-17	per0314024a	IPB006

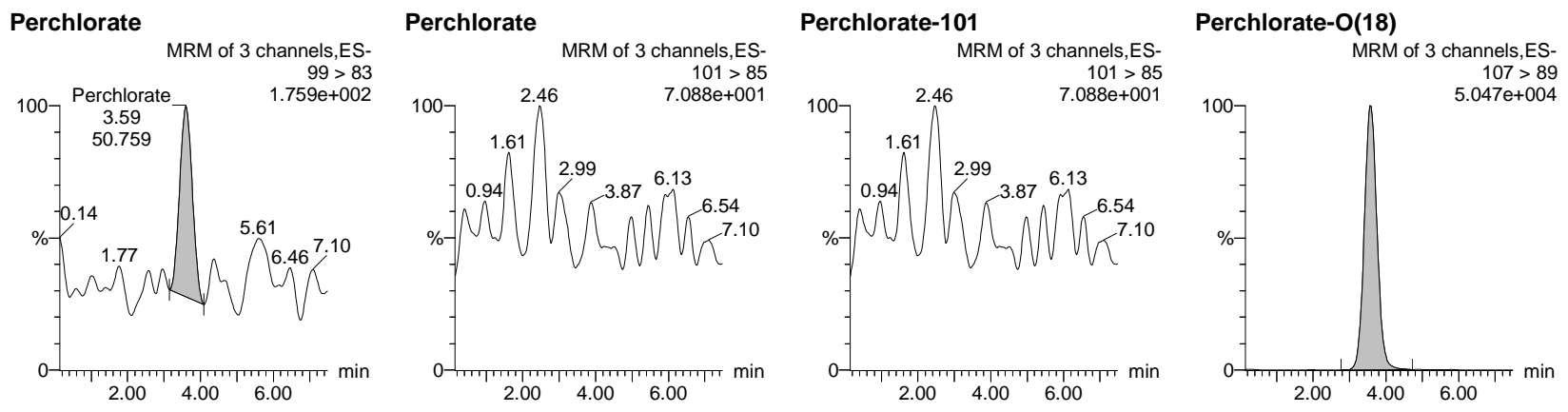
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW

03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314009a
 Date: 14-Mar-2017
 Time: 15:46:15
 ID: IPB002
 Vial: 1:1,A



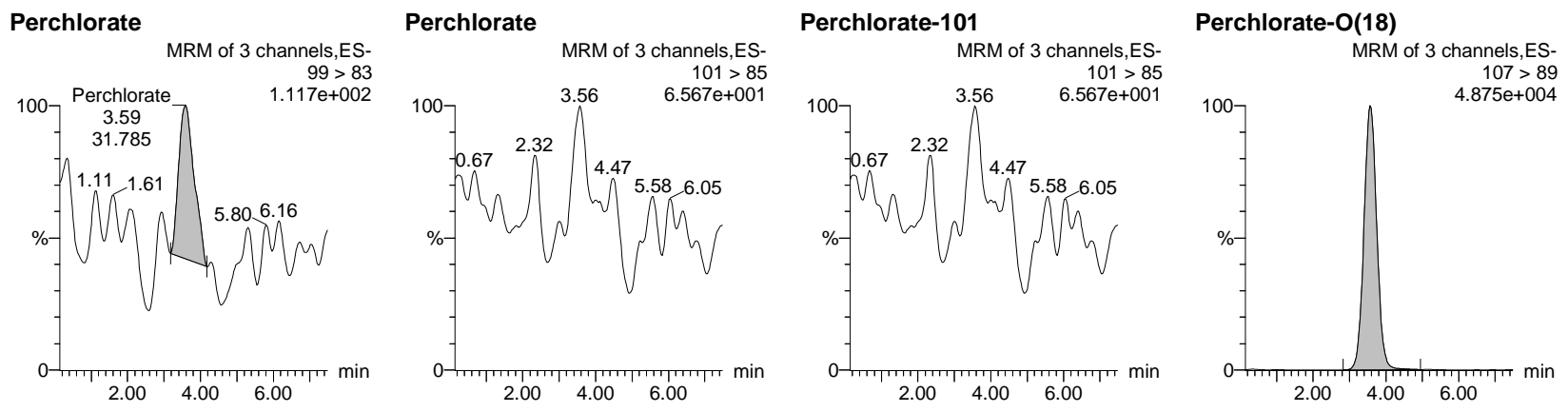
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB002	Perchlorate	99 > 83	3.59	50.759	0.001	bb			0.0011			6.393 0.00
IPB002	Perchlorate-101	101 > 85										
IPB002	Perchlorate-O(18)	107 > 89	3.56	20176.400	20176.400	bb			0.5054	101.08	1.08	3506.0...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314011a
 Date: 14-Mar-2017
 Time: 16:07:10
 ID: IPB003
 Vial: 1:1,A



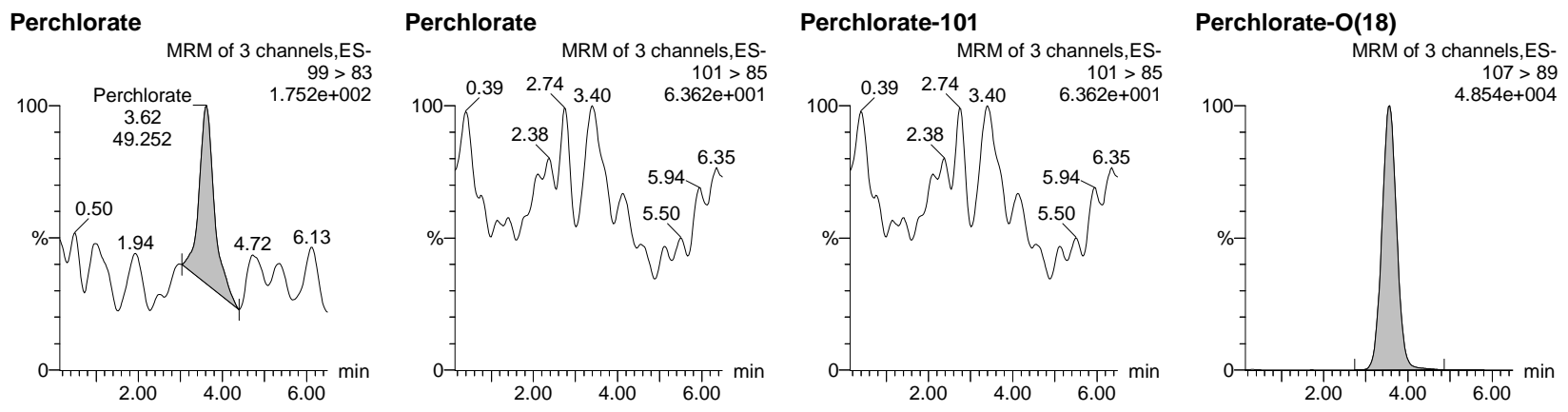
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	3.59	31.785	0.001	bb			0.0007			7.608 0.00
IPB003	Perchlorate-101	101 > 85										
IPB003	Perchlorate-O(18)	107 > 89	3.56	19598.750	19598.750	bb			0.4909	98.19	-1.81	3883.6...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Cww
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314019a
 Date: 14-Mar-2017
 Time: 17:27:33
 ID: IPB004
 Vial: 1:1,A



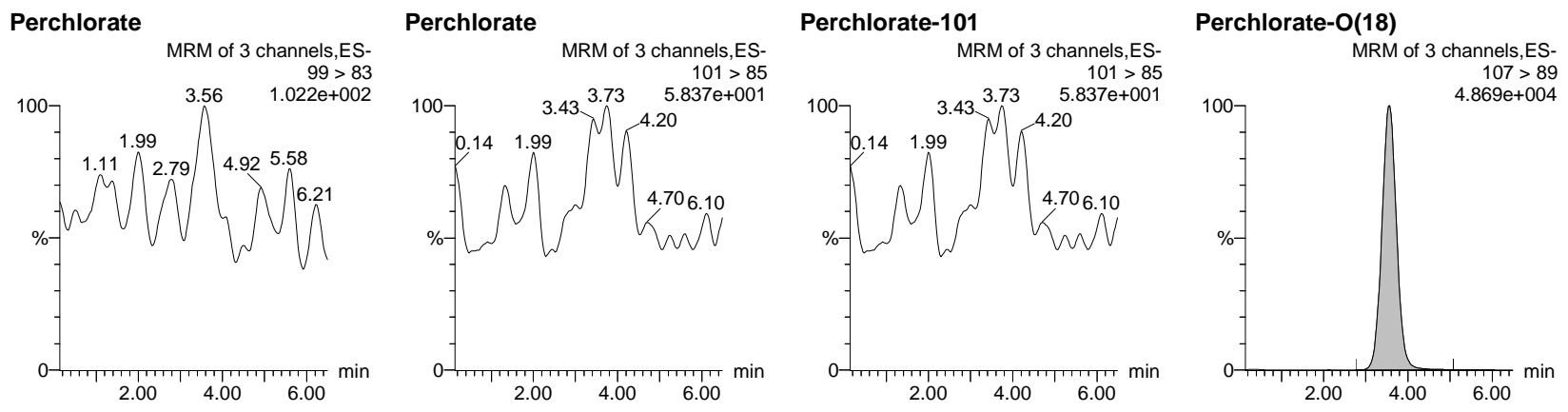
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB004	Perchlorate	99 > 83	3.62	49.252	0.001	bb			0.0011			10.116 0.00
IPB004	Perchlorate-101	101 > 85										
IPB004	Perchlorate-O(18)	107 > 89	3.56	19493.729	19493.729	bb			0.4883	97.66	-2.34	2413.2...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314021a
Date: 14-Mar-2017
Time: 17:46:31
ID: IPB005
Vial: 1:1,A



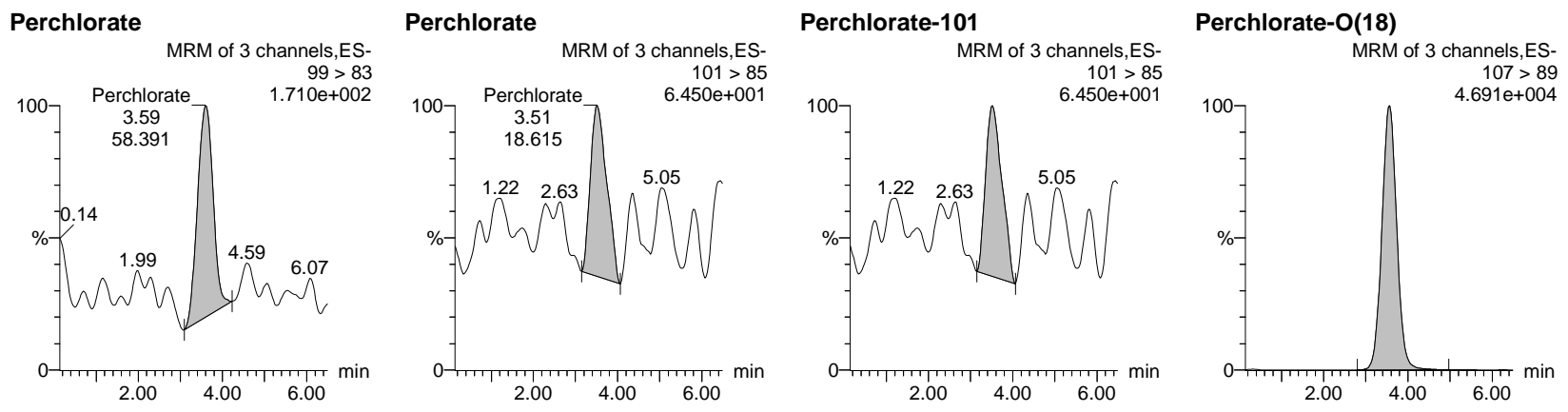
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB005	Perchlorate	99 > 83										0.00
IPB005	Perchlorate-101	101 > 85										
IPB005	Perchlorate-O(18)	107 > 89	3.56	19433.260	19433.260	bb			0.4868	97.36	-2.64	2263.7...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

CWW
 03/15/2017

Dataset: C:\MassLynx\Perchlorate.PRO\per031417a.qld
 Last Altered: Wednesday, March 15, 2017 8:56:56 AM Eastern Daylight Time
 Printed: Wednesday, March 15, 2017 9:47:13 AM Eastern Daylight Time

Name: per0314024a
 Date: 14-Mar-2017
 Time: 18:14:55
 ID: IPB006
 Vial: 1:1,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB006	Perchlorate	99 > 83	3.59	58.391	0.002	bb			0.0014			6.619 3.14
IPB006	Perchlorate-101	101 > 85	3.51	18.615	0.000	bb			0.0013			6.328
IPB006	Perchlorate-O(18)	107 > 89	3.56	18916.057	18916.057	bb			0.4738	94.77	-5.23	3264.3...

Miscellaneous

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1647140 Verified by: _____
 Analyst: Grace Cappelmann
 Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
 Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203746613 MB	14-MAR-2017 12:30:00	10	10	1
1203746614 LCS	14-MAR-2017 12:30:00	10	10	1
1203746617 ICS	14-MAR-2017 12:30:00	10	10	1
418450001	14-MAR-2017 12:30:00	10	10	1
1203746615 MS (418450001)	14-MAR-2017 12:30:00	10	10	1
1203746616 MSD (418450001)	14-MAR-2017 12:30:00	10	10	1
418454001	14-MAR-2017 12:30:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203746617	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161104-2.5-Ba/Ag/H
LCS	1203746614	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203746615	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203746616	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE 1 Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Cww

03/15/2017

Date: 03/14/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per031417a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/14/17

Standard-Samp Reagent Lot#:: 2457559

Alt Check Std. ID: WCL170306-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0314001a	IPB001	GXC1	3/14/2017 14:22			1		USE	B
per0314002a	IPB001	GXC1	3/14/2017 14:33			1		USE	B
per0314003a	WCLICAL-01	GXC1	3/14/2017 14:43			1		USE	I
per0314004a	WCLICAL-02	GXC1	3/14/2017 14:54			1		USE	I
per0314005a	WCLICAL-03	GXC1	3/14/2017 15:04			1		USE	I
per0314006a	WCLICAL-04	GXC1	3/14/2017 15:14			1		USE	I
per0314007a	WCLICAL-05	GXC1	3/14/2017 15:25			1		USE	I
per0314008a	WCLICAL-06	GXC1	3/14/2017 15:35			1		USE	I
per0314009a	IPB002	GXC1	3/14/2017 15:46			1		USE	B
per0314010a	WCLICV	GXC1	3/14/2017 15:56			1		USE	C
per0314011a	IPB003	GXC1	3/14/2017 16:07			1		USE	B
per0314012a	WCLCRI	GXC1	3/14/2017 16:17			1		USE	C
per0314013a	1203746613	GXC1	3/14/2017 16:30	1647141	Various	1	MBAC	USE	S
per0314014a	1203746614	GXC1	3/14/2017 16:40	1647141	Various	1	MBAC	USE	S
per0314015a	1203746617	GXC1	3/14/2017 16:49	1647141	Various	1	MBAC	USE	S
per0314016a	418450001	GXC1	3/14/2017 16:59	1647141	418450	20	MBAC	USE	S
per0314017a	1203746615	GXC1	3/14/2017 17:08	1647141	418450	20	MBAC	USE	S
per0314018a	1203746616	GXC1	3/14/2017 17:18	1647141	418450	20	MBAC	USE	S
per0314019a	IPB004	GXC1	3/14/2017 17:27			1		USE	B
per0314020a	418454001	GXC1	3/14/2017 17:37	1647141	418454	100	MBAC	USE	S
per0314021a	IPB005	GXC1	3/14/2017 17:46			1		USE	B
per0314022a	1203745944	GXC1	3/14/2017 17:55	1646832	418382	1	MBAC	USE	S
per0314023a	WCLCCV	GXC1	3/14/2017 18:05			1		USE	C
per0314024a	IPB006	GXC1	3/14/2017 18:14			1		USE	B
per0314025a	WCLCRI	GXC1	3/14/2017 18:24			1		USE	C
per0314026a	1203745945	GXC1	3/14/2017 18:33	1646832	418382	1	MBAC	USE	S
per0314027a	1203745948	GXC1	3/14/2017 18:43	1646832	418382	1	MBAC	USE	S
per0314028a	418382001	GXC1	3/14/2017 18:52	1646832	418382	1	MBAC	USE	S
per0314029a	418382002	GXC1	3/14/2017 19:02	1646832	418382	1	MBAC	USE	S

per0314030a	418382003	GXC1	3/14/2017 19:11	1646832	418382	1	MBAC	USE	S
per0314031a	1203745946	GXC1	3/14/2017 19:21	1646832	418382	1	MBAC	USE	S
per0314032a	1203745947	GXC1	3/14/2017 19:30	1646832	418382	1	MBAC	USE	S
per0314033a	418382004	GXC1	3/14/2017 19:40	1646832	418382	1	MBAC	USE	S
per0314034a	418382005	GXC1	3/14/2017 19:49	1646832	418382	1	MBAC	USE	S
per0314035a	418382006	GXC1	3/14/2017 19:59	1646832	418382	1	MBAC	USE	S
per0314036a	WCLCCV	GXC1	3/14/2017 20:08			1		USE	C
per0314037a	IPB007	GXC1	3/14/2017 20:17			1		USE	B
per0314038a	WCLCRI	GXC1	3/14/2017 20:27			1		USE	C
per0314039a	418382007	GXC1	3/14/2017 20:36	1646832	418382	1	MBAC	USE	S
per0314040a	WCLCCV	GXC1	3/14/2017 20:46			1		USE	C
per0314041a	IPB008	GXC1	3/14/2017 20:55			1		USE	B
per0314042a	WCLCRI	GXC1	3/14/2017 21:05			1		USE	C

DATA EXCEPTION REPORT			
Mo.Day Yr. 15-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1647141	Sample Numbers: See below		
Potentially affected work order(s)(SDG): 418450,418454			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. In 1203746615 (MS) a high recovery for Perchlorate was observed. The recovery was 296% and the acceptance range is 75-125%. In 1203746616 (MSD) a 0% recovery was observed. The detected concentration in the MSD was lower than that detected in the parent sample.</p>		<p>1. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418450001 (LH18/24-SP650-6423-Grab) and the need to dilute all at a 1:20 dilution prior to analysis. Will report data and note in case narrative.</p>	
Originator's Name: Grace Cappelmann 15-MAR-17		Data Validator/Group Leader: Charles Wilson 15-MAR-17	

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



March 17, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 418681

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 16, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

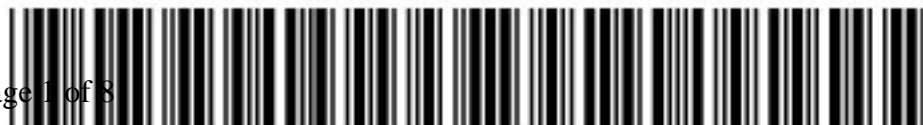


Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	43
Miscellaneous.....	61

Case Narrative

**Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 418681**

March 17, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 16, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

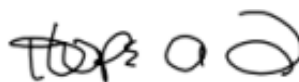
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
418681001	LH18/24-SP650-6424-GRAB

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.



Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

419681

CHAIN OF CUSTODY

Name of Lab Shipping To: GEL Laboratories (843) 556-8171 ATTN: HOPE TAYLOR

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No. 60256135.GWTPT HRUMAR16	
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES			
Prepared By: Scott Beesinger		P.O. Number	
Field Sample I.D. LH18/24-SP650-6424-Grab	Sample Matrix Water	Date / Time 03/15/17 / 15:00	MS / MSD
No. OF CONTAINERS 1		PERCHLORATE	
Analyses		Remarks (Preservatives, etc.) 	
Lab I.D.#		 	

Additional Remarks: **STANDARD TAT** Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	03/15/17	15:30	<i>Hope Taylor</i>	3/16/17	1000						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

SAMPLE RECEIPT & REVIEW FORM

Client: MBAC		SDG/AR/COC/Work Order: 418681	
Received By: <i>veg</i>		Date Received: 03/16/17	
Carrier and Tracking Number		FedEx Express FedEx Ground UPS Field Services Courier Other J401 088 384 4	
Suspected Hazard Information		Yes	No
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
Hazard Class Shipped:		UN#:	
Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u>		CPM / mR/Hr	
Classified as: Rad 1 Rad 2 Rad 3			
If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:			
Sample Receipt Criteria	Yes	NA	No
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Samples requiring cold preservation within ($0 \leq 6$ deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials MEL Date 3/16/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 17 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
 Technical Case Narrative
 Microbac Laboratories, Inc Kentucky Division (MBAC)
 SDG #: 418681**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1648159

Prep Batch Number: 1648158

Sample Analysis

Sample ID	Client ID
418681001	418681001 (LH18/24-SP650-6424-GRAB)
1203748897	Interference Check Sample (ICS)
1203748893	Method Blank (MB)
1203748894	Laboratory Control Sample (LCS)
1203748895	418681001(LH18/24-SP650-6424-GRAB) Matrix Spike (MS)
1203748896	418681001(LH18/24-SP650-6424-GRAB) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418681001 (LH18/24-SP650-6424-GRAB) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203748895 (MS), a high recovery for Perchlorate was observed. The recovery was 147%. In 1203748896 (MSD), a high recovery of Perchlorate was also observed at 126%. The acceptance range of 75-125%. The outliers observed for the matrix spikes were due to the background concentration of the parent sample, 418681001 (LH18/24-SP650-6) and the need of a 1:2 dilution of all prior to analysis. Note, the recovery of Perchlorate was acceptable in the batch LCS, 1203748894. 1203748895 (LH18/24-SP650-6424-GRABMS) and 1203748896 (LH18/24-SP650-6424-GRABMSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203748895 (LH18/24-SP650-6424-GRABMS), 1203748896 (LH18/24-SP650-6424-GRABMSD) and 418681001 (LH18/24-SP650-6424-GRAB) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information**Data Exception (DER) Documentation**

A data exception report (DER) 1614536 was generated for samples 1203748895 (LH18/24-SP650-6424-GRABMS) and 1203748896 (LH18/24-SP650-6424-GRABMSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 418681 GEL Work Order: 418681

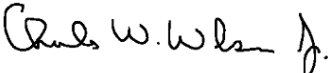
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 17 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1648158

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6424-GRAB

Date Received: 16-MAR-17

GEL Job No (SDG): 418681

GEL Sample ID: 418681001

Date Filtered: 16-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.1	.4	2.37	ug/L		2	16-MAR-17 19:08	per0316016a
	Perchlorate-O(18)			0.969	ug/L		2	16-MAR-17 19:08	per0316016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 418681

Extract Batch Code: 1648158

Date Filtered: 16-MAR-17

Matrix: WATER

Sample ID: 1203748894

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.19	ug/L	95		85 - 115
Perchlorate-O(18)		.497	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 418681Extract Batch Code: 1648158Date Filtered: 16-MAR-17Matrix: WATERSample ID: 1203748897

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.201	ug/L	101		70 - 130
Perchlorate-O(18)		.526	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 418681Extract Batch Code: 1648158Date Extracted: 16-MAR-17GEL MS/PS ID: 1203748895Client ID: LH18/24-SP650-6424-GRABGEL MSD/PSD ID: 1203748896QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	2.37	ug/L	2.67	147 *	2.62	126 *	2	30	75 - 125
Perchlorate-O(18)	0	0.969	ug/L	0.927		.942		2		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0316006a	16-MAR-17	18754.9				
Lower Area Limit			9377.45				
Upper Area Limit			28132.35				
1203748893	per0316013a	16-MAR-17 18:43	18235.3	3.18	3.206	1.008	
1203748894	per0316014a	16-MAR-17 18:51	18255.7	3.21	3.206	.999	
1203748897	per0316015a	16-MAR-17 19:00	19344.2	3.07	3.09567	1.008	
418681001	per0316016a	16-MAR-17 19:08	17814.7	3.15	3.17835	1.009	
1203748895	per0316017a	16-MAR-17 19:16	17038.1	3.15	3.17835	1.009	
1203748896	per0316018a	16-MAR-17 19:25	17317.5	3.12	3.15083	1.01	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1648158

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6424-GRAB

Date Received: 16-MAR-17

GEL Job No (SDG): 418681

GEL Sample ID: 418681001

Date Filtered: 16-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.1	.4	2.37	ug/L		2	16-MAR-17 19:08	per0316016a
	Perchlorate-O(18)			0.969	ug/L		2	16-MAR-17 19:08	per0316016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

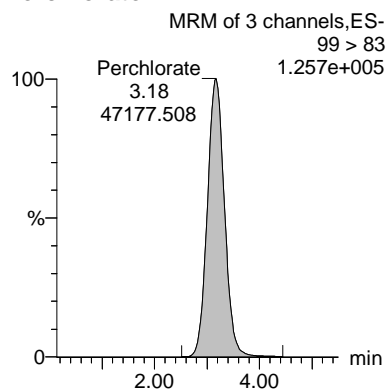
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
 Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
 Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

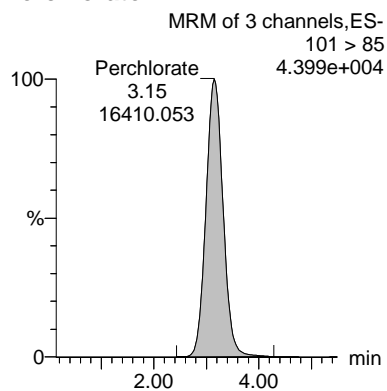
CWW
 03/17/2017

Name: per0316016a
Date: 16-Mar-2017
Time: 19:08:30
ID: 418681001
Vial: 1:3,D

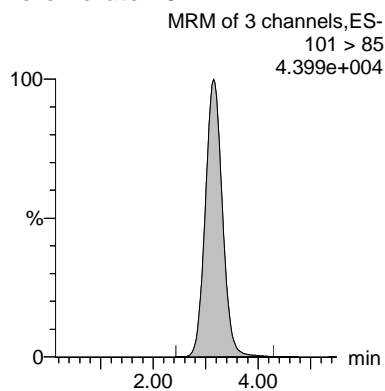
Perchlorate



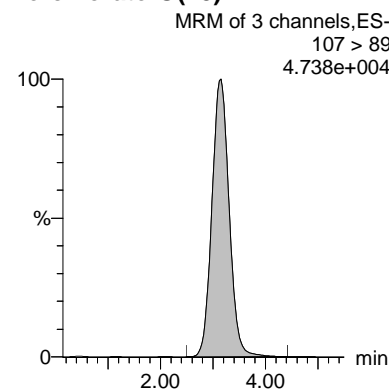
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
418681001	Perchlorate	99 > 83	3.18	47177.508	1.324	bb			1.1859			6358.2... 2.87
418681001	Perchlorate-101	101 > 85	3.15	16410.053	0.461	bb			1.2565			1196.0...
418681001	Perchlorate-O(18)	107 > 89	3.15	17814.713	17814.713	bb			0.4847	96.94	-3.06	5610.4...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 16-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname

Perchlorate

Coefficient of Determination:

Calibration Curve:

1.11667

Response Type:

Internal Standard

Curve Type:

RF

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 16-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .36667Response Type: Internal StandardCurve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld

GL
03/17/2017

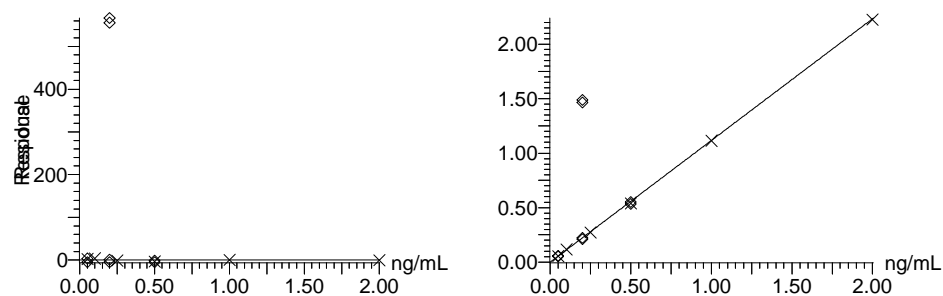
CW
03/17/2017

Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time

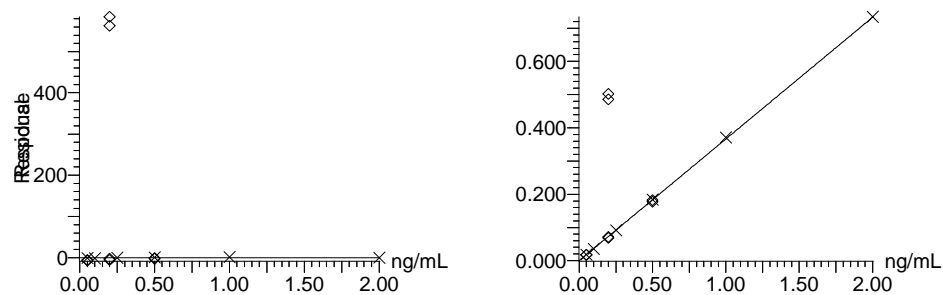
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031617a.mdb 17 Mar 2017 08:59:41
Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031617a.cdb 17 Mar 2017 09:00:08

Compound name: Perchlorate
Response Factor: 1.11654
RRF SD: 0.0291351, % Relative SD: 2.60941
Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)
Curve type: RF



Compound name: Perchlorate-101
Response Factor: 0.366541
RRF SD: 0.00386016, % Relative SD: 1.05313
Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)
Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld

Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time

Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

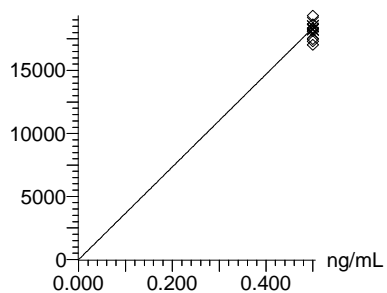
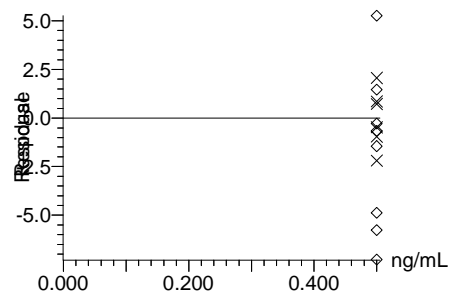
Compound name: Perchlorate-O(18)

Response Factor: 36752.5

RRF SD: 557.414, % Relative SD: 1.51667

Response type: External Std, Area

Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 3 of 21

Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld

GL
03/17/2017CW
03/17/2017

Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time

Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

Name: per0316003a

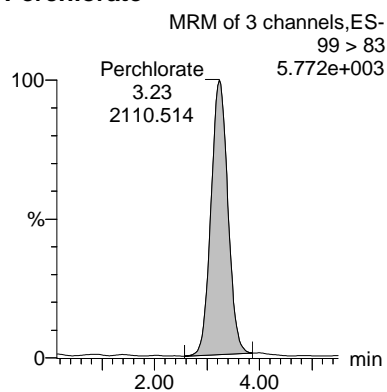
Date: 16-Mar-2017

Time: 17:18:37

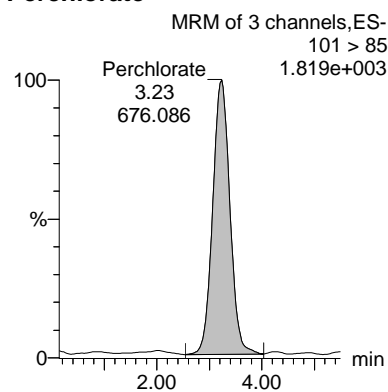
ID: WCL170306-01

Vial: 1:1,B

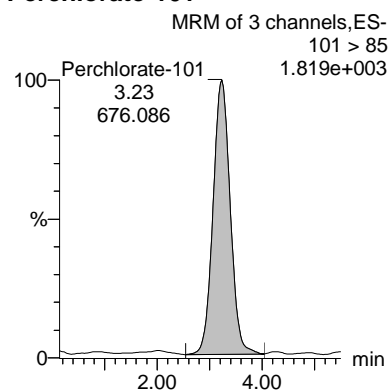
Perchlorate



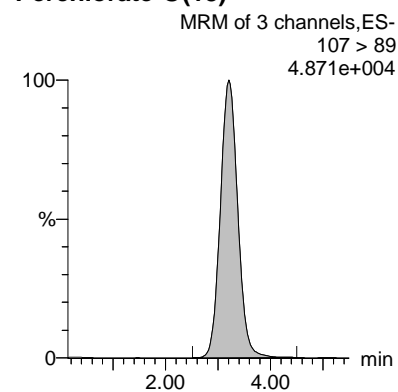
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-01	Perchlorate	99 > 83	3.23	2110.514	0.057	bb			0.0510	101.98	1.98	494.166	3.12
WCL170306-01	Perchlorate-101	101 > 85	3.23	676.086	0.018	bb			0.0498	99.52	-0.48	387.997	
WCL170306-01	Perchlorate-O(18)	107 > 89	3.21	18534.635	18534.635	bb			0.5043	100.86	0.86	3419.3...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

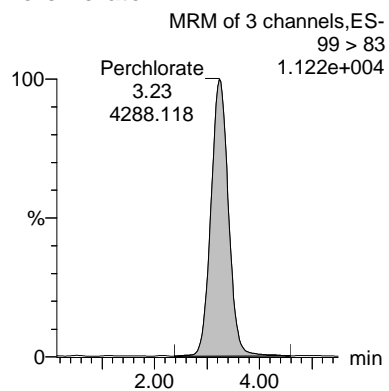
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

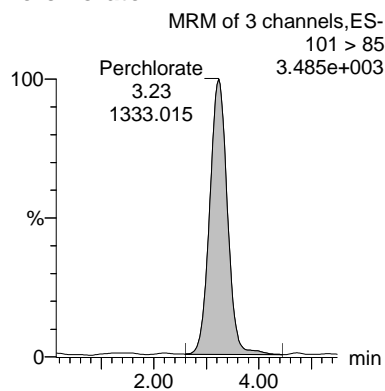
CWW
 03/17/2017

Name: per0316004a
Date: 16-Mar-2017
Time: 17:27:04
ID: WCL170306-02
Vial: 1:1,C

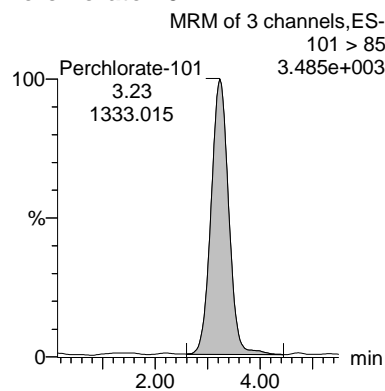
Perchlorate



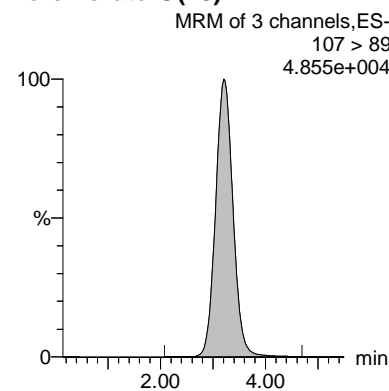
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-02	Perchlorate	99 > 83	3.23	4288.118	0.116	bb			0.1038	103.75	3.75	1793.3...	3.22
WCL170306-02	Perchlorate-101	101 > 85	3.23	1333.015	0.036	bb			0.0982	98.25	-1.75	340.453	
WCL170306-02	Perchlorate-O(18)	107 > 89	3.21	18508.332	18508.332	bb			0.5036	100.72	0.72	2985.7...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

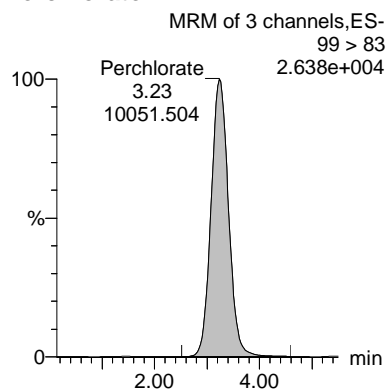
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

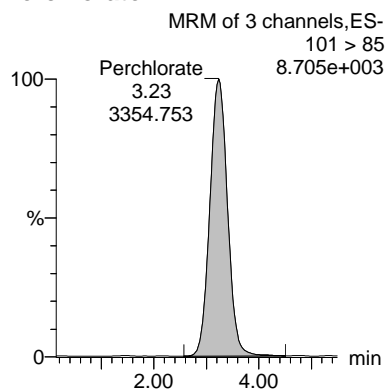
CWW
 03/17/2017

Name: per0316005a
Date: 16-Mar-2017
Time: 17:35:31
ID: WCL170306-03
Vial: 1:1,D

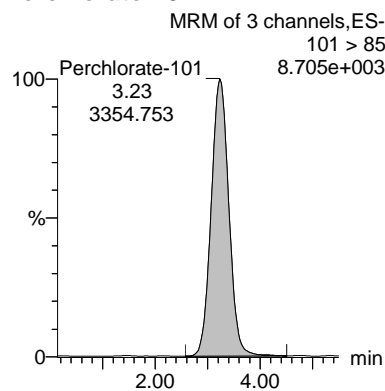
Perchlorate



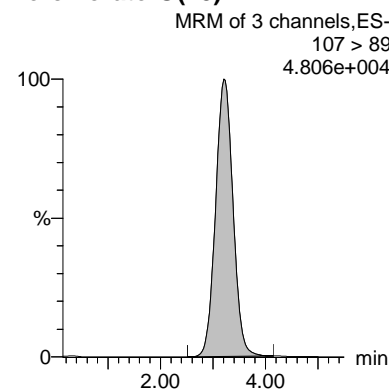
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
WCL170306-03	Perchlorate	99 > 83	3.23	10051.504	0.275	bb			0.2461	98.45	-1.55	3456.3...
WCL170306-03	Perchlorate-101	101 > 85	3.23	3354.753	0.092	bb			0.2502	100.09	0.09	1133.2...
WCL170306-03	Perchlorate-O(18)	107 > 89	3.21	18288.639	18288.639	bb			0.4976	99.52	-0.48	2727.3...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

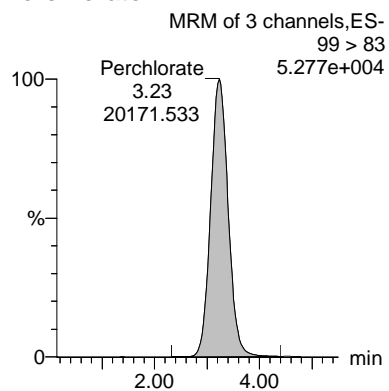
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

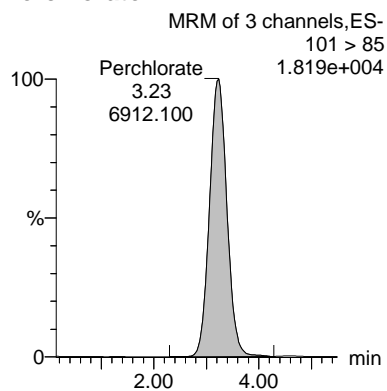
CWW
 03/17/2017

Name: per0316006a
Date: 16-Mar-2017
Time: 17:43:56
ID: WCL170306-04
Vial: 1:1,E

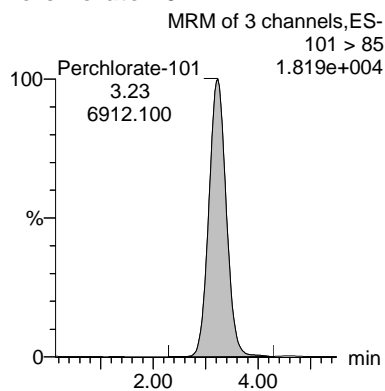
Perchlorate



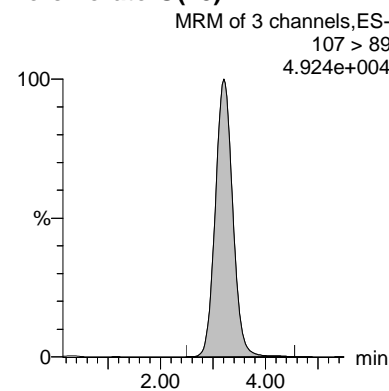
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-04	Perchlorate	99 > 83	3.23	20171.533	0.538	bb			0.4816	96.33	-3.67	4157.3...	2.92
WCL170306-04	Perchlorate-101	101 > 85	3.23	6912.100	0.184	bb			0.5027	100.55	0.55	2996.5...	
WCL170306-04	Perchlorate-O(18)	107 > 89	3.21	18754.936	18754.936	bb			0.5103	102.06	2.06	1675.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

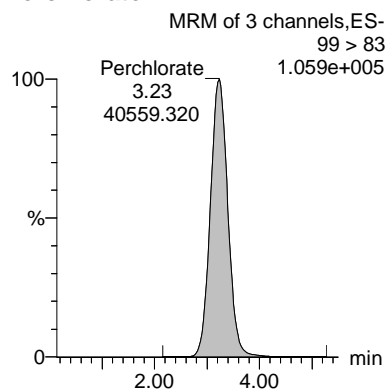
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

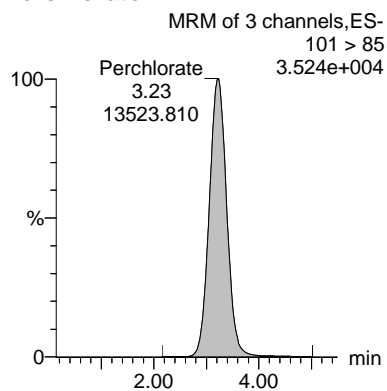
CWW
 03/17/2017

Name: per0316007a
Date: 16-Mar-2017
Time: 17:52:22
ID: WCL170306-05
Vial: 1:1,F

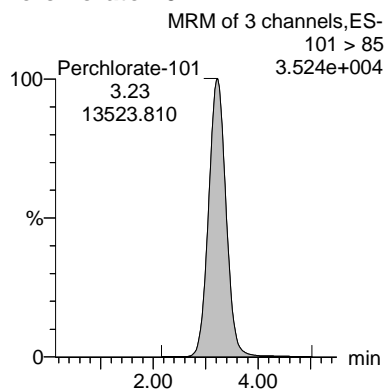
Perchlorate



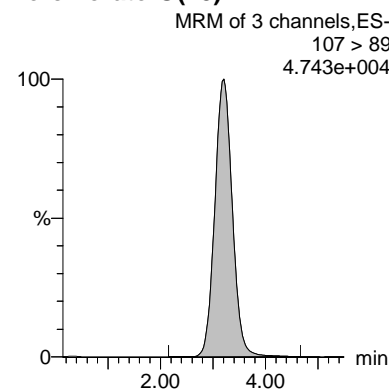
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-05	Perchlorate	99 > 83	3.23	40559.320	1.114	bb			0.9980	99.80	-0.20	9869.9...	3.00
WCL170306-05	Perchlorate-101	101 > 85	3.23	13523.810	0.372	bb			1.0137	101.37	1.37	1716.3...	
WCL170306-05	Perchlorate-O(18)	107 > 89	3.21	18198.744	18198.744	bb			0.4952	99.03	-0.97	2054.3...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

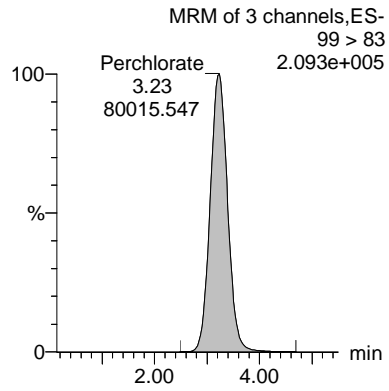
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

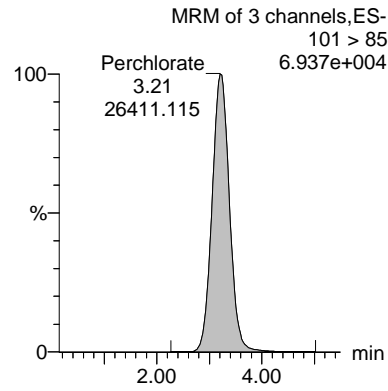
CWW
 03/17/2017

Name: per0316008a
Date: 16-Mar-2017
Time: 18:00:48
ID: WCL170306-06
Vial: 1:2,A

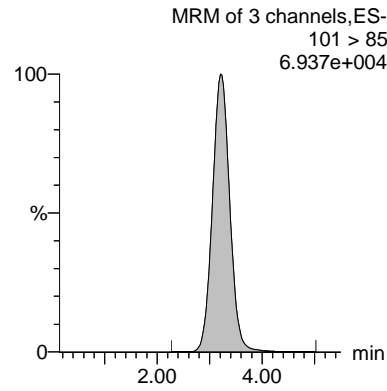
Perchlorate



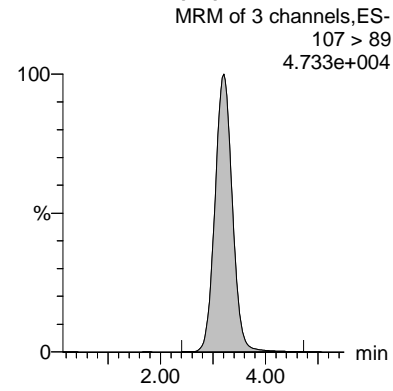
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-06	Perchlorate	99 > 83	3.23	80015.547	2.226	bb			1.9937	99.69	-0.31	5718.8...	3.03
WCL170306-06	Perchlorate-101	101 > 85	3.21	26411.115	0.735	bb			2.0046	100.23	0.23	3560.9...	
WCL170306-06	Perchlorate-O(18)	107 > 89	3.21	17972.184	17972.184	bb			0.4890	97.80	-2.20	2242.3...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	98.83	16-MAR-17 18:17	per0316010a
Perchlorate Isotope Ratio		3.1		16-MAR-17 18:17	per0316010a
Perchlorate-101	.5	.49	97.03	16-MAR-17 18:17	per0316010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

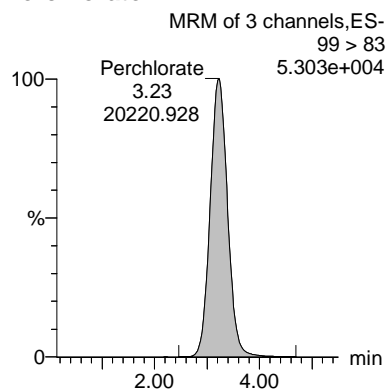
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

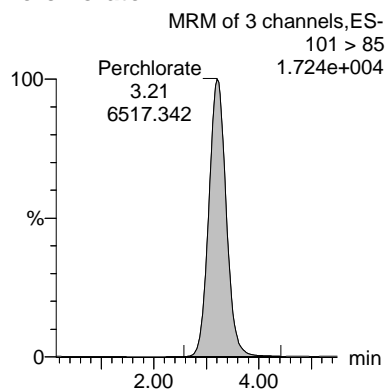
CWW
 03/17/2017

Name: per0316010a
Date: 16-Mar-2017
Time: 18:17:42
ID: WCL170306-07ICV
Vial: 1:2,B

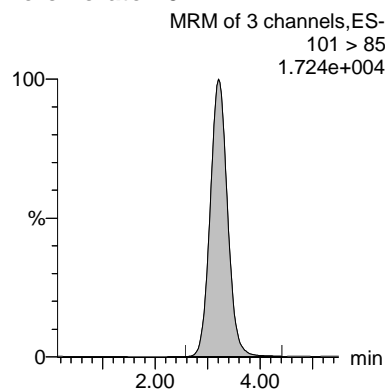
Perchlorate



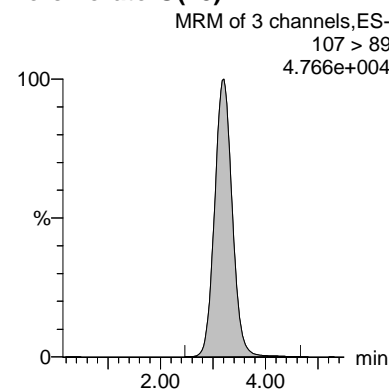
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07ICV	Perchlorate	99 > 83	3.23	20220.928	0.552	bb			0.4942	98.83	-1.17	8390.0...	3.10
WCL170306-07ICV	Perchlorate-101	101 > 85	3.21	6517.342	0.178	bb			0.4852	97.03	-2.97	1593.8...	
WCL170306-07ICV	Perchlorate-O(18)	107 > 89	3.21	18324.717	18324.717	bb			0.4986	99.72	-0.28	3268.8...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.48	95.28	16-MAR-17 19:33	per0316019a
Perchlorate Isotope Ratio		2.92		16-MAR-17 19:33	per0316019a
Perchlorate-101	.5	.5	99.38	16-MAR-17 19:33	per0316019a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

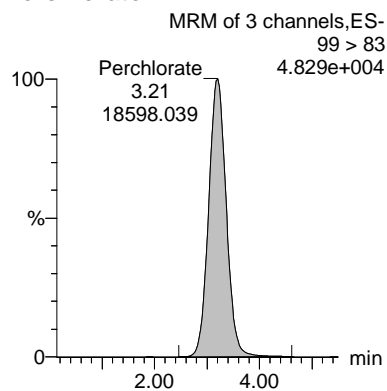
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

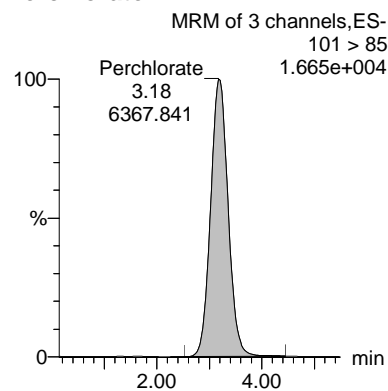
CWW
 03/17/2017

Name: per0316019a
Date: 16-Mar-2017
Time: 19:33:49
ID: WCL170306-07CCV
Vial: 1:2,B

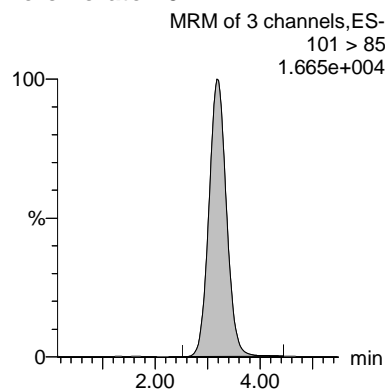
Perchlorate



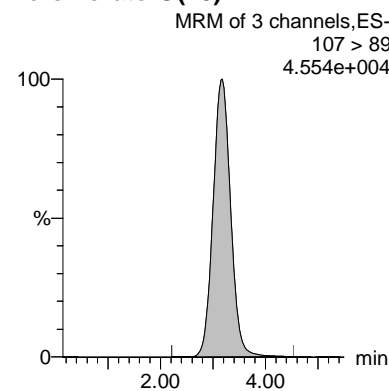
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07CCV	Perchlorate	99 > 83	3.21	18598.039	0.532	bb			0.4764	95.28	-4.72	3425.7...	2.92
WCL170306-07CCV	Perchlorate-101	101 > 85	3.18	6367.841	0.182	bb			0.4969	99.38	-0.62	3107.7...	
WCL170306-07CCV	Perchlorate-O(18)	107 > 89	3.18	17481.916	17481.916	bb			0.4757	95.13	-4.87	2236.9...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	95.19	16-MAR-17 18:34	per0316012a
Perchlorate Isotope Ratio		3.09		16-MAR-17 18:34	per0316012a
Perchlorate-101	.05	.05	93.79	16-MAR-17 18:34	per0316012a
Perchlorate	.05	.05	103.62	16-MAR-17 19:50	per0316021a
Perchlorate Isotope Ratio		3.41		16-MAR-17 19:50	per0316021a
Perchlorate-101	.05	.05	92.61	16-MAR-17 19:50	per0316021a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

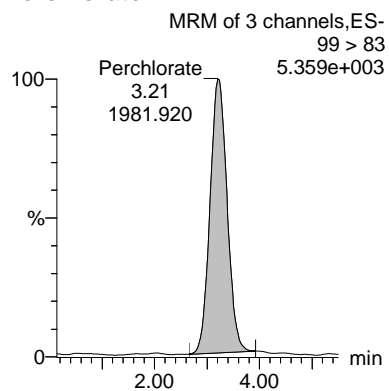
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

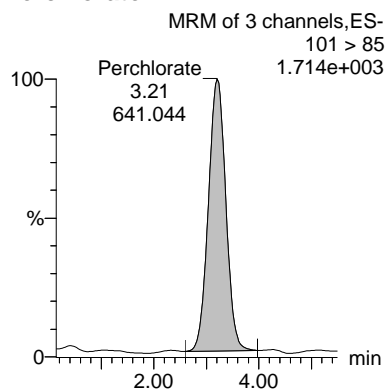
CWW
 03/17/2017

Name: per0316012a
Date: 16-Mar-2017
Time: 18:34:37
ID: WCL170306-08CRI
Vial: 1:2,C

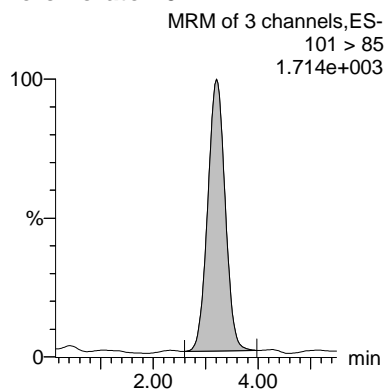
Perchlorate



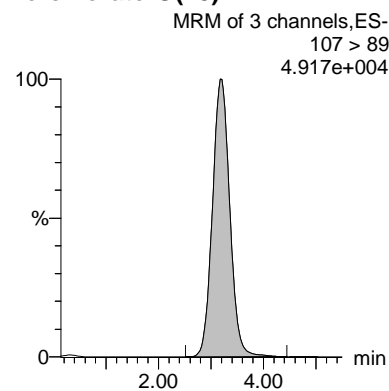
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.21	1981.920	0.053	bb			0.0476	95.19	-4.81	268.275	3.09
WCL170306-08CRI	Perchlorate-101	101 > 85	3.21	641.044	0.017	bb			0.0469	93.79	-6.21	48.729	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.18	18646.672	18646.672	bb			0.5074	101.47	1.47	2861.6...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

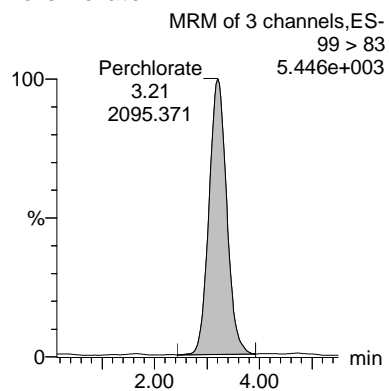
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

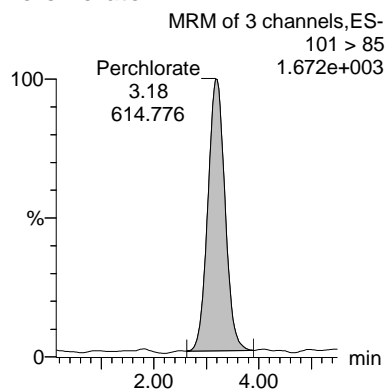
CWW
 03/17/2017

Name: per0316021a
Date: 16-Mar-2017
Time: 19:50:43
ID: WCL170306-08CRI
Vial: 1:2,C

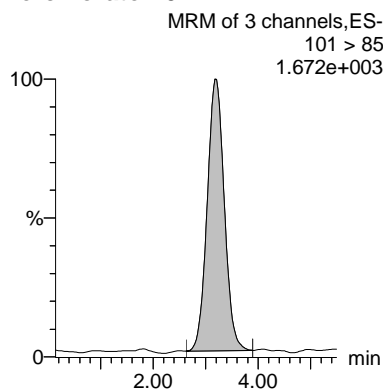
Perchlorate



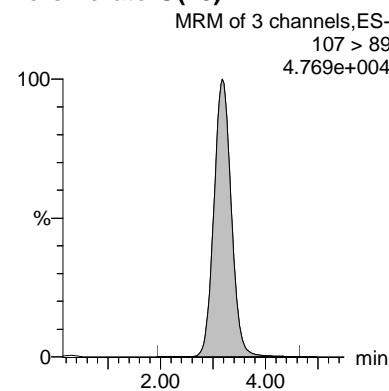
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	3.21	2095.371	0.058	bb			0.0518	103.62	3.62	555.439	3.41
WCL170306-08CRI	Perchlorate-101	101 > 85	3.18	614.776	0.017	bb			0.0463	92.61	-7.39	339.384	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.18	18110.336	18110.336	bb			0.4928	98.55	-1.45	7562.2...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1648158

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

MB

Date Received: 16-MAR-17

GEL Job No (SDG): 418681

GEL Sample ID: 1203748893

Date Filtered: 16-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	16-MAR-17 18:43	per0316013a
	Perchlorate-O(18)			0.496	ug/L		1	16-MAR-17 18:43	per0316013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

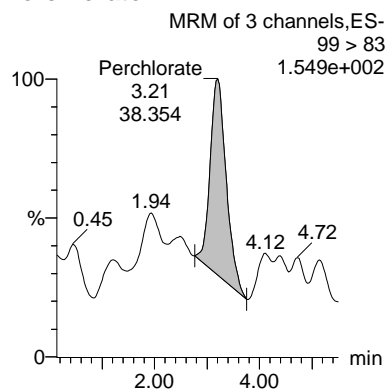
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

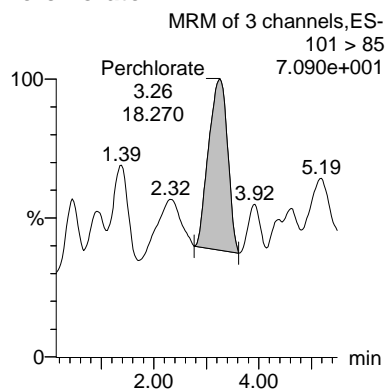
CWW
 03/17/2017

Name: per0316013a
Date: 16-Mar-2017
Time: 18:43:07
ID: 1203748893
Vial: 1:3,A

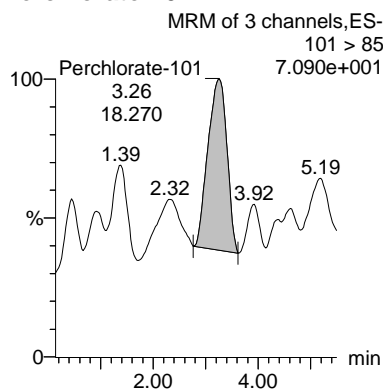
Perchlorate



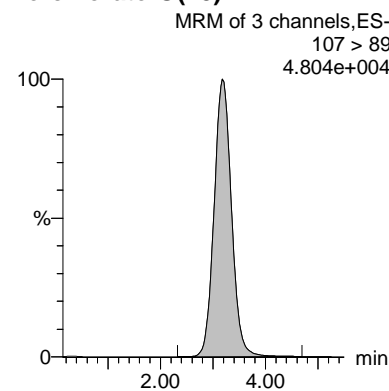
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203748893	Perchlorate	99 > 83	3.21	38.354	0.001	bb			0.0009			7.398 2.10
1203748893	Perchlorate-101	101 > 85	3.26	18.270	0.001	bb			0.0014			4.822
1203748893	Perchlorate-O(18)	107 > 89	3.18	18235.346	18235.346	bb			0.4962	99.23	-0.77	4769.1...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1648158

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 16-MAR-17

GEL Job No (SDG): 418681

GEL Sample ID: 1203748894

Date Filtered: 16-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.190	ug/L	J	1	16-MAR-17 18:51	per0316014a
	Perchlorate-O(18)			0.497	ug/L		1	16-MAR-17 18:51	per0316014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

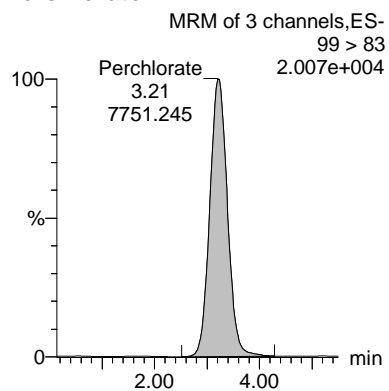
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
 Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
 Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

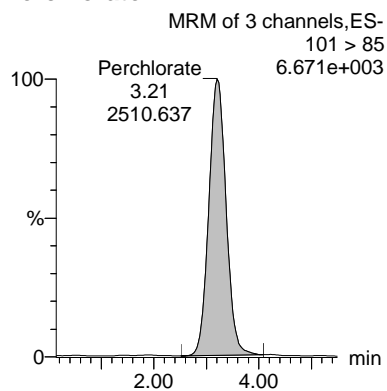
CWW
 03/17/2017

Name: per0316014a
Date: 16-Mar-2017
Time: 18:51:35
ID: 1203748894
Vial: 1:3,B

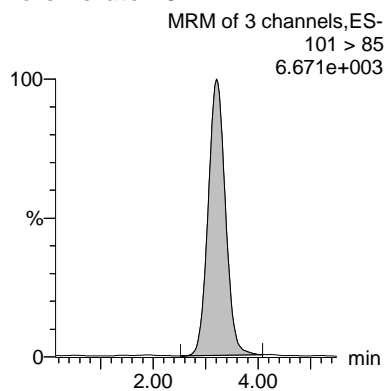
Perchlorate



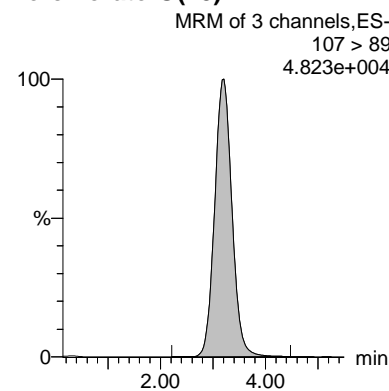
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203748894	Perchlorate	99 > 83	3.21	7751.245	0.212	bb			0.1901	95.07	-4.93	2110.8...	3.09
1203748894	Perchlorate-101	101 > 85	3.21	2510.637	0.069	bb			0.1876	93.80	-6.20	386.603	
1203748894	Perchlorate-O(18)	107 > 89	3.21	18255.676	18255.676	bb			0.4967	99.34	-0.66	2469.0...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1648158

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 418681

GEL Sample ID: 1203748897

Date Filtered: 16-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.201	ug/L		1	16-MAR-17 19:00	per0316015a
	Perchlorate-O(18)			0.526	ug/L		1	16-MAR-17 19:00	per0316015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

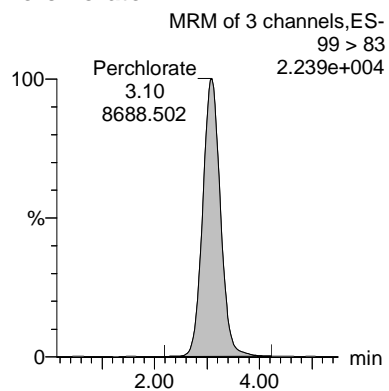
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

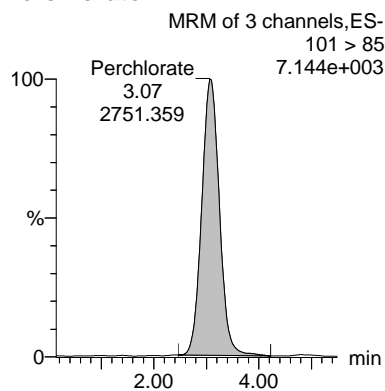
CWW
 03/17/2017

Name: per0316015a
Date: 16-Mar-2017
Time: 19:00:02
ID: 1203748897
Vial: 1:3,C

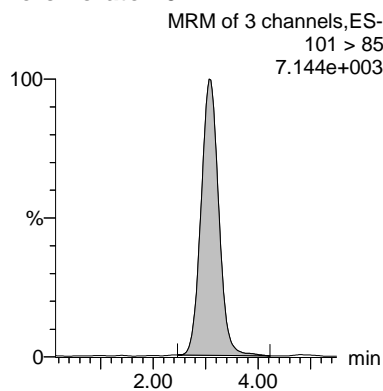
Perchlorate



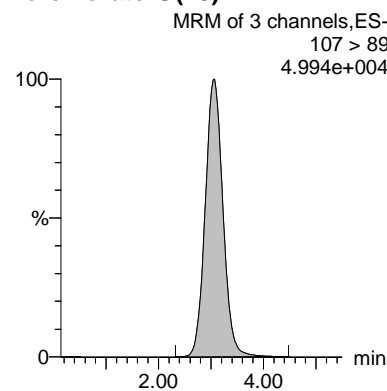
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203748897	Perchlorate	99 > 83	3.10	8688.502	0.225	bb			0.2011	100.57	0.57	1987.9...	3.16
1203748897	Perchlorate-101	101 > 85	3.07	2751.359	0.071	bb			0.1940	97.01	-2.99	538.384	
1203748897	Perchlorate-O(18)	107 > 89	3.07	19344.205	19344.205	bb			0.5263	105.27	5.27	4095.6...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1648158Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6424-GRABMSDate Received: 16-MAR-17GEL Job No (SDG): 418681GEL Sample ID: 1203748895Date Filtered: 16-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.1	.4	2.67	ug/L		2	16-MAR-17 19:16	per0316017a
	Perchlorate-O(18)			0.927	ug/L		2	16-MAR-17 19:16	per0316017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =
Instrument Value X $\frac{\text{Concentrated Extract Volume}}{\text{Aliquot}}$ X $\frac{1}{\% \text{Solids}}$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

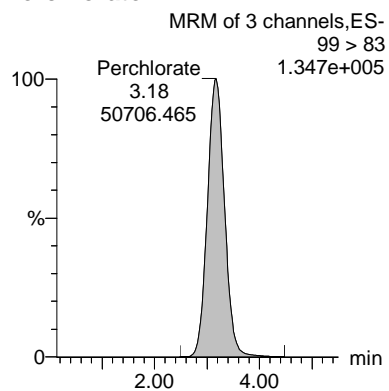
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

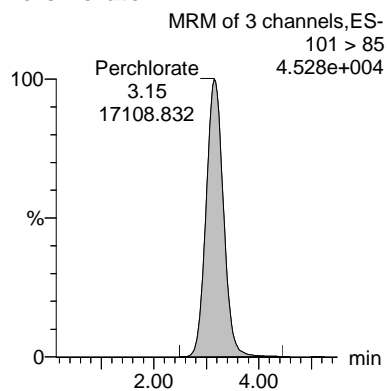
CWW
 03/17/2017

Name: per0316017a
Date: 16-Mar-2017
Time: 19:16:57
ID: 1203748895
Vial: 1:3,E

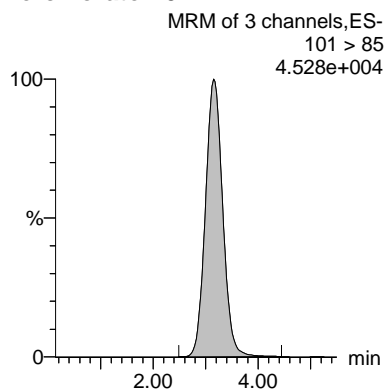
Perchlorate



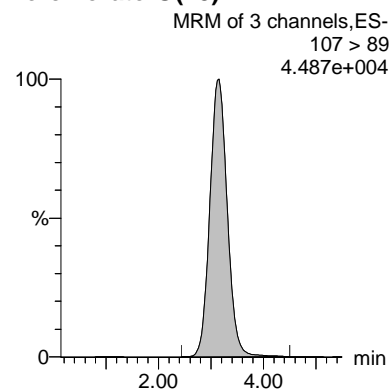
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203748895	Perchlorate	99 > 83	3.18	50706.465	1.488	bb			1.3327	666.36	566.36	6405.5...	2.96
1203748895	Perchlorate-101	101 > 85	3.15	17108.832	0.502	bb			1.3698	684.88	584.88	1028.6...	
1203748895	Perchlorate-O(18)	107 > 89	3.15	17038.141	17038.141	bb			0.4636	92.72	-7.28	2223.8...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1648158Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6424-GRABMSDDate Received: 16-MAR-17GEL Job No (SDG): 418681GEL Sample ID: 1203748896Date Filtered: 16-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.1	.4	2.62	ug/L		2	16-MAR-17 19:25	per0316018a
	Perchlorate-O(18)			0.942	ug/L		2	16-MAR-17 19:25	per0316018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

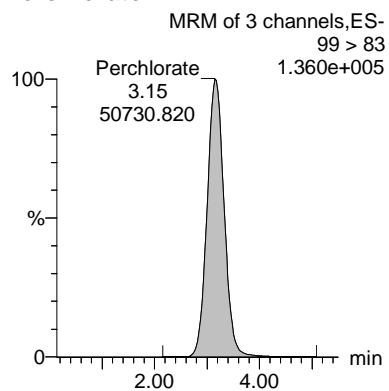
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

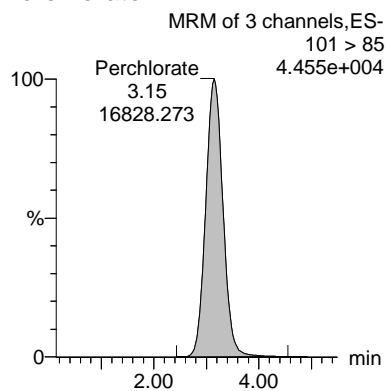
CWW
 03/17/2017

Name: per0316018a
Date: 16-Mar-2017
Time: 19:25:23
ID: 1203748896
Vial: 1:3,F

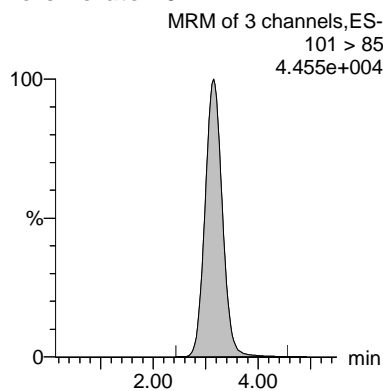
Perchlorate



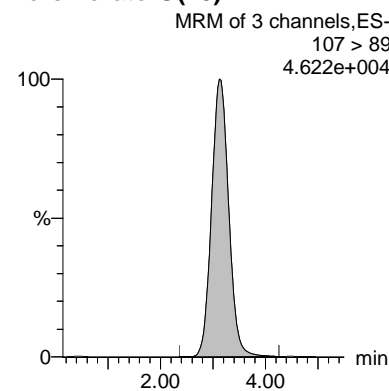
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203748896	Perchlorate	99 > 83	3.15	50730.820	1.465	bb			1.3118	655.92	555.92	8654.2...	3.01
1203748896	Perchlorate-101	101 > 85	3.15	16828.273	0.486	bb			1.3256	662.78	562.78	3628.7...	
1203748896	Perchlorate-O(18)	107 > 89	3.12	17317.537	17317.537	bb			0.4712	94.24	-5.76	2355.2...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	16-MAR-17	per0316001a	IPB001
Perchlorate-101	0.00	0	NA	16-MAR-17	per0316001a	IPB001
Perchlorate	0.00	0	NA	16-MAR-17	per0316002a	IPB001
Perchlorate-101	0.00	0	NA	16-MAR-17	per0316002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
 Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
 Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

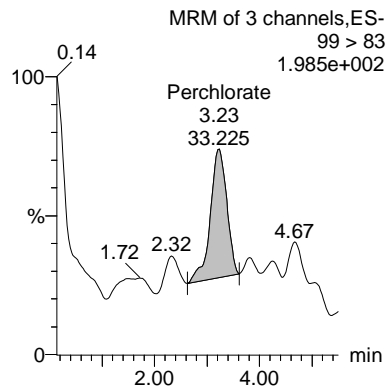
GL
 03/17/2017

CWW
 03/17/2017

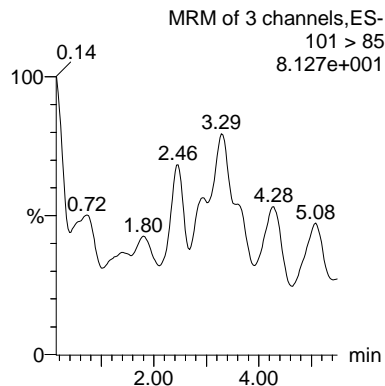
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031617a.mdb 17 Mar 2017 08:59:41
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031617a.cdb 17 Mar 2017 09:00:08

Name: per0316001a
 Date: 16-Mar-2017
 Time: 17:01:39
 ID: IPB001
 Vial: 1:1,A

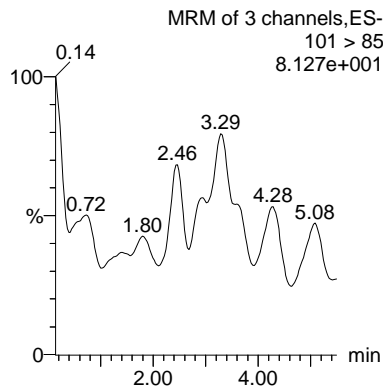
Perchlorate



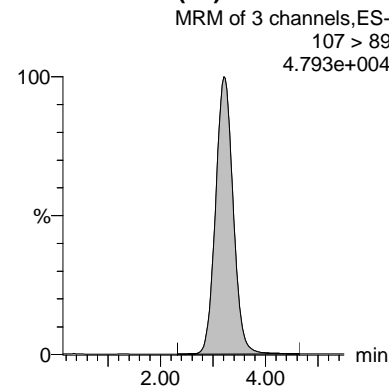
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.23	33.225	0.001	bb			0.0008			9.282 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	3.21	18471.230	18471.230	bb			0.5026	100.52	0.52	5146.3...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

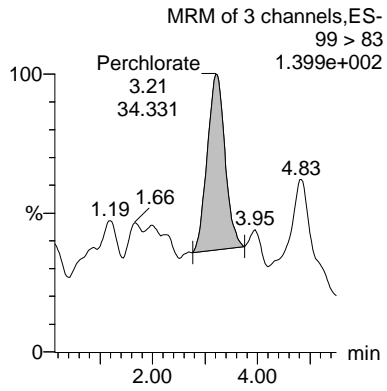
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

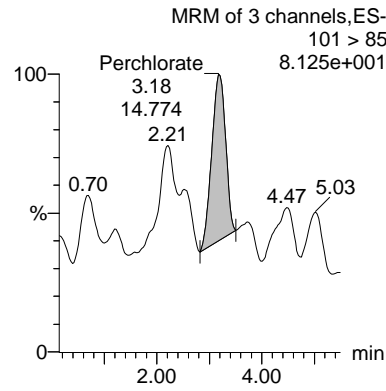
CWW
 03/17/2017

Name: per0316002a
Date: 16-Mar-2017
Time: 17:10:10
ID: IPB001
Vial: 1:1,A

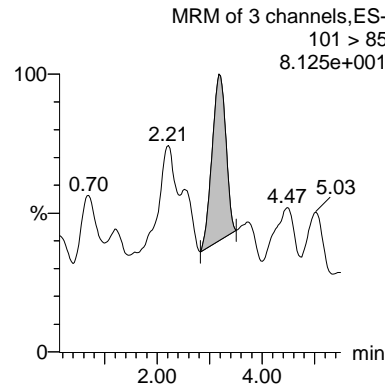
Perchlorate



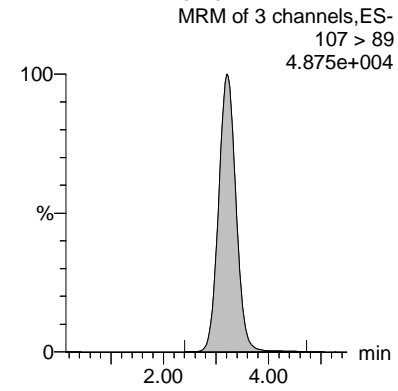
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.21	34.331	0.001	bb			0.0008			11.976 2.32
IPB001	Perchlorate-101	101 > 85	3.18	14.774	0.000	bb			0.0011			4.545
IPB001	Perchlorate-O(18)	107 > 89	3.21	18545.260	18545.260	bb			0.5046	100.92	0.92	4536.3...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418681Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	16-MAR-17	per0316009a	IPB002
Perchlorate-101	0.00	0	NA	16-MAR-17	per0316009a	IPB002
Perchlorate	0.00	0	NA	16-MAR-17	per0316011a	IPB003
Perchlorate-101	0.00	0	NA	16-MAR-17	per0316011a	IPB003
Perchlorate	0.00	0	NA	16-MAR-17	per0316020a	IPB004
Perchlorate-101	0.00	0	NA	16-MAR-17	per0316020a	IPB004

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

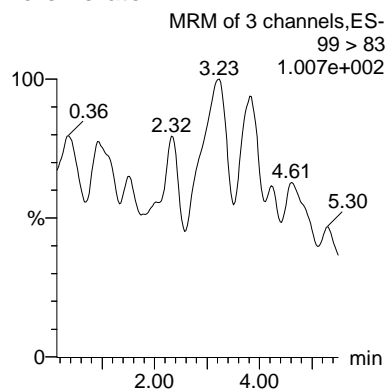
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

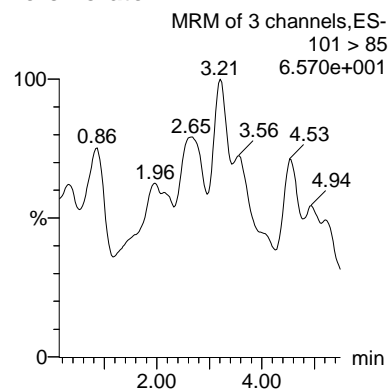
CW
 03/17/2017

Name: per0316009a
Date: 16-Mar-2017
Time: 18:09:15
ID: IPB002
Vial: 1:1,A

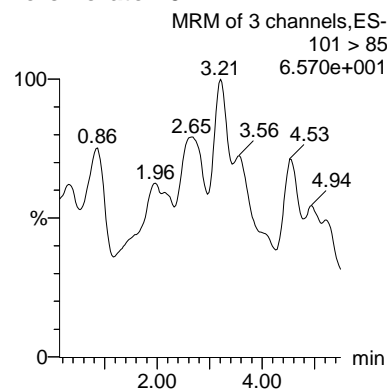
Perchlorate



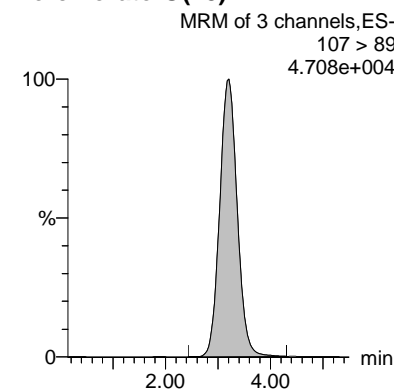
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB002	Perchlorate	99 > 83										0.00
IPB002	Perchlorate-101	101 > 85										
IPB002	Perchlorate-O(18)	107 > 89	3.21	18032.516	18032.516	bb			0.4906	98.13	-1.87	1421.7...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

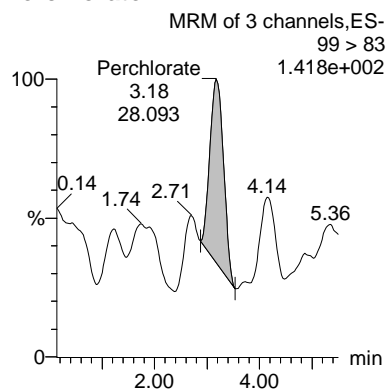
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

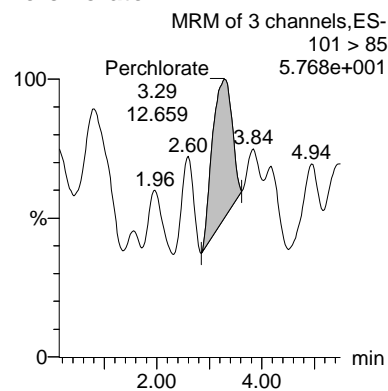
CWJ
 03/17/2017

Name: per0316011a
Date: 16-Mar-2017
Time: 18:26:10
ID: IPB003
Vial: 1:1,A

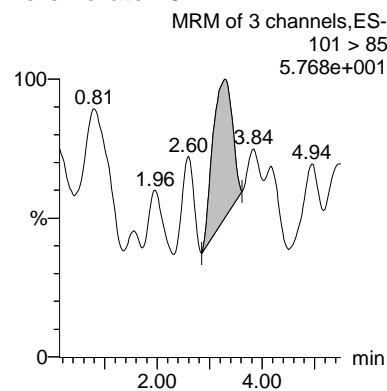
Perchlorate



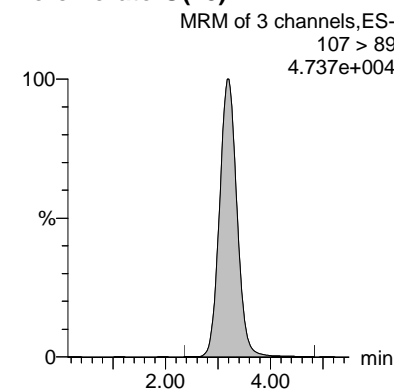
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB003	Perchlorate	99 > 83	3.18	28.093	0.001	bb			0.0007			2.582	2.22
IPB003	Perchlorate-101	101 > 85	3.29	12.659	0.000	bb			0.0010			1.973	
IPB003	Perchlorate-O(18)	107 > 89	3.21	18050.070	18050.070	bb			0.4911	98.23	-1.77	2646.6...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

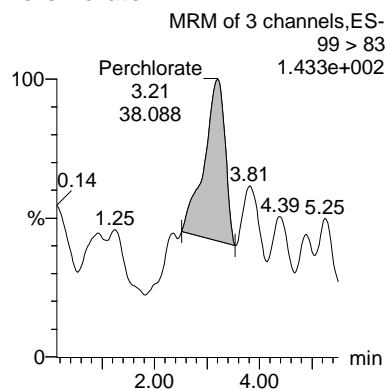
Dataset: C:\MassLynx\Perchlorate.PRO\per031617a.qld
Last Altered: Friday, March 17, 2017 9:00:09 AM Eastern Daylight Time
Printed: Friday, March 17, 2017 9:18:31 AM Eastern Daylight Time

GL
 03/17/2017

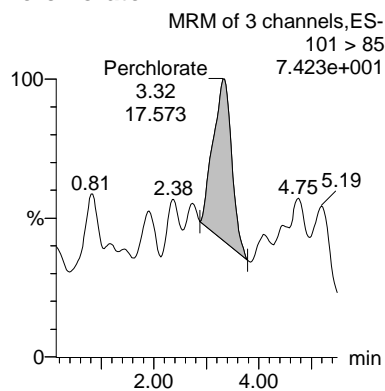
CWW
 03/17/2017

Name: per0316020a
Date: 16-Mar-2017
Time: 19:42:16
ID: IPB004
Vial: 1:1,A

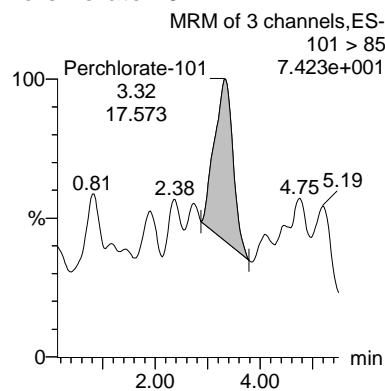
Perchlorate



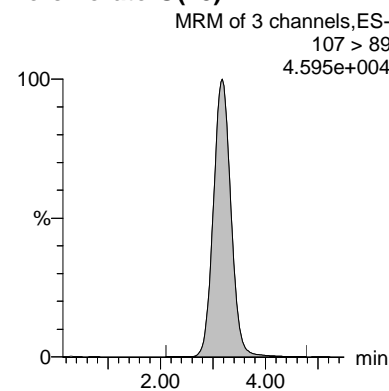
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB004	Perchlorate	99 > 83	3.21	38.088	0.001	bb			0.0010			4.887	2.17
IPB004	Perchlorate-101	101 > 85	3.32	17.573	0.000	bb			0.0014			6.084	
IPB004	Perchlorate-O(18)	107 > 89	3.18	17629.859	17629.859	bb			0.4797	95.94	-4.06	2827.4...	

Miscellaneous

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1648158 **Verified by:** _____
Analyst: Grace Cappelmann
Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203748893 MB	16-MAR-2017 15:30:00	10	10	1
1203748894 LCS	16-MAR-2017 15:30:00	10	10	1
1203748897 ICS	16-MAR-2017 15:30:00	10	10	1
418681001	16-MAR-2017 15:30:00	10	10	1
1203748895 MS (418681001)	16-MAR-2017 15:30:00	10	10	1
1203748896 MSD (418681001)	16-MAR-2017 15:30:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203748897	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161104-2.5-Ba/Ag/H
LCS	1203748894	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203748895	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203748896	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/16/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per031617a

Mobile Phase Lot#: 2523118, 2457559

Initial Calibration Date: 03/16/17

Standard-Samp Reagent Lot#:: 2457559

SOP: GL-OA-E-067

Alt Check Std. ID: WCL170306-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0316001a	IPB001	GXC1	3/16/2017 17:01			1		USE	B
per0316002a	IPB001	GXC1	3/16/2017 17:10			1		USE	B
per0316003a	WCLICAL-01	GXC1	3/16/2017 17:18			1		USE	I
per0316004a	WCLICAL-02	GXC1	3/16/2017 17:27			1		USE	I
per0316005a	WCLICAL-03	GXC1	3/16/2017 17:35			1		USE	I
per0316006a	WCLICAL-04	GXC1	3/16/2017 17:43			1		USE	I
per0316007a	WCLICAL-05	GXC1	3/16/2017 17:52			1		USE	I
per0316008a	WCLICAL-06	GXC1	3/16/2017 18:00			1		USE	I
per0316009a	IPB002	GXC1	3/16/2017 18:09			1		USE	B
per0316010a	WCLICV	GXC1	3/16/2017 18:17			1		USE	C
per0316011a	IPB003	GXC1	3/16/2017 18:26			1		USE	B
per0316012a	WCLCRI	GXC1	3/16/2017 18:34			1		USE	C
per0316013a	1203748893	GXC1	3/16/2017 18:43	1648159	418681	1	MBAC	USE	S
per0316014a	1203748894	GXC1	3/16/2017 18:51	1648159	418681	1	MBAC	USE	S
per0316015a	1203748897	GXC1	3/16/2017 19:00	1648159	418681	1	MBAC	USE	S
per0316016a	418681001	GXC1	3/16/2017 19:08	1648159	418681	2	MBAC	USE	S
per0316017a	1203748895	GXC1	3/16/2017 19:16	1648159	418681	2	MBAC	USE	S
per0316018a	1203748896	GXC1	3/16/2017 19:25	1648159	418681	2	MBAC	USE	S
per0316019a	WCLCCV	GXC1	3/16/2017 19:33			1		USE	C
per0316020a	IPB004	GXC1	3/16/2017 19:42			1		USE	B
per0316021a	WCLCRI	GXC1	3/16/2017 19:50			1		USE	C

DATA EXCEPTION REPORT			
Mo.Day Yr. 17-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1648159	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 418681			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. In 1203748895 (MS), a high recovery for Perchlorate was observed. The recovery was 147%. In 1203748896 (MSD), a high recovery of Perchlorate was also observed at 126%. The acceptance range of 75-125%.		1. The outliers observed for the matrix spikes may be due to the background concentration of the parent sample, 418681001 (LH18/24-SP650-6) and the need of a 1:2 dilution of all prior to analysis. Note, the recovery of Perchlorate in the batch LCS, 1203748894, was acceptable. Will report data and note in case narrative.	
Originator's Name: Grace Cappelmann 17-MAR-17		Data Validator/Group Leader: Charles Wilson 17-MAR-17	

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



March 30, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 418939

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 21, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Linda Pullano for
Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	45
Miscellaneous.....	64

Case Narrative

**Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 418939**

March 30, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 21, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

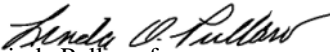
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
418939001	LH18/24-SP650-6425

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.


Linda Pullano for
Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY
4/18/17

Name Of Lab Shipping To: GEL Laboratories (843) 556-8171 ATTN: HOPE TAYLOR

Project: AECOM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.:
60256135.GWTPT
HRUMAR16

Job:
**GROUNDWATER TREATMENT PLANT
BI-WEEKLY SAMPLES**

Prepared By:
Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650-6425	Water	03/20/17 / 15:00		1	PERCHLORATE	NONE	

Additional Remarks: STANDARD TAT EMAIL RESULTS TO linda.raabe@aecom.com

Relinquished By: [Signature] Date: 03/20/17 Time: 15:30
Received By: Ashley [Signature] Date: 3/21/17 Time: 9:30

For Lab Use Only

Received At Lab By: _____ Date: _____ Time: _____
 Airbill No. _____ Date: _____ Time: _____
 Opened By: _____ Date: _____ Time: _____

Seal No. _____ Temp of Container _____ Condition _____

Remarks _____

(Word) S:\-ccs\Forms\Chain of Custody - BiWeekly



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: MBAC		SDG/AR/COC/Work Order: 418939	
Received By: AG		Date Received: 3/21/17	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other	
		J 457 939 2697	
Suspected Hazard Information		Yes	No
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Temperature Device Serial #: <u>1R2-17</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AG Date 3/21/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 30 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
Microbac Laboratories, Inc Kentucky Division (MBAC)
SDG #: 418939**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1651013

Prep Batch Number: 1651011

Sample Analysis

Sample ID	Client ID
418939001	418939001 (LH18/24-SP650-6425)
1203755639	Interference Check Sample (ICS)
1203755635	Method Blank (MB)
1203755636	Laboratory Control Sample (LCS)
1203755637	418938001(18WW08-032017) Matrix Spike (MS)
1203755638	418938001(18WW08-032017) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418938001 (18WW08-032017) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203755637 (MS) and 1203755638 (MSD) a 0% recovery of Perchlorate was observed. The acceptance range is 75-125%. The detected concentrations in the MS and MSD were lower than the detected concentration in the parent sample. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418938001 (18WW08-032017) and the need of a 1:5 dilution prior to analysis. 1203755637 (18WW08-032017MS) and 1203755638 (18WW08-032017MSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those

holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203755637 (18WW08-032017MS) and 1203755638 (18WW08-032017MSD) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

The entire batch was re-analyzed the following day due to the problems with the method blank. A detection of Perchlorate was observed just below our concentration of our low level standard. Upon the analysis of a new aliquot of method blank, the high detection was not confirmed. All samples were re-aliquot and re-analyzed. All QC requirements were met and all data could be reported.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1618609 was generated for samples 1203755637 (18WW08-032017MS) and 1203755638 (18WW08-032017MSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 418939 GEL Work Order: 418939

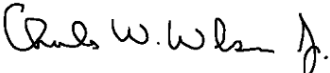
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 30 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6425

Date Received: 21-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 418939001

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.85	ug/L		1	28-MAR-17 21:19	per0328026a
	Perchlorate-O(18)			0.525	ug/L		1	28-MAR-17 21:19	per0328026a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 418939

Extract Batch Code: 1651011

Date Filtered: 27-MAR-17

Matrix: WATER

Sample ID: 1203755636

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.196	ug/L	98		85 - 115
Perchlorate-O(18)		.5	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 418939Extract Batch Code: 1651011Date Filtered: 27-MAR-17Matrix: WATERSample ID: 1203755639

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	106		70 - 130
Perchlorate-O(18)		.506	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 418939Extract Batch Code: 1651011Date Extracted: 27-MAR-17GEL MS/PS ID: 1203755637Client ID: 18WW08-032017GEL MSD/PSD ID: 1203755638QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	7.72	ug/L	7.46	0 *	7.45	0 *	0	30	75 - 125
Perchlorate-O(18)	0	2.41	ug/L	2.49		2.45		2		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0328006a	28-MAR-17	15530.6				
Lower Area Limit			7765.3				
Upper Area Limit			23295.9				
1203755635	per0328013a	28-MAR-17 19:16	15097.5	4.09	4.06102	.993	
1203755636	per0328014a	28-MAR-17 19:25	15400.2	4.06	4.08867	1.007	
1203755639	per0328015a	28-MAR-17 19:35	15579.7	4.06	4.08867	1.007	
1203755637	per0328017a	28-MAR-17 19:54	15340.7	4.03	4.08867	1.015	
1203755638	per0328018a	28-MAR-17 20:03	15112	4.06	4.08867	1.007	
418939001	per0328026a	28-MAR-17 21:19	16167.3	3.98	4.00585	1.006	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6425

Date Received: 21-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 418939001

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.85	ug/L		1	28-MAR-17 21:19	per0328026a
	Perchlorate-O(18)			0.525	ug/L		1	28-MAR-17 21:19	per0328026a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

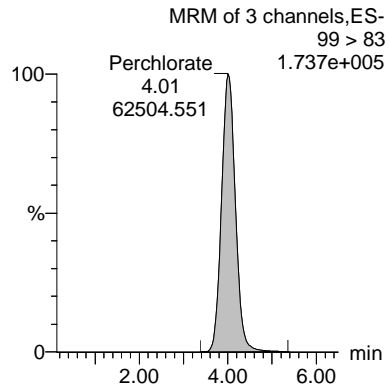
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

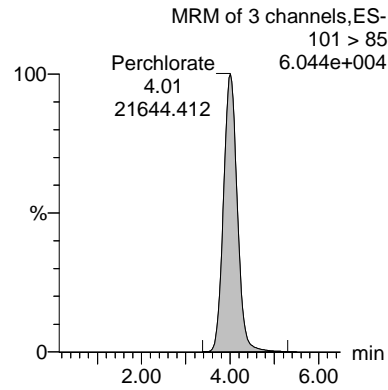
CWW
 03/30/2017

Name: per0328026a
Date: 28-Mar-2017
Time: 21:19:17
ID: 418939001
Vial: 1:4,E

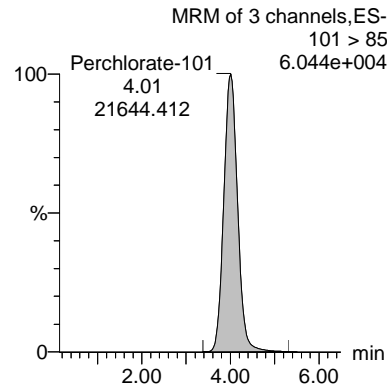
Perchlorate



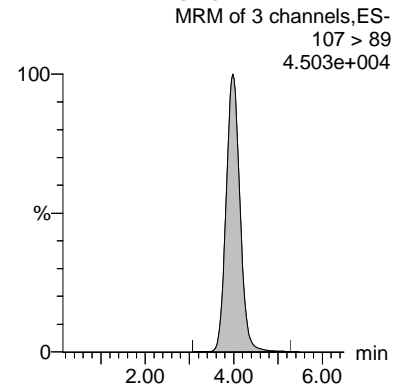
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
418939001	Perchlorate	99 > 83	4.01	62504.551	1.933	bb			1.8471			13250.... 2.89
418939001	Perchlorate-101	101 > 85	4.01	21644.412	0.669	bb			1.8957			5036.0...
418939001	Perchlorate-O(18)	107 > 89	3.98	16167.292	16167.292	bb			0.5252	105.04	5.04	4107.4...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 418939

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 28-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate

Coefficient of Determination: .

Calibration Curve: 1.04667

Response Type: Internal Standard

Curve Type: RF

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 28-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .35333Response Type: Internal StandardCurve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld

GL
03/29/2017CW
03/30/2017

Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time

Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per032817a.mdb 28 Mar 2017 15:32:39**Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per032817a.cdb 29 Mar 2017 09:31:28**

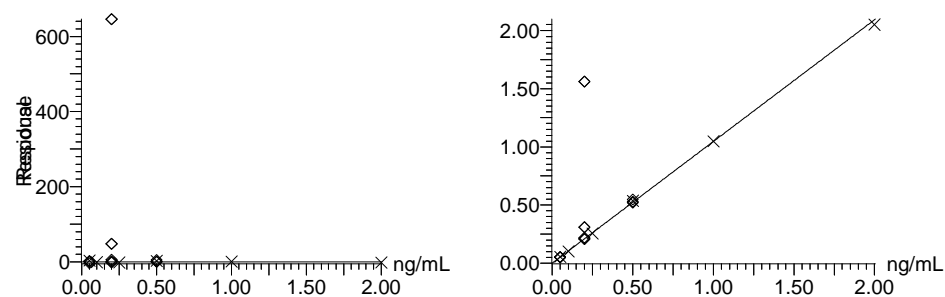
Compound name: Perchlorate

Response Factor: 1.04651

RRF SD: 0.023016, % Relative SD: 2.19931

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



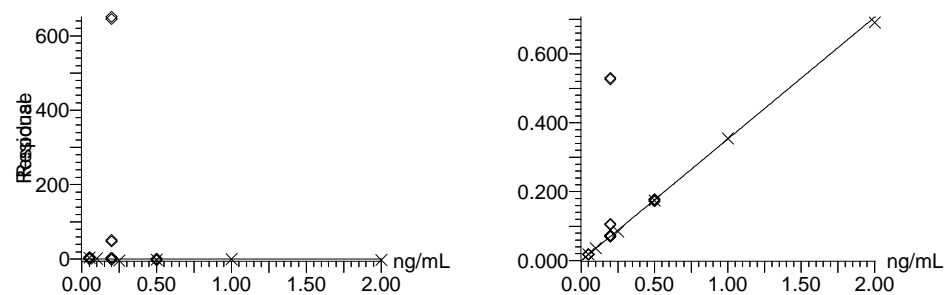
Compound name: Perchlorate-101

Response Factor: 0.353102

RRF SD: 0.0106439, % Relative SD: 3.0144

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld

Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time

Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

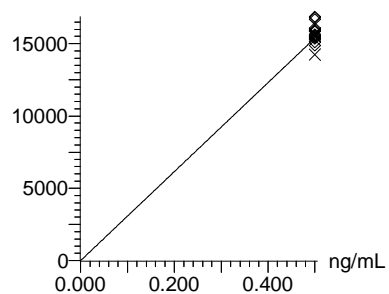
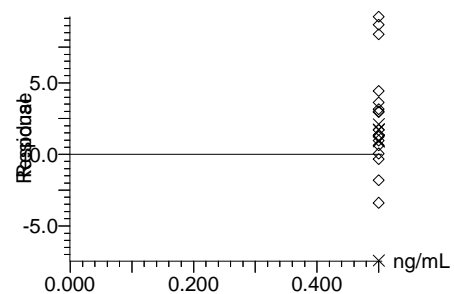
Compound name: Perchlorate-O(18)

Response Factor: 30783

RRF SD: 1128.79, % Relative SD: 3.66692

Response type: External Std, Area

Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

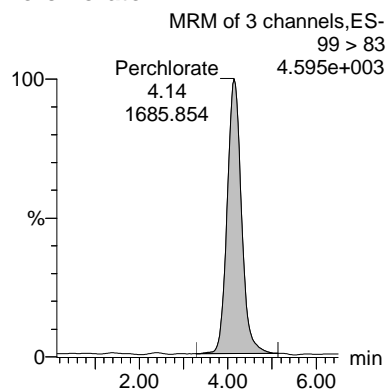
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

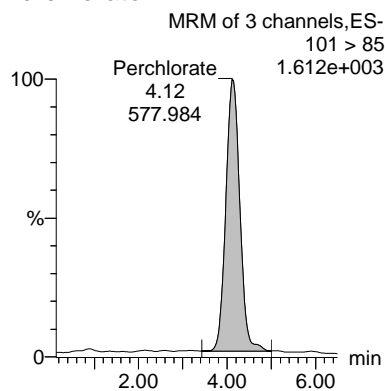
CWW
 03/30/2017

Name: per0328003a
Date: 28-Mar-2017
Time: 17:41:40
ID: WCL170320-01
Vial: 1:1,B

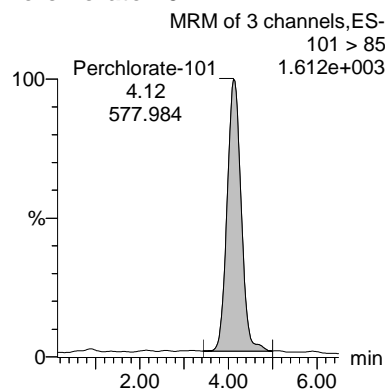
Perchlorate



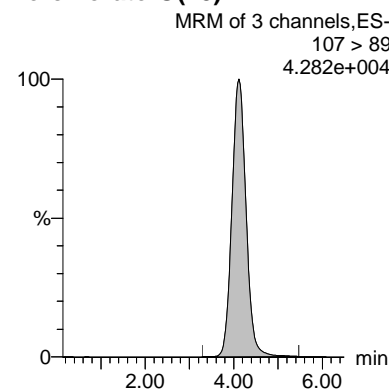
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-01	Perchlorate	99 > 83	4.14	1685.854	0.054	bb			0.0514	102.87	2.87	264.540	2.92
WCL170320-01	Perchlorate-101	101 > 85	4.12	577.984	0.018	bb			0.0523	104.52	4.52	181.765	
WCL170320-01	Perchlorate-O(18)	107 > 89	4.12	15660.600	15660.600	bb			0.5087	101.75	1.75	4034.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

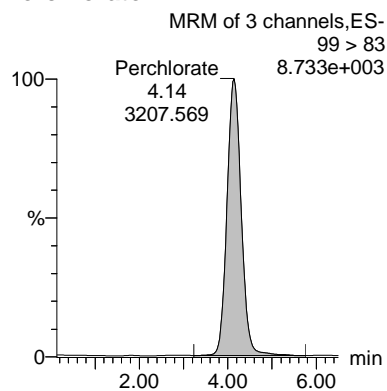
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

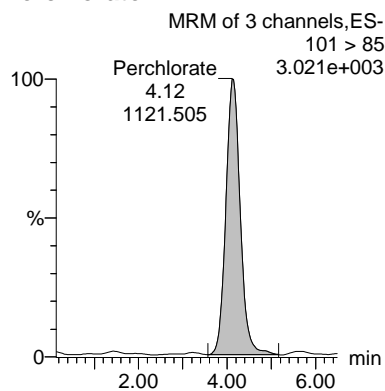
CWW
 03/30/2017

Name: per0328004a
Date: 28-Mar-2017
Time: 17:51:08
ID: WCL170320-02
Vial: 1:1,C

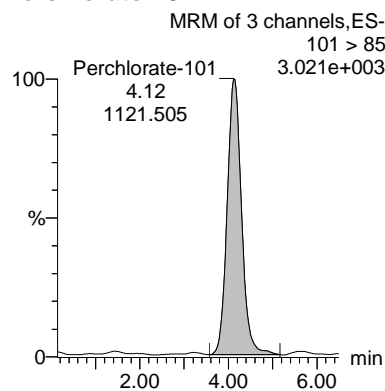
Perchlorate



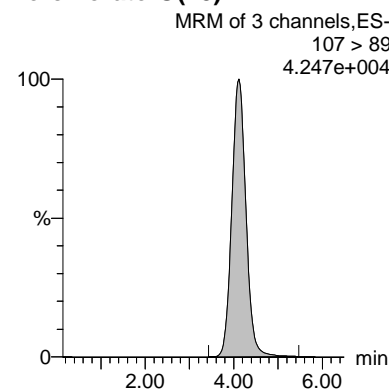
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-02	Perchlorate	99 > 83	4.14	3207.569	0.103	bb			0.0986	98.61	-1.39	1722.6...	2.86
WCL170320-02	Perchlorate-101	101 > 85	4.12	1121.505	0.036	bb			0.1022	102.18	2.18	237.467	
WCL170320-02	Perchlorate-O(18)	107 > 89	4.12	15541.402	15541.402	bb			0.5049	100.97	0.97	3529.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

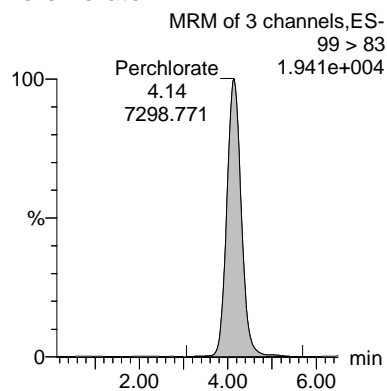
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

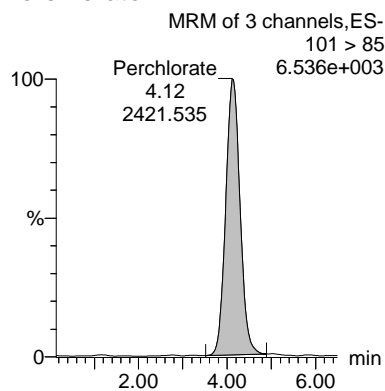
CWW
 03/30/2017

Name: per0328005a
Date: 28-Mar-2017
Time: 18:00:35
ID: WCL170320-03
Vial: 1:1,D

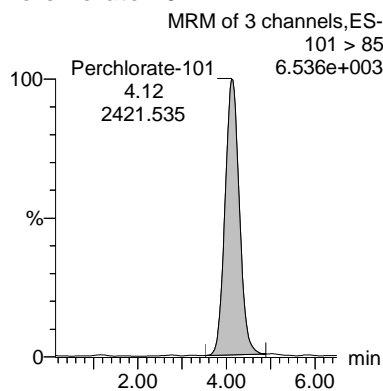
Perchlorate



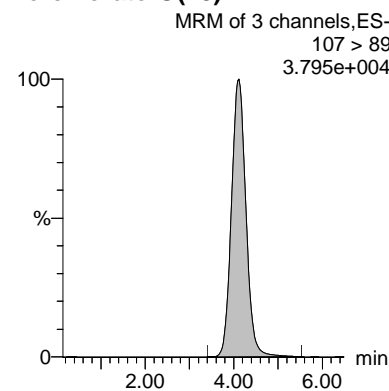
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-03	Perchlorate	99 > 83	4.14	7298.771	0.256	bb			0.2447	97.89	-2.11	625.719	3.01
WCL170320-03	Perchlorate-101	101 > 85	4.12	2421.535	0.085	bb			0.2406	96.26	-3.74	435.045	
WCL170320-03	Perchlorate-O(18)	107 > 89	4.12	14248.785	14248.785	bb			0.4629	92.58	-7.42	2410.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

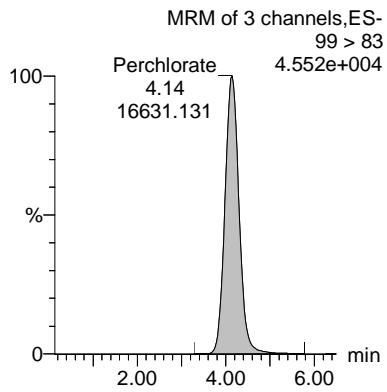
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

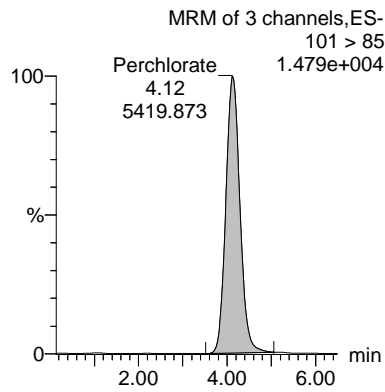
CWW
 03/30/2017

Name: per0328006a
Date: 28-Mar-2017
Time: 18:10:02
ID: WCL170320-04
Vial: 1:1,E

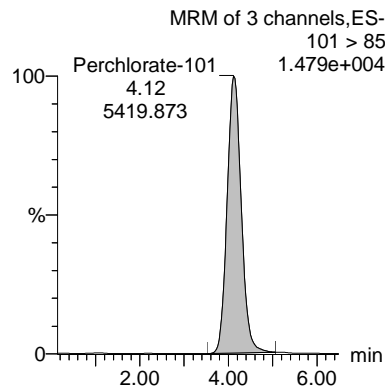
Perchlorate



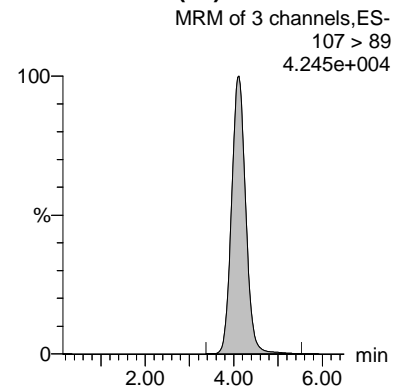
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-04	Perchlorate	99 > 83	4.14	16631.131	0.535	bb			0.5116	102.33	2.33	2542.8...	3.07
WCL170320-04	Perchlorate-101	101 > 85	4.12	5419.873	0.174	bb			0.4942	98.83	-1.17	1419.4...	
WCL170320-04	Perchlorate-O(18)	107 > 89	4.12	15530.634	15530.634	bb			0.5045	100.90	0.90	6433.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

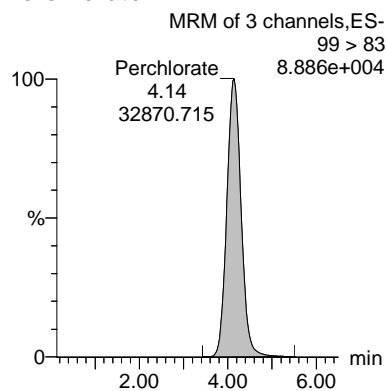
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

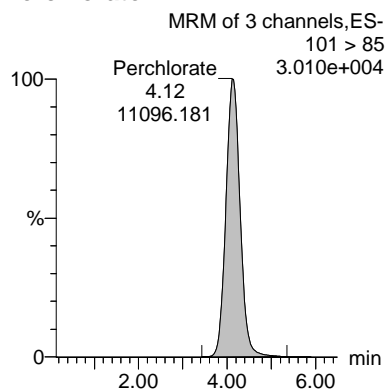
CW
 03/30/2017

Name: per0328007a
Date: 28-Mar-2017
Time: 18:19:29
ID: WCL170320-05
Vial: 1:1,F

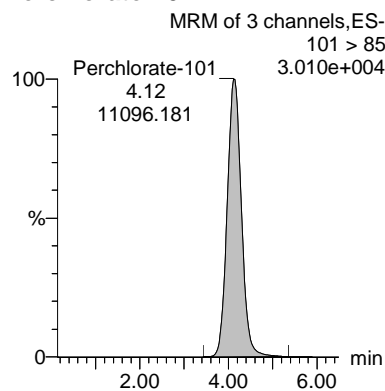
Perchlorate



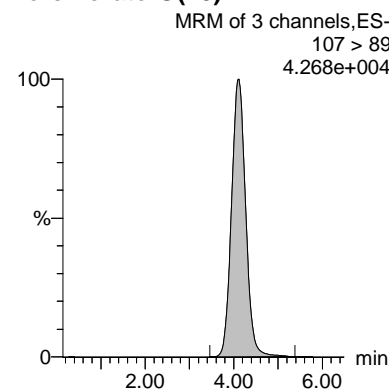
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-05	Perchlorate	99 > 83	4.14	32870.715	1.050	bb			1.0033	100.33	0.33	5946.6...	2.96
WCL170320-05	Perchlorate-101	101 > 85	4.12	11096.181	0.354	bb			1.0038	100.38	0.38	4116.1...	
WCL170320-05	Perchlorate-O(18)	107 > 89	4.12	15653.696	15653.696	bb			0.5085	101.70	1.70	1806.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

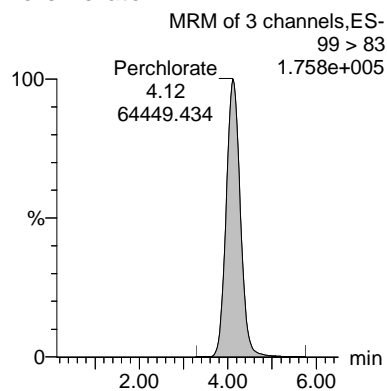
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

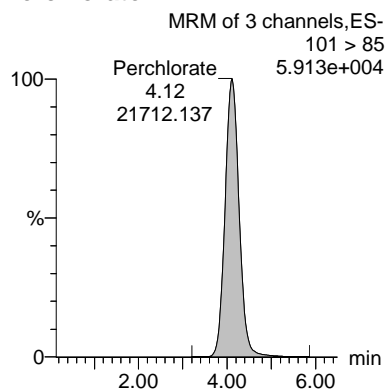
CWW
 03/30/2017

Name: per0328008a
Date: 28-Mar-2017
Time: 18:28:55
ID: WCL170320-06
Vial: 1:2,A

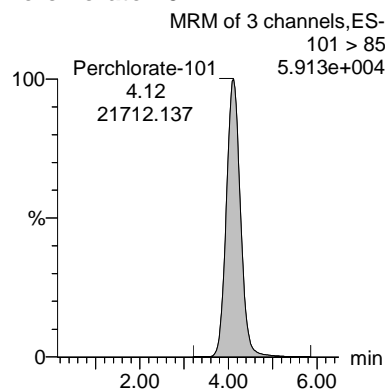
Perchlorate



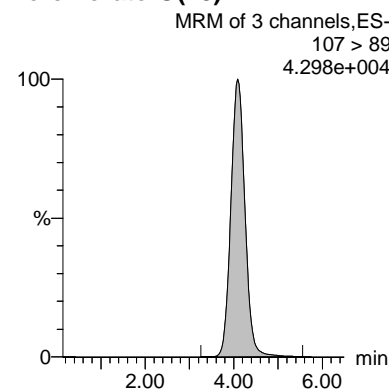
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-06	Perchlorate	99 > 83	4.12	64449.434	2.051	bb			1.9596	97.98	-2.02	11932....	2.97
WCL170320-06	Perchlorate-101	101 > 85	4.12	21712.137	0.691	bb			1.9565	97.83	-2.17	2202.0...	
WCL170320-06	Perchlorate-O(18)	107 > 89	4.09	15713.861	15713.861	bb			0.5105	102.09	2.09	5310.3...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.5	99.53	28-MAR-17 18:47	per0328010a
Perchlorate Isotope Ratio		2.92		28-MAR-17 18:47	per0328010a
Perchlorate-101	.5	.51	101.04	28-MAR-17 18:47	per0328010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

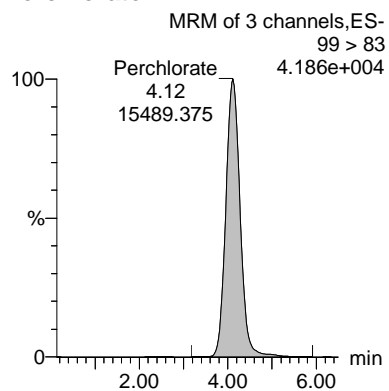
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

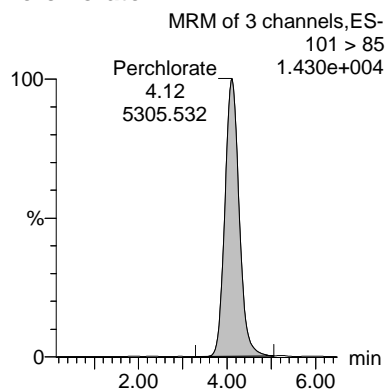
CWW
 03/30/2017

Name: per0328010a
Date: 28-Mar-2017
Time: 18:47:51
ID: WCL170320-07ICV
Vial: 1:2,B

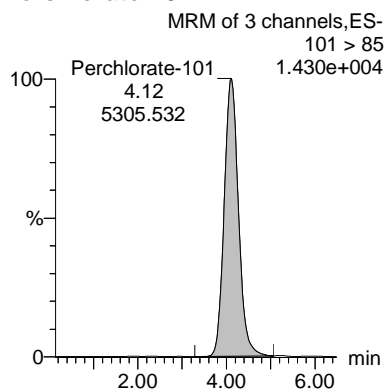
Perchlorate



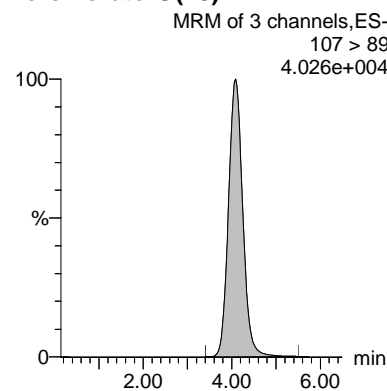
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07ICV	Perchlorate	99 > 83	4.12	15489.375	0.521	bb			0.4977	99.53	-0.47	3353.3...	2.92
WCL170320-07ICV	Perchlorate-101	101 > 85	4.12	5305.532	0.178	bb			0.5052	101.04	1.04	1142.2...	
WCL170320-07ICV	Perchlorate-O(18)	107 > 89	4.09	14870.273	14870.273	bb			0.4831	96.61	-3.39	590.627	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.52	104.31	28-MAR-17 20:50	per0328023a
Perchlorate Isotope Ratio		3.13		28-MAR-17 20:50	per0328023a
Perchlorate-101	.5	.49	98.81	28-MAR-17 20:50	per0328023a
Perchlorate	.5	.5	100.49	28-MAR-17 22:53	per0328036a
Perchlorate Isotope Ratio		3.06		28-MAR-17 22:53	per0328036a
Perchlorate-101	.5	.49	97.34	28-MAR-17 22:53	per0328036a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

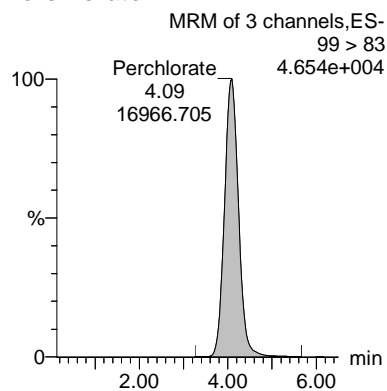
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

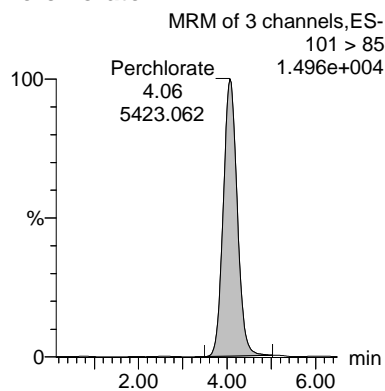
CWW
 03/30/2017

Name: per0328023a
Date: 28-Mar-2017
Time: 20:50:53
ID: WCL170320-07CCV
Vial: 1:2,B

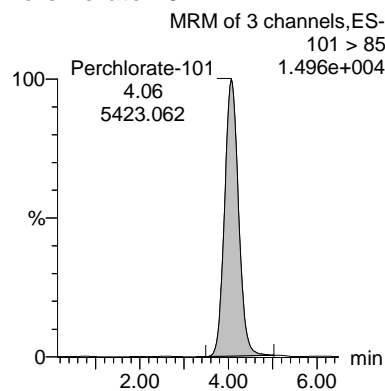
Perchlorate



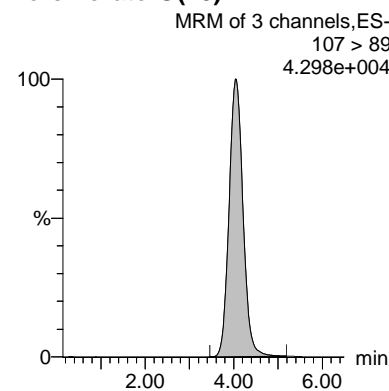
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	4.09	16966.705	0.546	bb			0.5215	104.31	4.31	3293.1...	3.13
WCL170320-07CCV	Perchlorate-101	101 > 85	4.06	5423.062	0.174	bb			0.4941	98.81	-1.19	664.482	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	4.03	15543.203	15543.203	bb			0.5049	100.99	0.99	4090.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

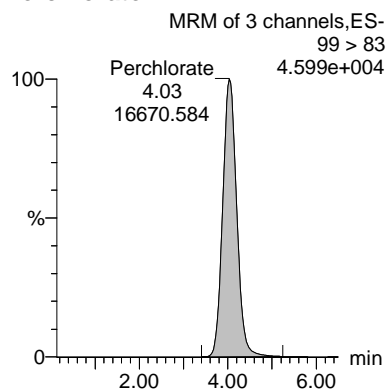
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

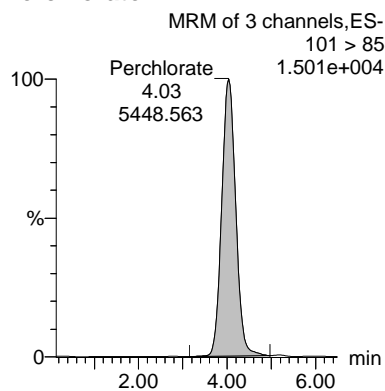
CWW
 03/30/2017

Name: per0328036a
Date: 28-Mar-2017
Time: 22:53:59
ID: WCL170320-07CCV
Vial: 1:2,B

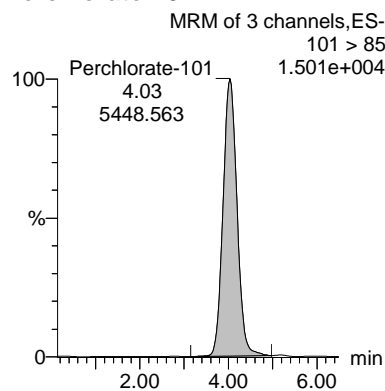
Perchlorate



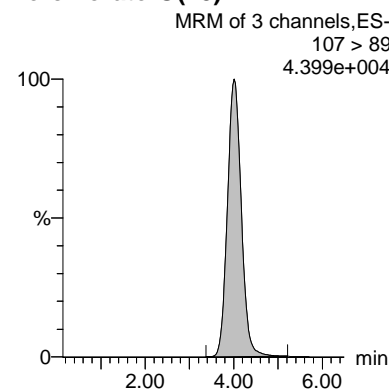
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	4.03	16670.584	0.526	bb			0.5025	100.49	0.49	3325.0...	3.06
WCL170320-07CCV	Perchlorate-101	101 > 85	4.03	5448.563	0.172	bb			0.4867	97.34	-2.66	781.536	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	4.01	15851.859	15851.859	bb			0.5150	102.99	2.99	2720.8...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	100.74	28-MAR-17 19:06	per0328012a
Perchlorate Isotope Ratio		2.81		28-MAR-17 19:06	per0328012a
Perchlorate-101	.05	.05	106.07	28-MAR-17 19:06	per0328012a
Perchlorate	.05	.05	101.79	28-MAR-17 21:09	per0328025a
Perchlorate Isotope Ratio		2.94		28-MAR-17 21:09	per0328025a
Perchlorate-101	.05	.05	102.48	28-MAR-17 21:09	per0328025a
Perchlorate	.05	.05	96.48	28-MAR-17 23:12	per0328038a
Perchlorate Isotope Ratio		2.84		28-MAR-17 23:12	per0328038a
Perchlorate-101	.05	.05	100.64	28-MAR-17 23:12	per0328038a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

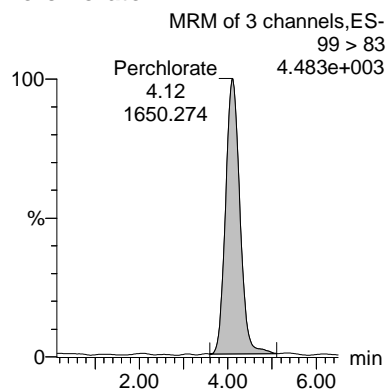
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

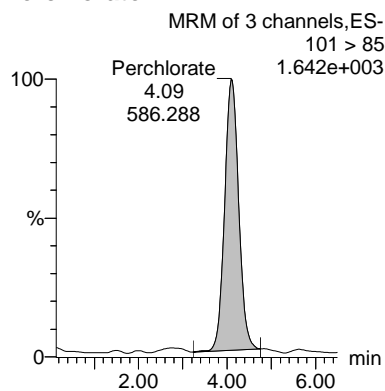
CWW
 03/30/2017

Name: per0328012a
Date: 28-Mar-2017
Time: 19:06:45
ID: WCL170320-08CRI
Vial: 1:2,C

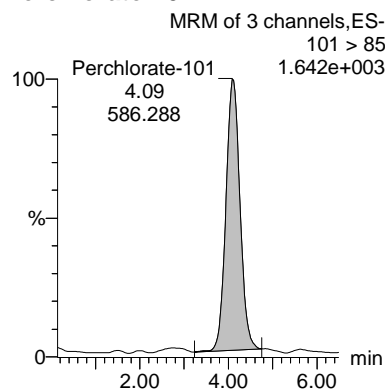
Perchlorate



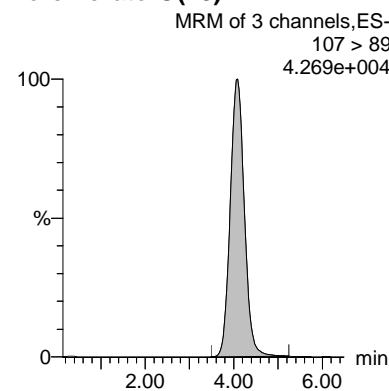
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.12	1650.274	0.053	bb			0.0504	100.74	0.74	501.890	2.81
WCL170320-08CRI	Perchlorate-101	101 > 85	4.09	586.288	0.019	bb			0.0530	106.07	6.07	100.665	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.09	15653.307	15653.307	bb			0.5085	101.70	1.70	3864.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

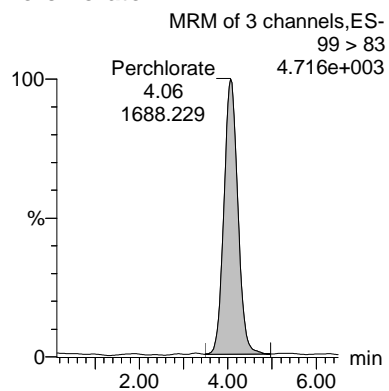
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

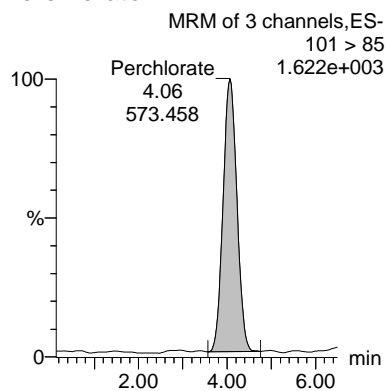
CWW
 03/30/2017

Name: per0328025a
Date: 28-Mar-2017
Time: 21:09:49
ID: WCL170320-08CRI
Vial: 1:2,C

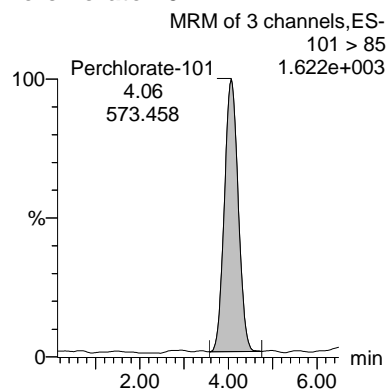
Perchlorate



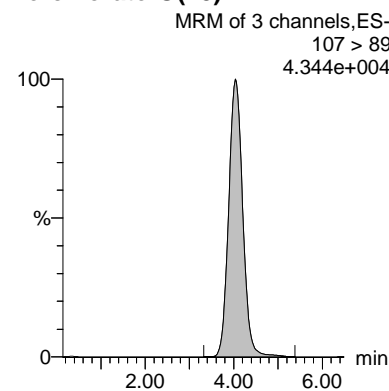
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.06	1688.229	0.053	bb			0.0509	101.79	1.79	528.091	2.94
WCL170320-08CRI	Perchlorate-101	101 > 85	4.06	573.458	0.018	bb			0.0512	102.48	2.48	184.648	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.03	15847.729	15847.729	bb			0.5148	102.96	2.96	1672.2...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

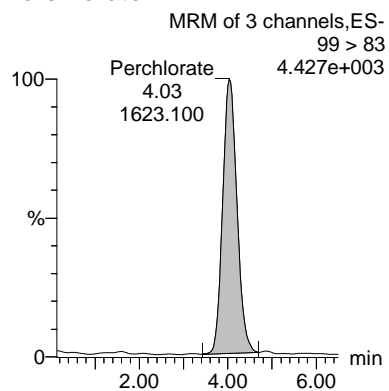
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

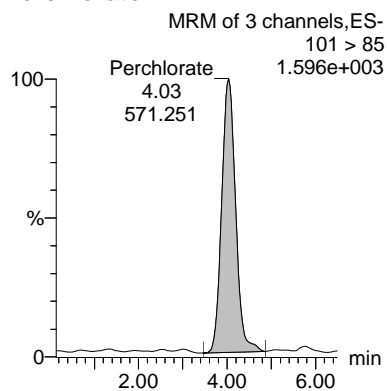
CWW
 03/30/2017

Name: per0328038a
Date: 28-Mar-2017
Time: 23:12:54
ID: WCL170320-08CRI
Vial: 1:2,C

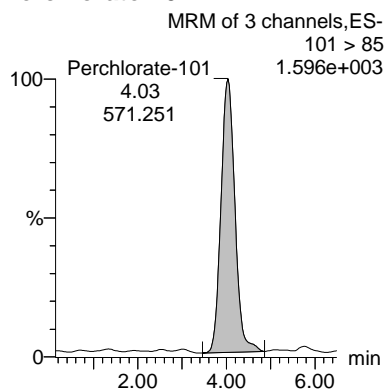
Perchlorate



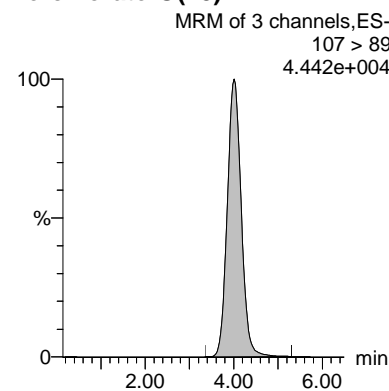
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.03	1623.100	0.050	bb			0.0482	96.48	-3.52	261.661	2.84
WCL170320-08CRI	Perchlorate-101	101 > 85	4.03	571.251	0.018	bb			0.0503	100.64	0.64	148.788	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.01	16075.658	16075.658	bb			0.5222	104.45	4.45	2606.2...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

MB

Date Received: 27-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 1203755635

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	28-MAR-17 19:16	per0328013a
	Perchlorate-O(18)			0.490	ug/L		1	28-MAR-17 19:16	per0328013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

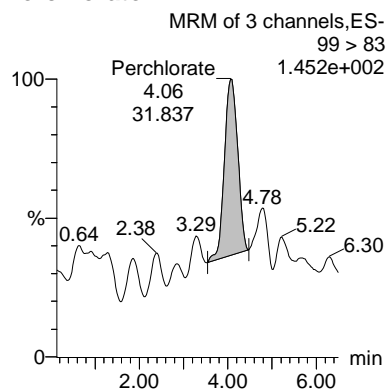
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

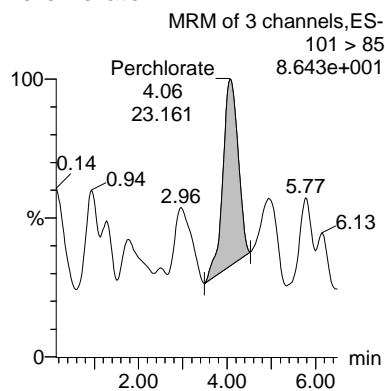
CWW
 03/30/2017

Name: per0328013a
Date: 28-Mar-2017
Time: 19:16:12
ID: 1203755635
Vial: 1:3,A

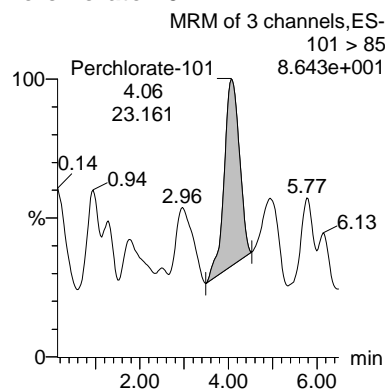
Perchlorate



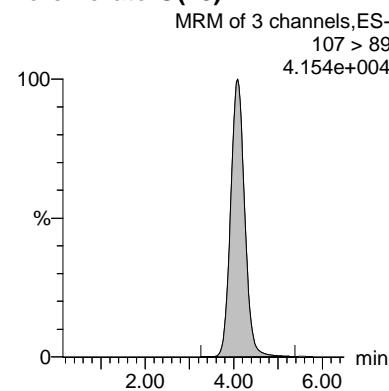
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203755635	Perchlorate	99 > 83	4.06	31.837	0.001	bb			0.0010			6.229 1.37
1203755635	Perchlorate-101	101 > 85	4.06	23.161	0.001	bb			0.0022			1.948
1203755635	Perchlorate-O(18)	107 > 89	4.09	15097.521	15097.521	bb			0.4905	98.09	-1.91	1465.2...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 27-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 1203755636

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.196	ug/L	J	1	28-MAR-17 19:25	per0328014a
	Perchlorate-O(18)			0.500	ug/L		1	28-MAR-17 19:25	per0328014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

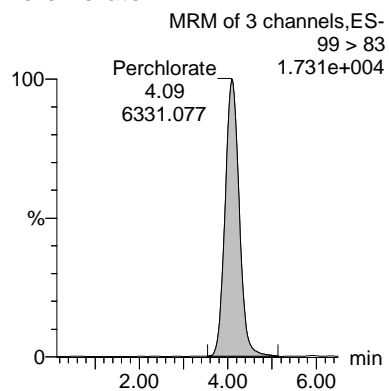
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

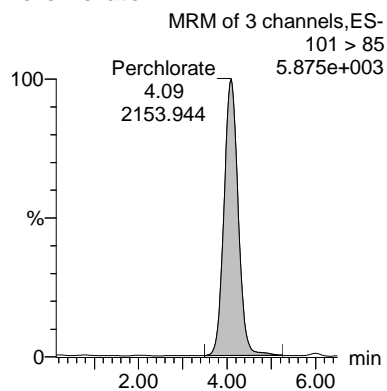
CWW
 03/30/2017

Name: per0328014a
Date: 28-Mar-2017
Time: 19:25:41
ID: 1203755636
Vial: 1:3,B

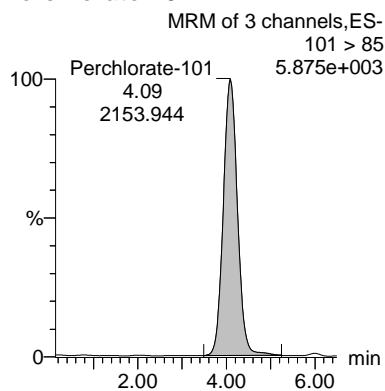
Perchlorate



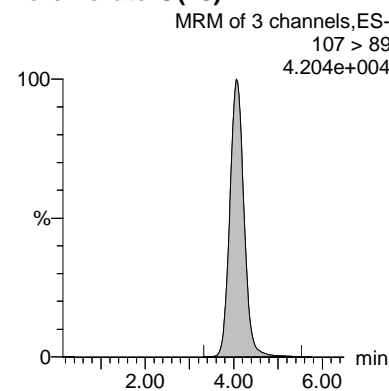
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755636	Perchlorate	99 > 83	4.09	6331.077	0.206	bb			0.1964	98.21	-1.79	710.715	2.94
1203755636	Perchlorate-101	101 > 85	4.09	2153.944	0.070	bb			0.1981	99.03	-0.97	363.928	
1203755636	Perchlorate-O(18)	107 > 89	4.06	15400.181	15400.181	bb			0.5003	100.06	0.06	3437.1...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 418939

GEL Sample ID: 1203755639

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.211	ug/L		1	28-MAR-17 19:35	per0328015a
	Perchlorate-O(18)			0.506	ug/L		1	28-MAR-17 19:35	per0328015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

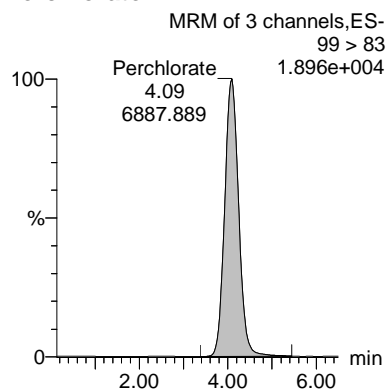
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

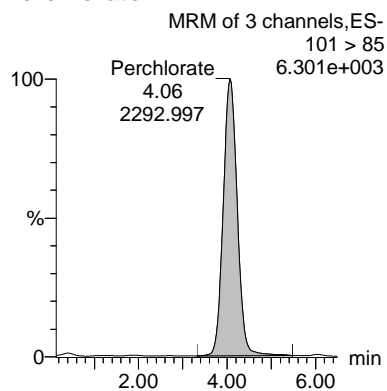
CWW
 03/30/2017

Name: per0328015a
Date: 28-Mar-2017
Time: 19:35:09
ID: 1203755639
Vial: 1:3,C

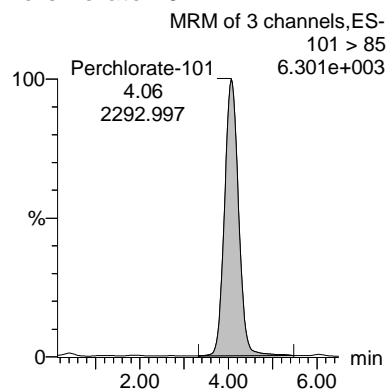
Perchlorate



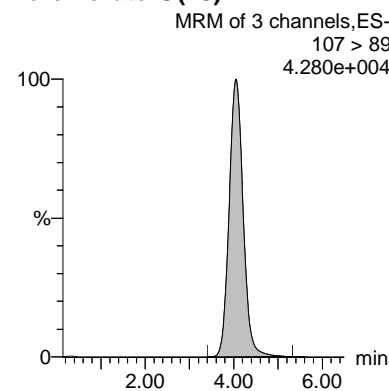
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755639	Perchlorate	99 > 83	4.09	6887.889	0.221	bb			0.2112	105.61	5.61	3146.6...	3.00
1203755639	Perchlorate-101	101 > 85	4.06	2292.997	0.074	bb			0.2084	104.20	4.20	516.199	
1203755639	Perchlorate-O(18)	107 > 89	4.06	15579.710	15579.710	bb			0.5061	101.22	1.22	3501.5...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

18WW08-032017MS

Date Received: 21-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 1203755637

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	7.46	ug/L		5	28-MAR-17 19:54	per0328017a
	Perchlorate-O(18)			2.49	ug/L		5	28-MAR-17 19:54	per0328017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

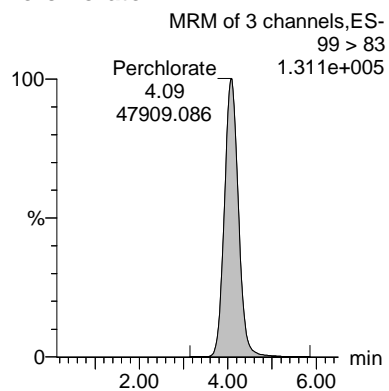
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

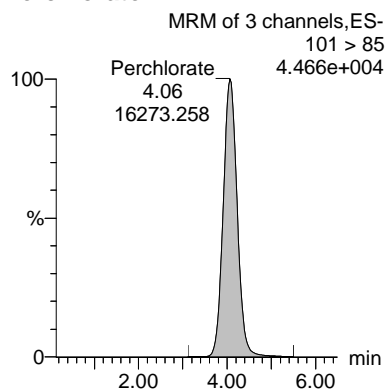
CWW
 03/30/2017

Name: per0328017a
Date: 28-Mar-2017
Time: 19:54:05
ID: 1203755637
Vial: 1:3,E

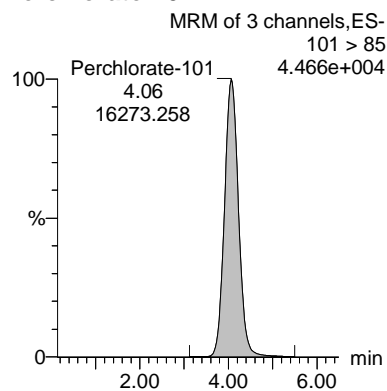
Perchlorate



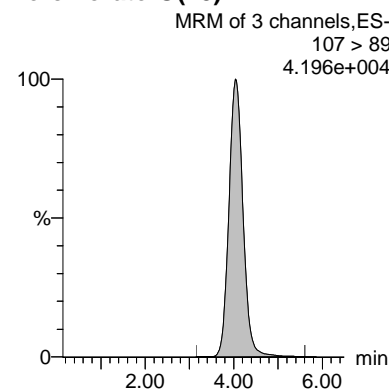
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755637	Perchlorate	99 > 83	4.09	47909.086	1.562	bb			1.4921	746.05	646.05	11634....	2.94
1203755637	Perchlorate-101	101 > 85	4.06	16273.258	0.530	bb			1.5021	751.05	651.05	1548.0...	
1203755637	Perchlorate-O(18)	107 > 89	4.03	15340.698	15340.698	bb			0.4983	99.67	-0.33	2750.6...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

18WW08-032017MSD

Date Received: 21-MAR-17

GEL Job No (SDG): 418939

GEL Sample ID: 1203755638

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	7.45	ug/L		5	28-MAR-17 20:03	per0328018a
	Perchlorate-O(18)			2.45	ug/L		5	28-MAR-17 20:03	per0328018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

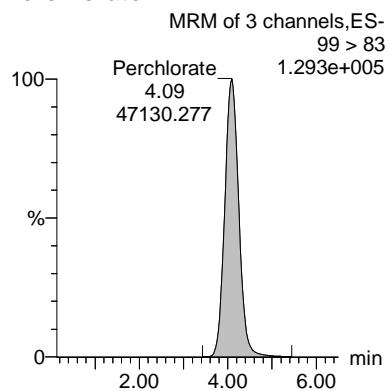
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

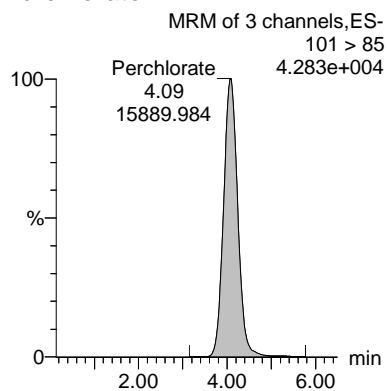
CWW
 03/30/2017

Name: per0328018a
Date: 28-Mar-2017
Time: 20:03:33
ID: 1203755638
Vial: 1:3,F

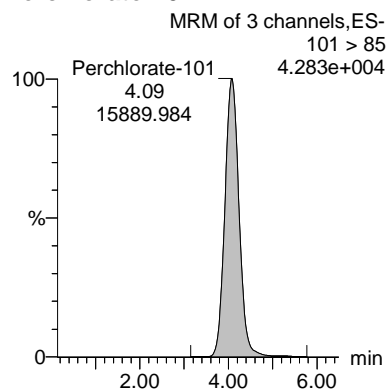
Perchlorate



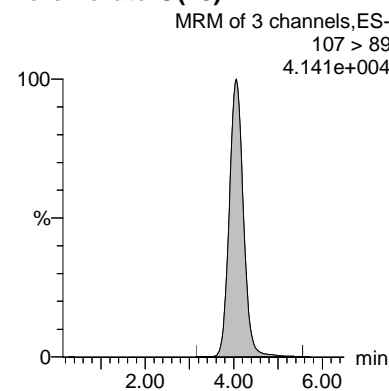
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755638	Perchlorate	99 > 83	4.09	47130.277	1.559	bb			1.4901	745.03	645.03	4484.3...	2.97
1203755638	Perchlorate-101	101 > 85	4.09	15889.984	0.526	bb			1.4889	744.46	644.46	3362.7...	
1203755638	Perchlorate-O(18)	107 > 89	4.06	15111.959	15111.959	bb			0.4909	98.18	-1.82	5667.8...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	28-MAR-17	per0328001a	IPB001
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328001a	IPB001
Perchlorate	0.00	0	NA	28-MAR-17	per0328002a	IPB001
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
 Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
 Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

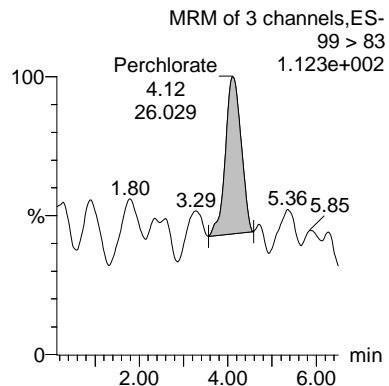
GL
 03/29/2017

CWW
 03/30/2017

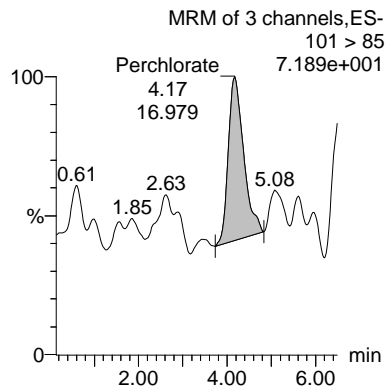
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per032817a.mdb 28 Mar 2017 15:32:39
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per032817a.cdb 29 Mar 2017 09:31:28

Name: per0328001a
 Date: 28-Mar-2017
 Time: 17:22:40
 ID: IPB001
 Vial: 1:1,A

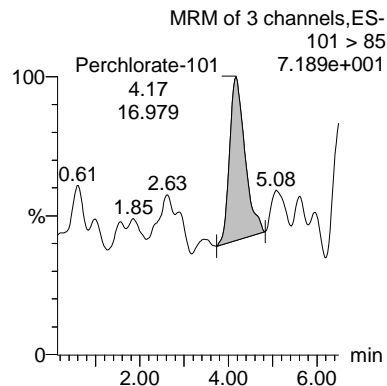
Perchlorate



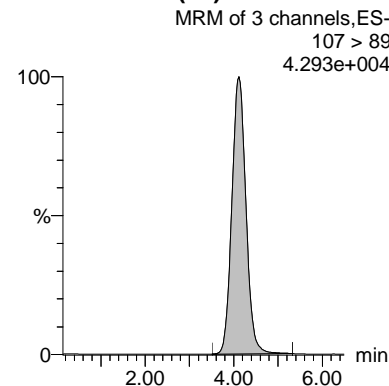
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	4.12	26.029	0.001	bb			0.0008			5.733 1.53
IPB001	Perchlorate-101	101 > 85	4.17	16.979	0.001	bb			0.0015			8.208
IPB001	Perchlorate-O(18)	107 > 89	4.12	15705.856	15705.856	bb			0.5102	102.04	2.04	1516.2...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

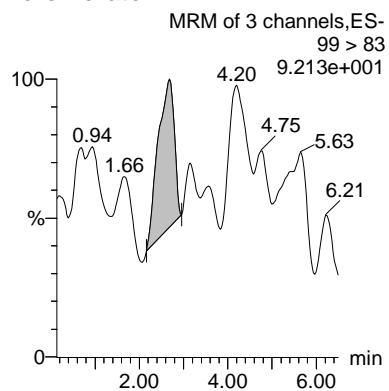
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

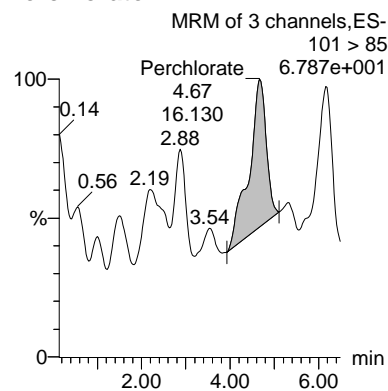
CWJ
 03/30/2017

Name: per0328002a
Date: 28-Mar-2017
Time: 17:32:12
ID: IPB001
Vial: 1:1,A

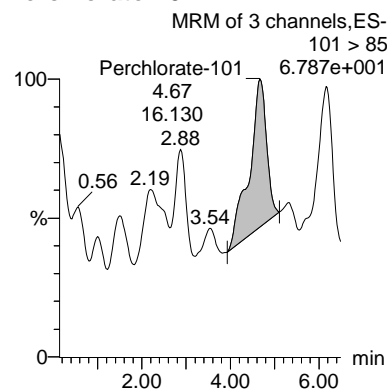
Perchlorate



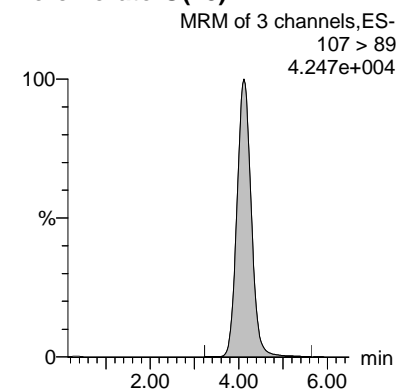
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	2.68	21.127	0.001	bb			0.0006			2.053 1.31
IPB001	Perchlorate-101	101 > 85	4.67	16.130	0.001	bb			0.0015			4.395
IPB001	Perchlorate-O(18)	107 > 89	4.12	15721.755	15721.755	bb			0.5107	102.15	2.15	1755.5...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 418939Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	28-MAR-17	per0328009a	IPB002
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328009a	IPB002
Perchlorate	0.00	0	NA	28-MAR-17	per0328011a	IPB003
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328011a	IPB003
Perchlorate	0.00	0	NA	28-MAR-17	per0328024a	IPB004
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328024a	IPB004
Perchlorate	0.00	0	NA	28-MAR-17	per0328037a	IPB005
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328037a	IPB005

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

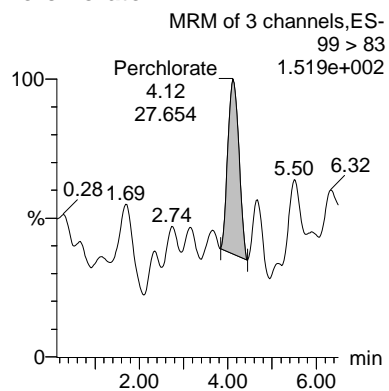
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

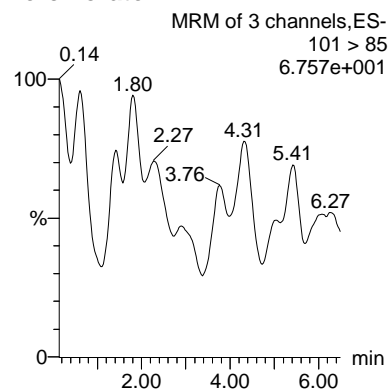
CW
 03/30/2017

Name: per0328009a
Date: 28-Mar-2017
Time: 18:38:23
ID: IPB002
Vial: 1:1,A

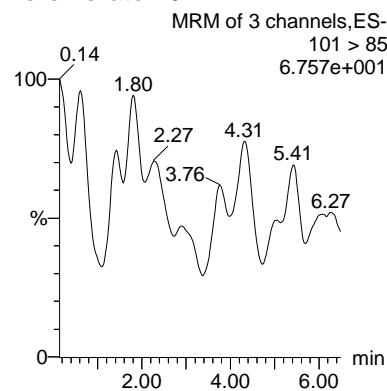
Perchlorate



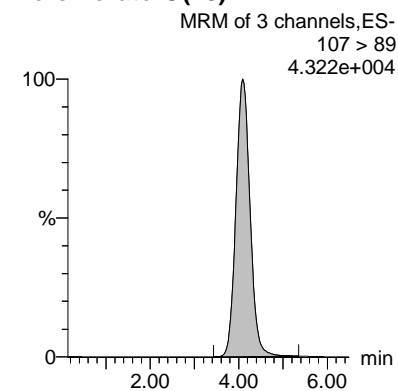
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB002	Perchlorate	99 > 83	4.12	27.654	0.001	bb			0.0008			5.988	0.00
IPB002	Perchlorate-101	101 > 85											
IPB002	Perchlorate-O(18)	107 > 89	4.09	15841.096	15841.096	bb			0.5146	102.92	2.92	2561.1...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

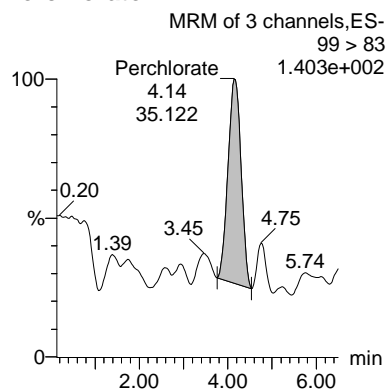
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

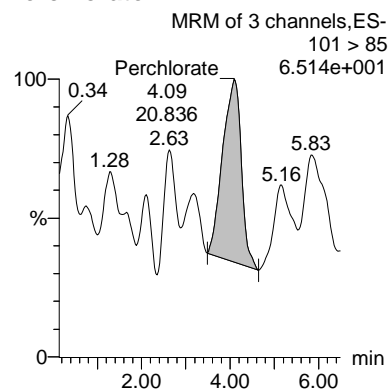
CWW
 03/30/2017

Name: per0328011a
Date: 28-Mar-2017
Time: 18:57:18
ID: IPB003
Vial: 1:1,A

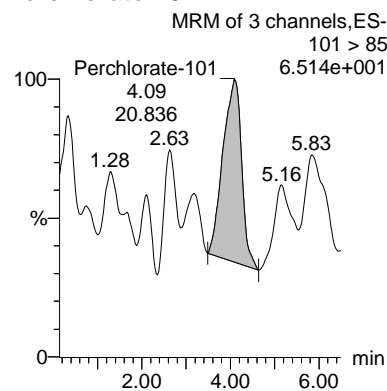
Perchlorate



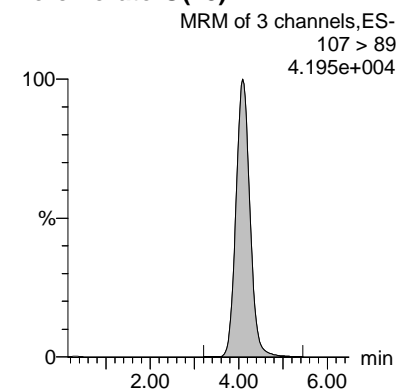
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	4.14	35.122	0.001	bb			0.0011			7.519 1.69
IPB003	Perchlorate-101	101 > 85	4.09	20.836	0.001	bb			0.0019			6.259
IPB003	Perchlorate-O(18)	107 > 89	4.09	15253.137	15253.137	bb			0.4955	99.10	-0.90	1904.9...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

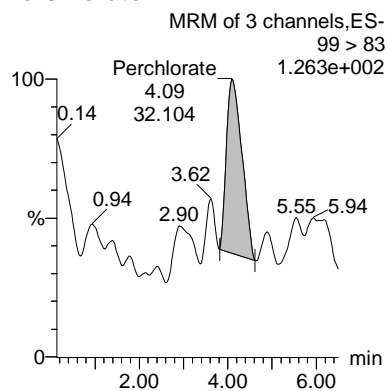
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

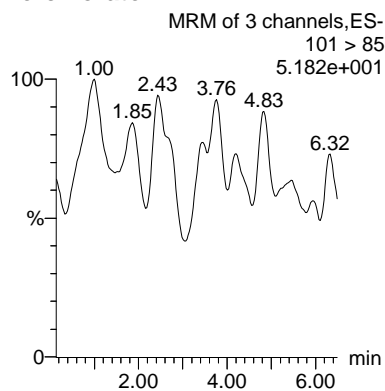
CWW
 03/30/2017

Name: per0328024a
Date: 28-Mar-2017
Time: 21:00:21
ID: IPB004
Vial: 1:1,A

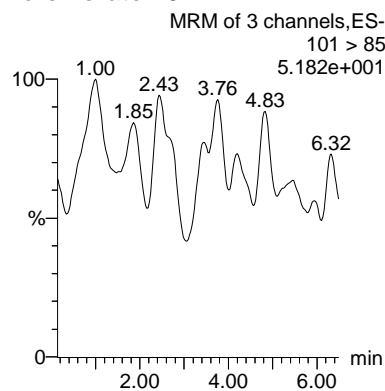
Perchlorate



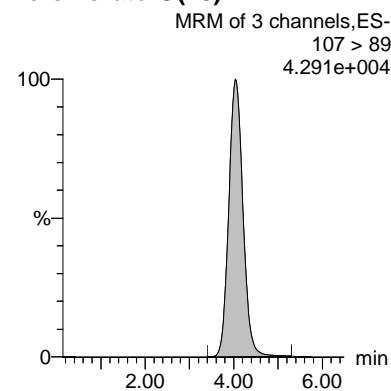
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB004	Perchlorate	99 > 83	4.09	32.104	0.001	bb			0.0010			7.179 0.00
IPB004	Perchlorate-101	101 > 85										
IPB004	Perchlorate-O(18)	107 > 89	4.03	15784.369	15784.369	bb			0.5128	102.55	2.55	2586.5...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

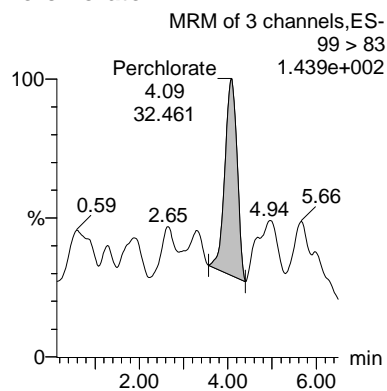
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

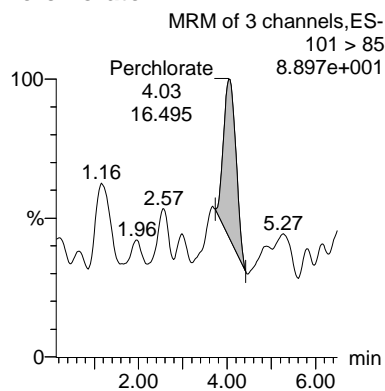
CWW
 03/30/2017

Name: per0328037a
Date: 28-Mar-2017
Time: 23:03:27
ID: IPB005
Vial: 1:1,A

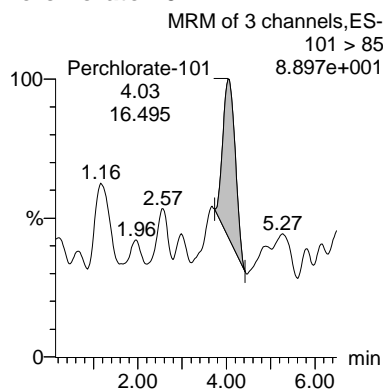
Perchlorate



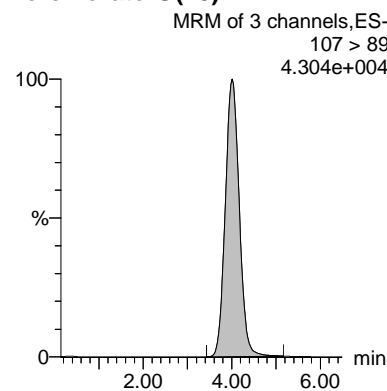
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB005	Perchlorate	99 > 83	4.09	32.461	0.001	bb			0.0010			6.871	1.97
IPB005	Perchlorate-101	101 > 85	4.03	16.495	0.001	bb			0.0015			4.416	
IPB005	Perchlorate-O(18)	107 > 89	4.01	15615.953	15615.953	bb			0.5073	101.46	1.46	2420.0...	

Miscellaneous

Prep Logbook

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1651011 Verified by: _____
 Analyst: Grace Cappelmann
 Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
 Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203755635 MB	27-MAR-2017 14:00:00	10	10	1
1203755636 LCS	27-MAR-2017 14:00:00	10	10	1
1203755639 ICS	27-MAR-2017 14:00:00	10	10	1
418938001	27-MAR-2017 14:00:00	10	10	1
1203755637 MS (418938001)	27-MAR-2017 14:00:00	10	10	1
1203755638 MSD (418938001)	27-MAR-2017 14:00:00	10	10	1
418938002	27-MAR-2017 14:00:00	10	10	1
418938003	27-MAR-2017 14:00:00	10	10	1
418938004	27-MAR-2017 14:00:00	10	10	1
418938005	27-MAR-2017 14:00:00	10	10	1
418939001	27-MAR-2017 14:00:00	10	10	1
419110001	27-MAR-2017 14:00:00	10	10	1
419111001	27-MAR-2017 14:00:00	10	10	1
419111002	27-MAR-2017 14:00:00	10	10	1
419111003	27-MAR-2017 14:00:00	10	10	1
419111004	27-MAR-2017 14:00:00	10	10	1
419111005	27-MAR-2017 14:00:00	10	10	1
419111006	27-MAR-2017 14:00:00	10	10	1
419111007	27-MAR-2017 14:00:00	10	10	1
419111008	27-MAR-2017 14:00:00	10	10	1
419111009	27-MAR-2017 14:00:00	10	10	1
419111010	27-MAR-2017 14:00:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203755639	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161107-2.5-Ba/Ag/H
LCS	1203755636	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203755637	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203755638	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/28/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per032817a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/28/17

Standard-Samp Reagent Lot#.: 2457559

Alt Check Std. ID: WCL170320-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0328001a	IPB001	GXC1	3/28/2017 17:22			1		USE	B
per0328002a	IPB001	GXC1	3/28/2017 17:32			1		USE	B
per0328003a	WCLICAL-01	GXC1	3/28/2017 17:41			1		USE	I
per0328004a	WCLICAL-02	GXC1	3/28/2017 17:51			1		USE	I
per0328005a	WCLICAL-03	GXC1	3/28/2017 18:00			1		USE	I
per0328006a	WCLICAL-04	GXC1	3/28/2017 18:10			1		USE	I
per0328007a	WCLICAL-05	GXC1	3/28/2017 18:19			1		USE	I
per0328008a	WCLICAL-06	GXC1	3/28/2017 18:28			1		USE	I
per0328009a	IPB002	GXC1	3/28/2017 18:38			1		USE	B
per0328010a	WCLICV	GXC1	3/28/2017 18:47			1		USE	C
per0328011a	IPB003	GXC1	3/28/2017 18:57			1		USE	B
per0328012a	WCLCRI	GXC1	3/28/2017 19:06			1		USE	C
per0328013a	1203755635	GXC1	3/28/2017 19:16	1651013	Various	1	MBAC	USE	S
per0328014a	1203755636	GXC1	3/28/2017 19:25	1651013	Various	1	MBAC	USE	S
per0328015a	1203755639	GXC1	3/28/2017 19:35	1651013	Various	1	MBAC	USE	S
per0328016a	418938001	GXC1	3/28/2017 19:44	1651013	418938	5	MBAC	USE	S
per0328017a	1203755637	GXC1	3/28/2017 19:54	1651013	418938	5	MBAC	USE	S
per0328018a	1203755638	GXC1	3/28/2017 20:03	1651013	418938	5	MBAC	USE	S
per0328019a	418938002	GXC1	3/28/2017 20:12	1651013	418938	1	MBAC	USE	S
per0328020a	418938003	GXC1	3/28/2017 20:22	1651013	418938	1	MBAC	USE	S
per0328021a	418938004	GXC1	3/28/2017 20:31	1651013	418938	1	MBAC	USE	S
per0328022a	418938005	GXC1	3/28/2017 20:41	1651013	418938	1	MBAC	USE	S
per0328023a	WCLCCV	GXC1	3/28/2017 20:50			1		USE	C
per0328024a	IPB004	GXC1	3/28/2017 21:00			1		USE	B
per0328025a	WCLCRI	GXC1	3/28/2017 21:09			1		USE	C
per0328026a	418939001	GXC1	3/28/2017 21:19	1651013	418939	1	MBAC	USE	S
per0328027a	419110001	GXC1	3/28/2017 21:28	1651013	419110	5	MBAC	USE	S
per0328028a	419111001	GXC1	3/28/2017 21:38	1651013	419111	1	MBAC	USE	S
per0328029a	419111002	GXC1	3/28/2017 21:47	1651013	419111	1	MBAC	USE	S

per0328030a	419111003	GXC1	3/28/2017 21:57	1651013	419111	2000	MBAC	USE	S
per0328031a	419111004	GXC1	3/28/2017 22:06	1651013	419111	1	MBAC	USE	S
per0328032a	419111005	GXC1	3/28/2017 22:16	1651013	419111	1	MBAC	USE	S
per0328033a	419111006	GXC1	3/28/2017 22:25	1651013	419111	1	MBAC	USE	S
per0328034a	419111007	GXC1	3/28/2017 22:35	1651013	419111	1	MBAC	USE	S
per0328035a	419111008	GXC1	3/28/2017 22:44	1651013	419111	1	MBAC	USE	S
per0328036a	WCLCCV	GXC1	3/28/2017 22:53			1		USE	C
per0328037a	IPB005	GXC1	3/28/2017 23:03			1		USE	B
per0328038a	WCLCRI	GXC1	3/28/2017 23:12			1		USE	C
per0328039a	419111009	GXC1	3/28/2017 23:22	1651013	419111	1	MBAC	USE	S
per0328040a	419111010	GXC1	3/28/2017 23:31	1651013	419111	1	MBAC	USE	S
per0328041a	IPB006	GXC1	3/28/2017 23:41			1		USE	B
per0328042a	1203756791	GXC1	3/28/2017 23:50	1651435	2017-1250	1	ARSL	USE	S
per0328043a	1203756792	GXC1	3/29/2017 0:00	1651435	2017-1250	1	ARSL	USE	S
per0328044a	1203756795	GXC1	3/29/2017 0:09	1651435	2017-1250	1	ARSL	USE	S
per0328045a	419173001	GXC1	3/29/2017 0:19	1651435	2017-1250	1	ARSL	USE	S
per0328046a	1203756793	GXC1	3/29/2017 0:28	1651435	2017-1250	1	ARSL	USE	S
per0328047a	1203756794	GXC1	3/29/2017 0:38	1651435	2017-1250	1	ARSL	USE	S
per0328048a	WCLCCV	GXC1	3/29/2017 0:47			1		USE	C
per0328049a	IPB007	GXC1	3/29/2017 0:57			1		USE	B
per0328050a	WCLCRI	GXC1	3/29/2017 1:06			1		USE	C

DATA EXCEPTION REPORT

Mo.Day Yr. 29-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1651013	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 418938,418939,419110,419111			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. In 1203755637 (MS) and 1203755638 (MSD) a 0% recovery of Perchlorate was observed. The acceptance range is 75-125%. The detected concentrations in the MS and MSD were lower than the detected concentration in the parent sample.		1. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418938001 (18WW08-032017) and the need of a 1:5 dilution prior to analysis. Will report data and note in case narrative.	

Originator's Name:

Grace Cappelmann 29-MAR-17

Data Validator/Group Leader:

Charles Wilson 30-MAR-17

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



April 05, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

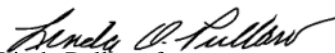
Re: Perchlorate-Steed
Work Order: 419110

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 23, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,


Linda Pullano for
Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

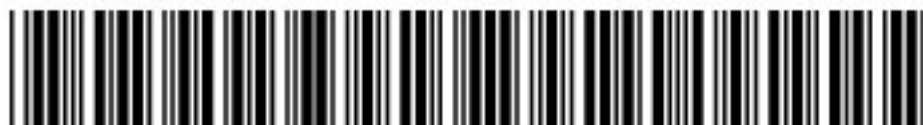


Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	45
Miscellaneous.....	64

Case Narrative

Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 419110

April 05, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 23, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

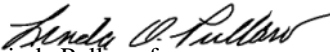
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
419110001	LH18/24-SP650-6426-Grab

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.


Linda Pullano for
Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

419110

CHAIN OF CUSTODY

Name Of Lab Shipping To: GEL Laboratories (843) 556-8171 ATTN: HOPE TAYLOR

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No. 60256135.GWTPT HRUMAR16	
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES			
Prepared By: Scott Beesinger		P.O. Number	
Field Sample I.D. LH18/24-SP650-6426-Grab		Sample Matrix Water	Date / Time 03/22/17 / 15:00
MS / MSD 1		No. OF CONTAINERS 1	
Analyses PERCHLORATE		Remarks (Preservatives, etc.)	
Lab I.D.#			

Additional Remarks: STANDARD TAT

Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	03/22/17	15:30	<i>Hope Taylor</i>	3/22/17	9:28						

Received At Lab By:				For Lab Use Only			
Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.
Remarks:							



SAMPLE RECEIPT & REVIEW FORM

Client: MBAC		SDG/AR/COC/Work Order: 419110	
Received By: STACY BOGNE		Date Received: 3/23/17	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other	
		J461 688 229 2	
Suspected Hazard Information		Yes	No
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
Hazard Class Shipped:		UN#:	
Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr		Classified as: Rad 1 Rad 2 Rad 3	
If yes, select Hazards below, and contact the GEL Safety Group.		PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	
Sample Receipt Criteria		Yes	NA
		Yes	No
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Do any samples require Volatile Analysis?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed): 			

PM (or PMA) review: Initials HH Date 032317 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 30 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
Microbac Laboratories, Inc Kentucky Division (MBAC)
SDG #: 419110**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1651013

Prep Batch Number: 1651011

Sample Analysis

Sample ID	Client ID
419110001	419110001 (LH18/24-SP650-6426-Grab)
1203755639	Interference Check Sample (ICS)
1203755635	Method Blank (MB)
1203755636	Laboratory Control Sample (LCS)
1203755637	418938001(18WW08-032017) Matrix Spike (MS)
1203755638	418938001(18WW08-032017) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418938001 (18WW08-032017) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203755637 (MS) and 1203755638 (MSD) a 0% recovery of Perchlorate was observed. The acceptance range is 75-125%. The detected concentrations in the MS and MSD were lower than the detected concentration in the parent sample. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418938001 (18WW08-032017) and the need of a 1:5 dilution prior to analysis. 1203755637 (18WW08-032017MS) and 1203755638 (18WW08-032017MSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those

holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203755637 (18WW08-032017MS), 1203755638 (18WW08-032017MSD) and 419110001 (LH18/24-SP650-6426-Grab) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

The entire batch was re-analyzed the following day due to the problems with the method blank. A detection of Perchlorate was observed just below our concentration of our low level standard. Upon the analysis of a new aliquot of method blank, the high detection was not confirmed. All samples were re-aliquot and re-analyzed. All QC requirements were met and all data could be reported.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1618609 was generated for samples 1203755637 (18WW08-032017MS) and 1203755638 (18WW08-032017MSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 419110 GEL Work Order: 419110

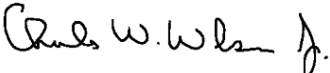
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 30 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1651011Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6426-GrabDate Received: 23-MAR-17GEL Job No (SDG): 419110GEL Sample ID: 419110001Date Filtered: 27-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	6.06	ug/L		5	28-MAR-17 21:28	per0328027a
	Perchlorate-O(18)			2.52	ug/L		5	28-MAR-17 21:28	per0328027a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 419110

Extract Batch Code: 1651011

Date Filtered: 27-MAR-17

Matrix: WATER

Sample ID: 1203755636

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.196	ug/L	98		85 - 115
Perchlorate-O(18)		.5	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 419110Extract Batch Code: 1651011Date Filtered: 27-MAR-17Matrix: WATERSample ID: 1203755639

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	106		70 - 130
Perchlorate-O(18)		.506	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 419110Extract Batch Code: 1651011Date Extracted: 27-MAR-17GEL MS/PS ID: 1203755637Client ID: 18WW08-032017GEL MSD/PSD ID: 1203755638QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	7.72	ug/L	7.46	0 *	7.45	0 *	0	30	75 - 125
Perchlorate-O(18)	0	2.41	ug/L	2.49		2.45		2		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0328006a	28-MAR-17	15530.6				
Lower Area Limit			7765.3				
Upper Area Limit			23295.9				
1203755635	per0328013a	28-MAR-17 19:16	15097.5	4.09	4.06102	.993	
1203755636	per0328014a	28-MAR-17 19:25	15400.2	4.06	4.08867	1.007	
1203755639	per0328015a	28-MAR-17 19:35	15579.7	4.06	4.08867	1.007	
1203755637	per0328017a	28-MAR-17 19:54	15340.7	4.03	4.08867	1.015	
1203755638	per0328018a	28-MAR-17 20:03	15112	4.06	4.08867	1.007	
419110001	per0328027a	28-MAR-17 21:28	15537.7	4.03	4.06102	1.008	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6426-Grab

Date Received: 23-MAR-17

GEL Job No (SDG): 419110

GEL Sample ID: 419110001

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	6.06	ug/L		5	28-MAR-17 21:28	per0328027a
	Perchlorate-O(18)			2.52	ug/L		5	28-MAR-17 21:28	per0328027a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

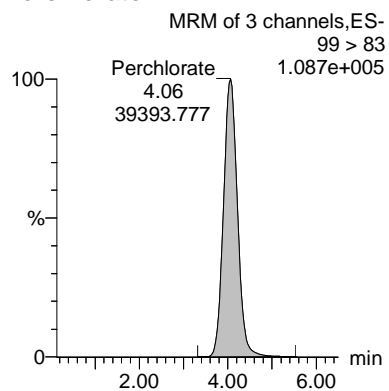
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

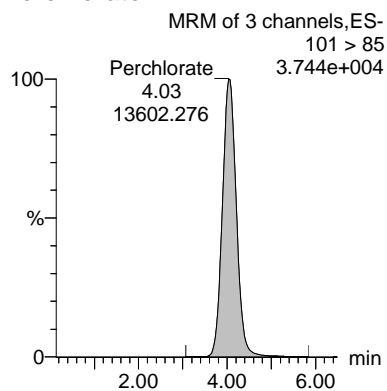
CWW
 03/30/2017

Name: per0328027a
Date: 28-Mar-2017
Time: 21:28:44
ID: 419110001
Vial: 1:4,F

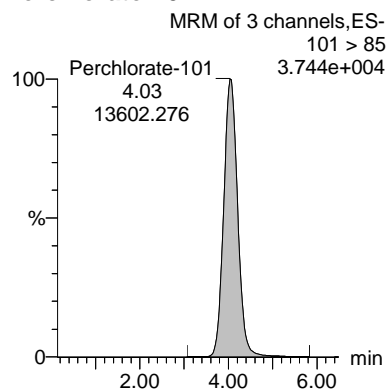
Perchlorate



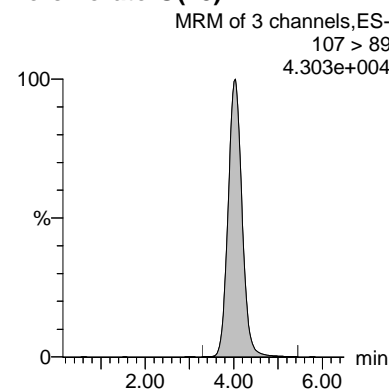
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
419110001	Perchlorate	99 > 83	4.06	39393.777	1.268	bb			1.2113			5661.4... 2.90
419110001	Perchlorate-101	101 > 85	4.03	13602.276	0.438	bb			1.2396			957.022
419110001	Perchlorate-O(18)	107 > 89	4.03	15537.673	15537.673	bb			0.5047	100.95	0.95	3421.6...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419110

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 28-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate

Coefficient of Determination: .

Calibration Curve: 1.04667

Response Type: Internal Standard

Curve Type: RF

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419110

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 28-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .35333

Response Type: Internal Standard

Curve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld

GL
03/29/2017CW
03/30/2017

Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time

Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per032817a.mdb 28 Mar 2017 15:32:39**Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per032817a.cdb 29 Mar 2017 09:31:28**

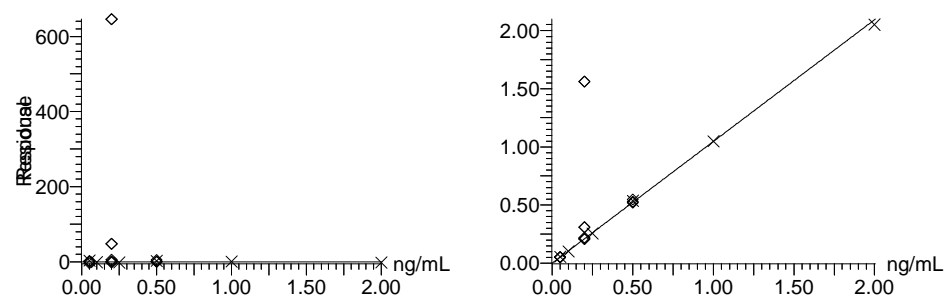
Compound name: Perchlorate

Response Factor: 1.04651

RRF SD: 0.023016, % Relative SD: 2.19931

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



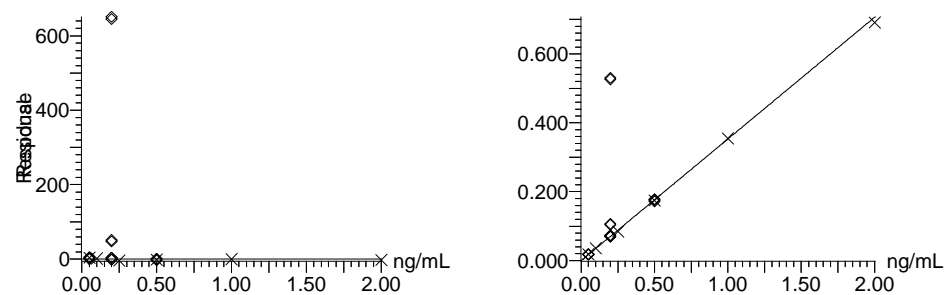
Compound name: Perchlorate-101

Response Factor: 0.353102

RRF SD: 0.0106439, % Relative SD: 3.0144

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld

Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time

Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

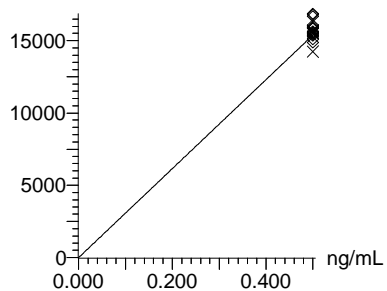
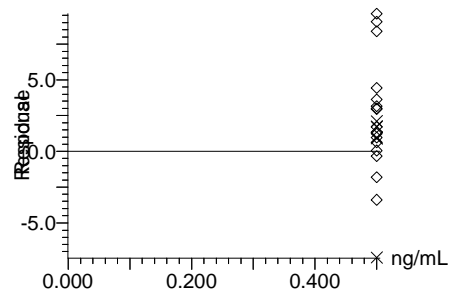
Compound name: Perchlorate-O(18)

Response Factor: 30783

RRF SD: 1128.79, % Relative SD: 3.66692

Response type: External Std, Area

Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

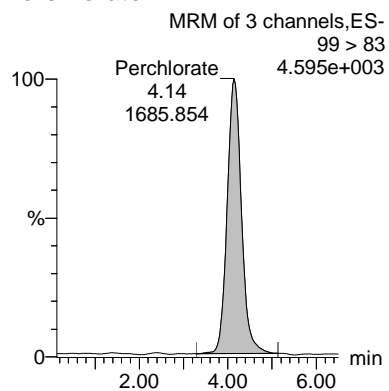
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

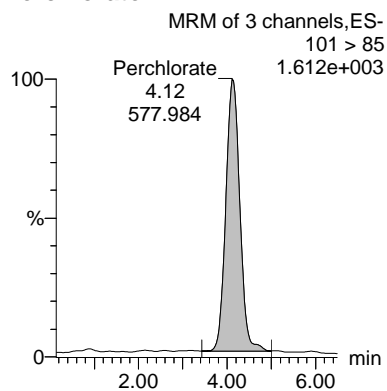
CWW
 03/30/2017

Name: per0328003a
Date: 28-Mar-2017
Time: 17:41:40
ID: WCL170320-01
Vial: 1:1,B

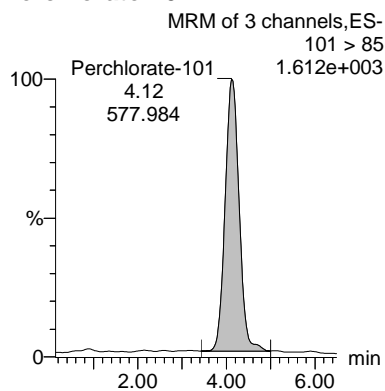
Perchlorate



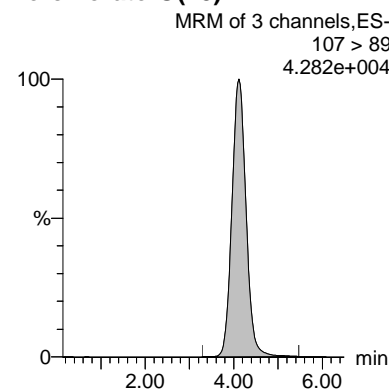
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-01	Perchlorate	99 > 83	4.14	1685.854	0.054	bb			0.0514	102.87	2.87	264.540	2.92
WCL170320-01	Perchlorate-101	101 > 85	4.12	577.984	0.018	bb			0.0523	104.52	4.52	181.765	
WCL170320-01	Perchlorate-O(18)	107 > 89	4.12	15660.600	15660.600	bb			0.5087	101.75	1.75	4034.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

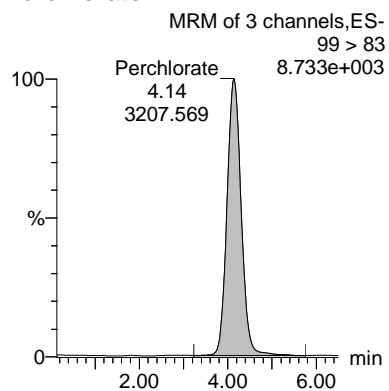
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

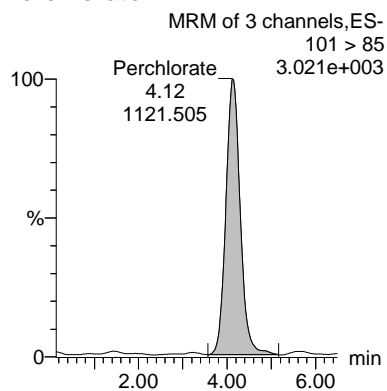
CWW
 03/30/2017

Name: per0328004a
Date: 28-Mar-2017
Time: 17:51:08
ID: WCL170320-02
Vial: 1:1,C

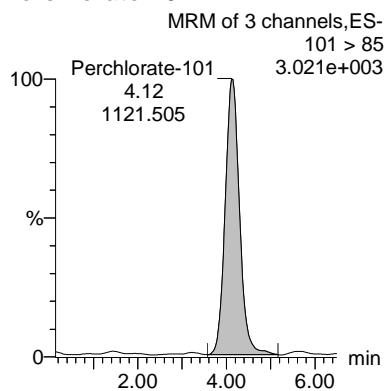
Perchlorate



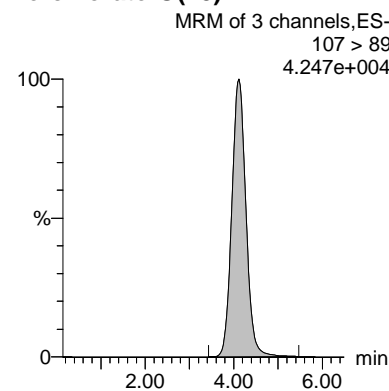
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-02	Perchlorate	99 > 83	4.14	3207.569	0.103	bb			0.0986	98.61	-1.39	1722.6...	2.86
WCL170320-02	Perchlorate-101	101 > 85	4.12	1121.505	0.036	bb			0.1022	102.18	2.18	237.467	
WCL170320-02	Perchlorate-O(18)	107 > 89	4.12	15541.402	15541.402	bb			0.5049	100.97	0.97	3529.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

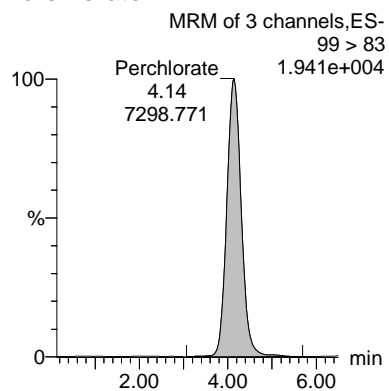
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

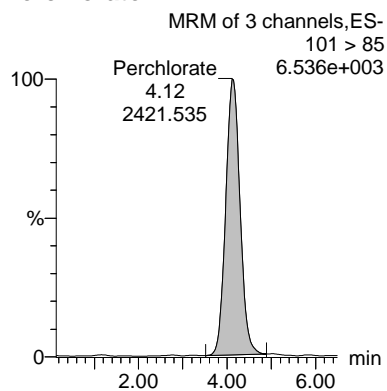
CWW
 03/30/2017

Name: per0328005a
Date: 28-Mar-2017
Time: 18:00:35
ID: WCL170320-03
Vial: 1:1,D

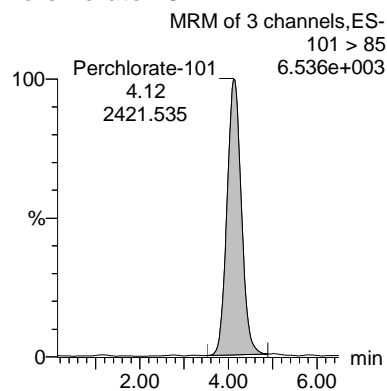
Perchlorate



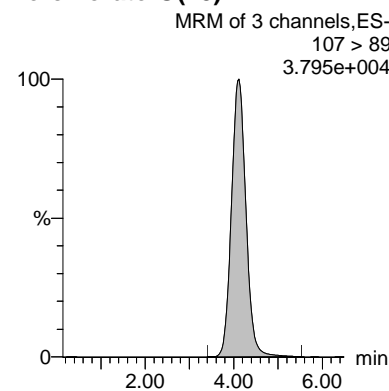
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-03	Perchlorate	99 > 83	4.14	7298.771	0.256	bb			0.2447	97.89	-2.11	625.719	3.01
WCL170320-03	Perchlorate-101	101 > 85	4.12	2421.535	0.085	bb			0.2406	96.26	-3.74	435.045	
WCL170320-03	Perchlorate-O(18)	107 > 89	4.12	14248.785	14248.785	bb			0.4629	92.58	-7.42	2410.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

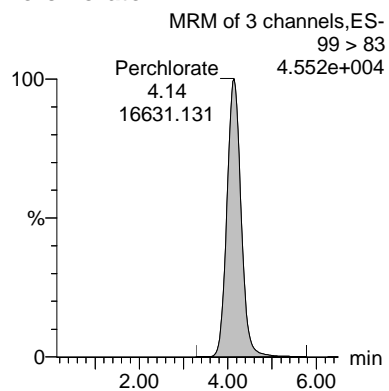
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

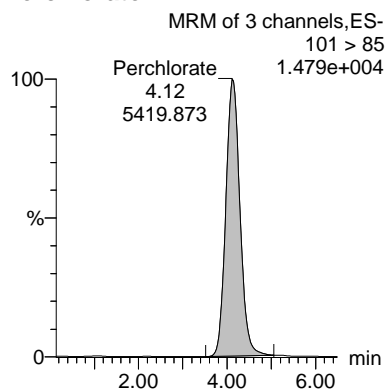
CWW
 03/30/2017

Name: per0328006a
Date: 28-Mar-2017
Time: 18:10:02
ID: WCL170320-04
Vial: 1:1,E

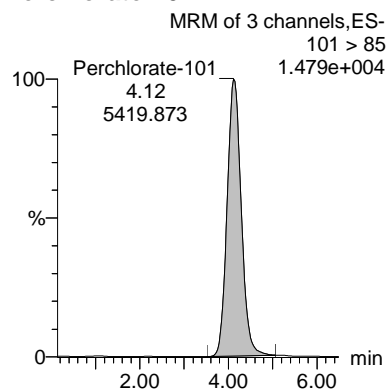
Perchlorate



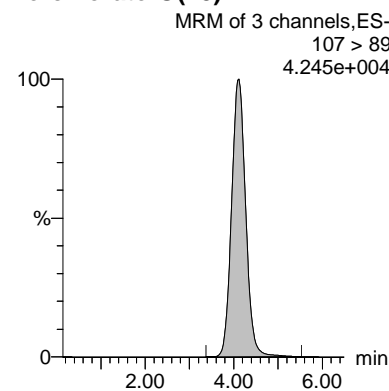
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-04	Perchlorate	99 > 83	4.14	16631.131	0.535	bb			0.5116	102.33	2.33	2542.8...	3.07
WCL170320-04	Perchlorate-101	101 > 85	4.12	5419.873	0.174	bb			0.4942	98.83	-1.17	1419.4...	
WCL170320-04	Perchlorate-O(18)	107 > 89	4.12	15530.634	15530.634	bb			0.5045	100.90	0.90	6433.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

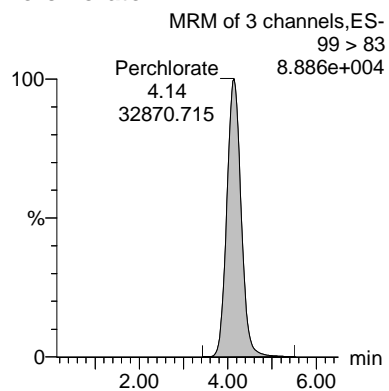
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

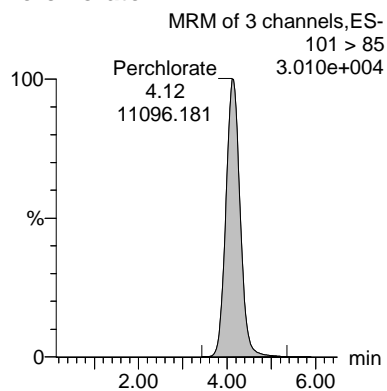
CWW
 03/30/2017

Name: per0328007a
Date: 28-Mar-2017
Time: 18:19:29
ID: WCL170320-05
Vial: 1:1,F

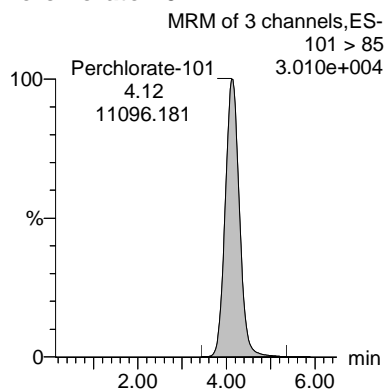
Perchlorate



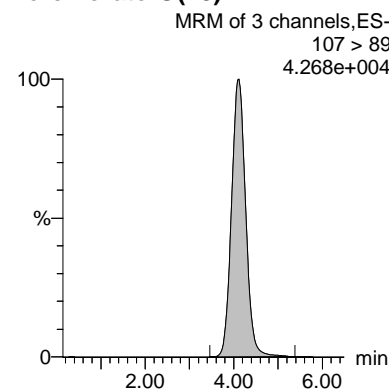
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-05	Perchlorate	99 > 83	4.14	32870.715	1.050	bb			1.0033	100.33	0.33	5946.6...	2.96
WCL170320-05	Perchlorate-101	101 > 85	4.12	11096.181	0.354	bb			1.0038	100.38	0.38	4116.1...	
WCL170320-05	Perchlorate-O(18)	107 > 89	4.12	15653.696	15653.696	bb			0.5085	101.70	1.70	1806.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

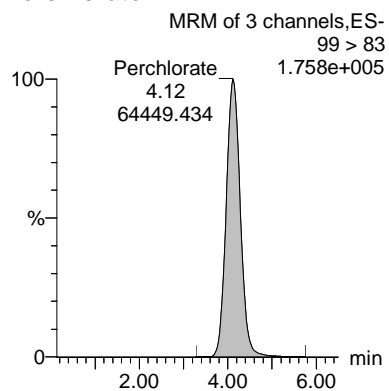
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

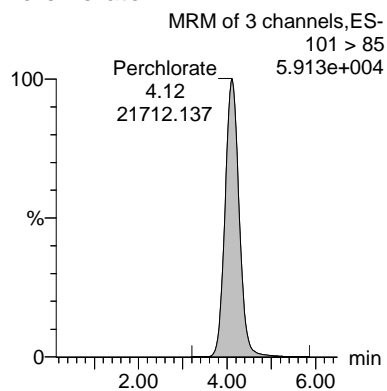
CW
 03/30/2017

Name: per0328008a
Date: 28-Mar-2017
Time: 18:28:55
ID: WCL170320-06
Vial: 1:2,A

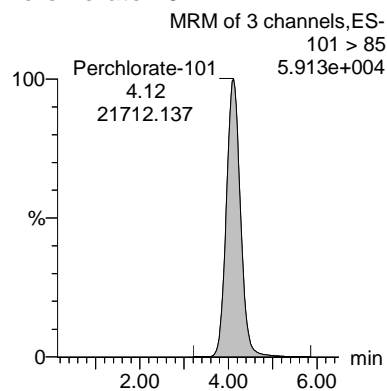
Perchlorate



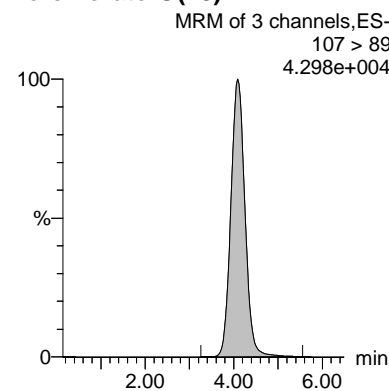
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-06	Perchlorate	99 > 83	4.12	64449.434	2.051	bb			1.9596	97.98	-2.02	11932....	2.97
WCL170320-06	Perchlorate-101	101 > 85	4.12	21712.137	0.691	bb			1.9565	97.83	-2.17	2202.0...	
WCL170320-06	Perchlorate-O(18)	107 > 89	4.09	15713.861	15713.861	bb			0.5105	102.09	2.09	5310.3...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.5	99.53	28-MAR-17 18:47	per0328010a
Perchlorate Isotope Ratio		2.92		28-MAR-17 18:47	per0328010a
Perchlorate-101	.5	.51	101.04	28-MAR-17 18:47	per0328010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

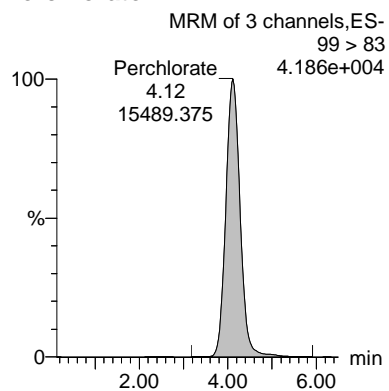
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

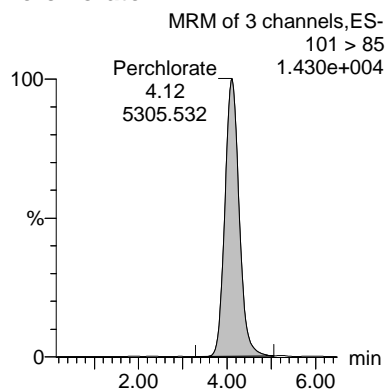
CWW
 03/30/2017

Name: per0328010a
Date: 28-Mar-2017
Time: 18:47:51
ID: WCL170320-07ICV
Vial: 1:2,B

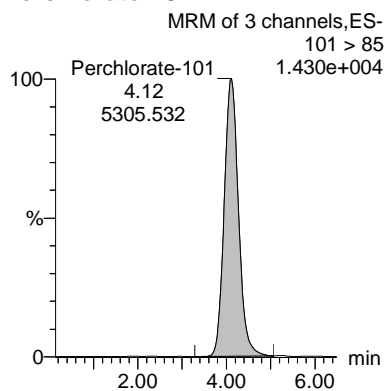
Perchlorate



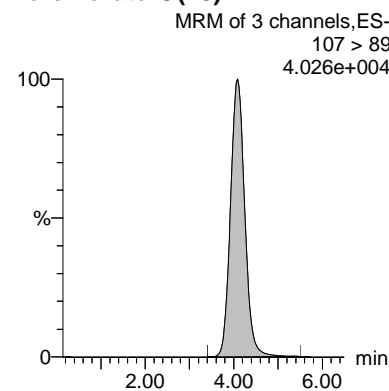
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07ICV	Perchlorate	99 > 83	4.12	15489.375	0.521	bb			0.4977	99.53	-0.47	3353.3...	2.92
WCL170320-07ICV	Perchlorate-101	101 > 85	4.12	5305.532	0.178	bb			0.5052	101.04	1.04	1142.2...	
WCL170320-07ICV	Perchlorate-O(18)	107 > 89	4.09	14870.273	14870.273	bb			0.4831	96.61	-3.39	590.627	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.52	104.31	28-MAR-17 20:50	per0328023a
Perchlorate Isotope Ratio		3.13		28-MAR-17 20:50	per0328023a
Perchlorate-101	.5	.49	98.81	28-MAR-17 20:50	per0328023a
Perchlorate	.5	.5	100.49	28-MAR-17 22:53	per0328036a
Perchlorate Isotope Ratio		3.06		28-MAR-17 22:53	per0328036a
Perchlorate-101	.5	.49	97.34	28-MAR-17 22:53	per0328036a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

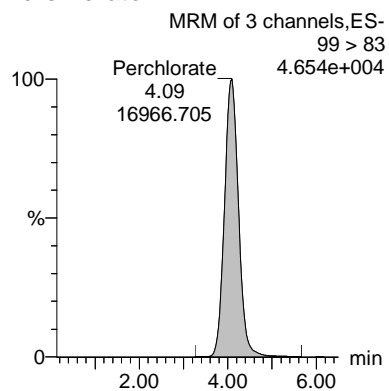
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

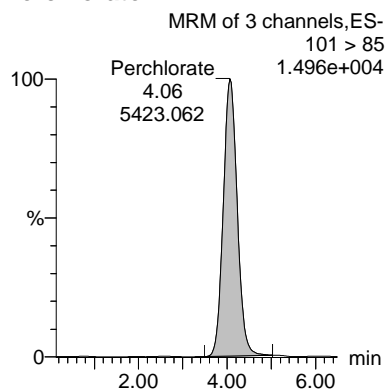
CWW
 03/30/2017

Name: per0328023a
Date: 28-Mar-2017
Time: 20:50:53
ID: WCL170320-07CCV
Vial: 1:2,B

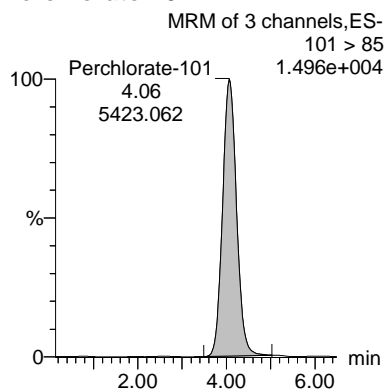
Perchlorate



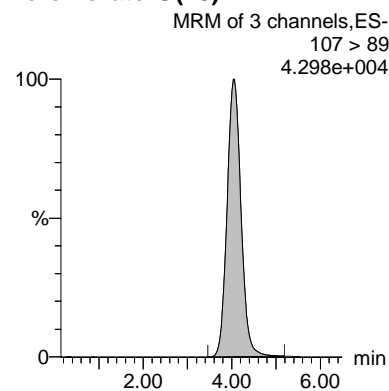
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	4.09	16966.705	0.546	bb			0.5215	104.31	4.31	3293.1...	3.13
WCL170320-07CCV	Perchlorate-101	101 > 85	4.06	5423.062	0.174	bb			0.4941	98.81	-1.19	664.482	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	4.03	15543.203	15543.203	bb			0.5049	100.99	0.99	4090.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

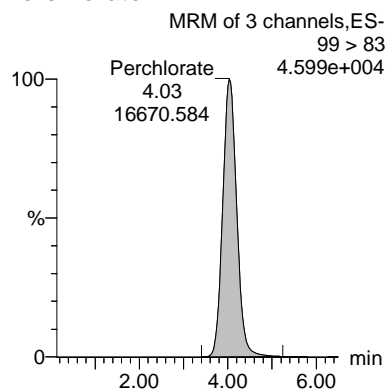
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

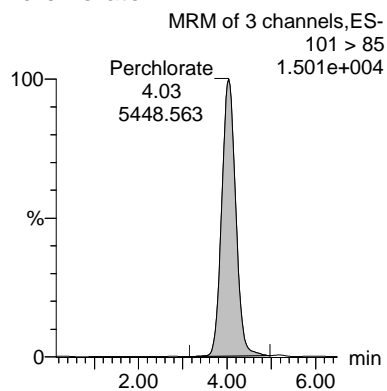
CWW
 03/30/2017

Name: per0328036a
Date: 28-Mar-2017
Time: 22:53:59
ID: WCL170320-07CCV
Vial: 1:2,B

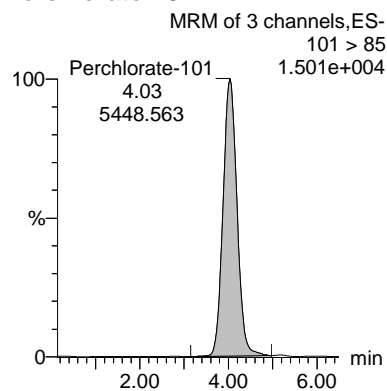
Perchlorate



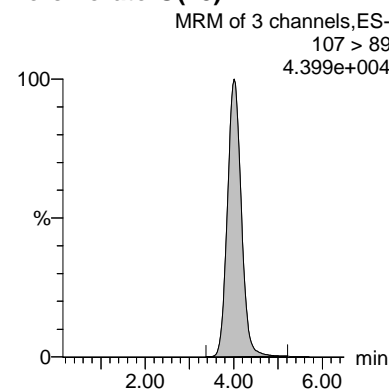
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	4.03	16670.584	0.526	bb			0.5025	100.49	0.49	3325.0...	3.06
WCL170320-07CCV	Perchlorate-101	101 > 85	4.03	5448.563	0.172	bb			0.4867	97.34	-2.66	781.536	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	4.01	15851.859	15851.859	bb			0.5150	102.99	2.99	2720.8...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	100.74	28-MAR-17 19:06	per0328012a
Perchlorate Isotope Ratio		2.81		28-MAR-17 19:06	per0328012a
Perchlorate-101	.05	.05	106.07	28-MAR-17 19:06	per0328012a
Perchlorate	.05	.05	101.79	28-MAR-17 21:09	per0328025a
Perchlorate Isotope Ratio		2.94		28-MAR-17 21:09	per0328025a
Perchlorate-101	.05	.05	102.48	28-MAR-17 21:09	per0328025a
Perchlorate	.05	.05	96.48	28-MAR-17 23:12	per0328038a
Perchlorate Isotope Ratio		2.84		28-MAR-17 23:12	per0328038a
Perchlorate-101	.05	.05	100.64	28-MAR-17 23:12	per0328038a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

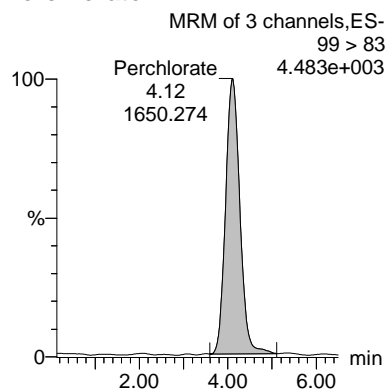
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

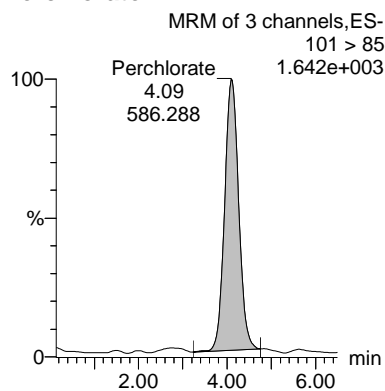
CWW
 03/30/2017

Name: per0328012a
Date: 28-Mar-2017
Time: 19:06:45
ID: WCL170320-08CRI
Vial: 1:2,C

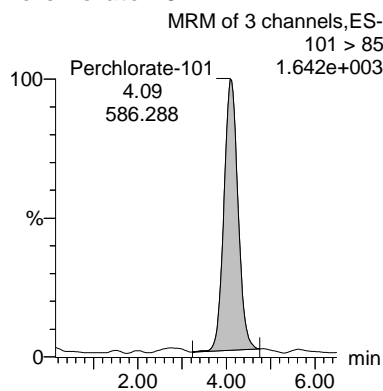
Perchlorate



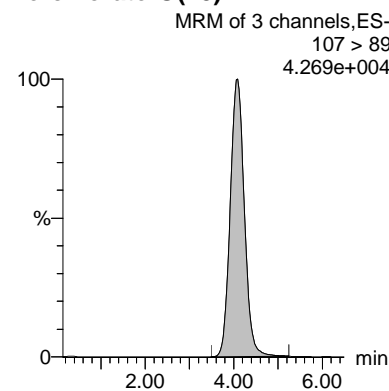
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.12	1650.274	0.053	bb			0.0504	100.74	0.74	501.890	2.81
WCL170320-08CRI	Perchlorate-101	101 > 85	4.09	586.288	0.019	bb			0.0530	106.07	6.07	100.665	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.09	15653.307	15653.307	bb			0.5085	101.70	1.70	3864.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

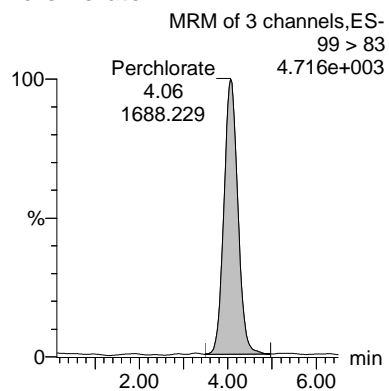
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
 Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
 Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

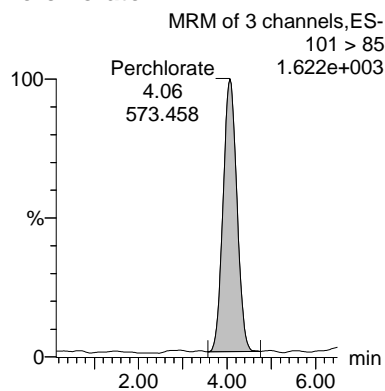
CWW
 03/30/2017

Name: per0328025a
Date: 28-Mar-2017
Time: 21:09:49
ID: WCL170320-08CRI
Vial: 1:2,C

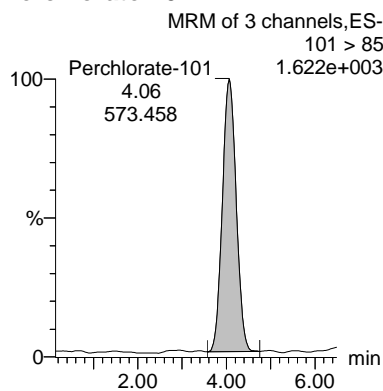
Perchlorate



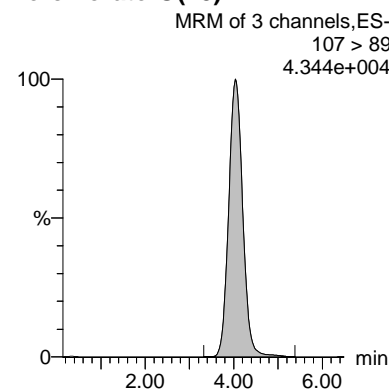
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.06	1688.229	0.053	bb			0.0509	101.79	1.79	528.091	2.94
WCL170320-08CRI	Perchlorate-101	101 > 85	4.06	573.458	0.018	bb			0.0512	102.48	2.48	184.648	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.03	15847.729	15847.729	bb			0.5148	102.96	2.96	1672.2...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

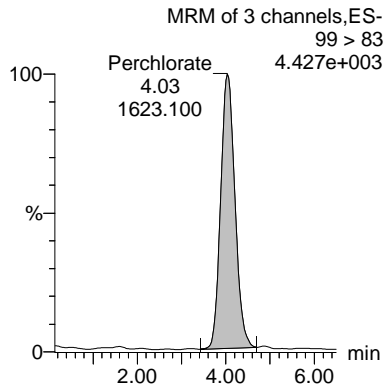
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
 Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
 Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

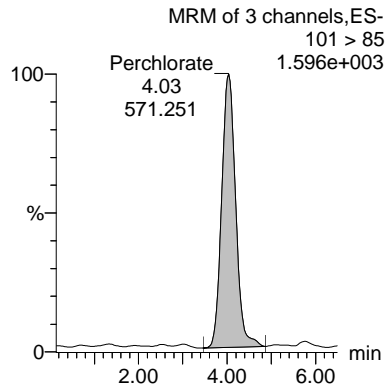
CWW
 03/30/2017

Name: per0328038a
Date: 28-Mar-2017
Time: 23:12:54
ID: WCL170320-08CRI
Vial: 1:2,C

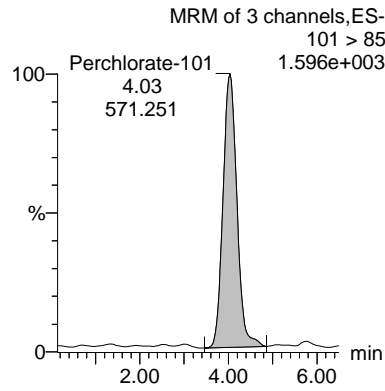
Perchlorate



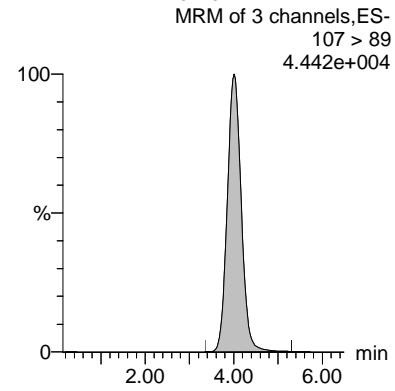
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	4.03	1623.100	0.050	bb			0.0482	96.48	-3.52	261.661	2.84
WCL170320-08CRI	Perchlorate-101	101 > 85	4.03	571.251	0.018	bb			0.0503	100.64	0.64	148.788	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	4.01	16075.658	16075.658	bb			0.5222	104.45	4.45	2606.2...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

MB

Date Received: 27-MAR-17

GEL Job No (SDG): 419110

GEL Sample ID: 1203755635

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	28-MAR-17 19:16	per0328013a
	Perchlorate-O(18)			0.490	ug/L		1	28-MAR-17 19:16	per0328013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

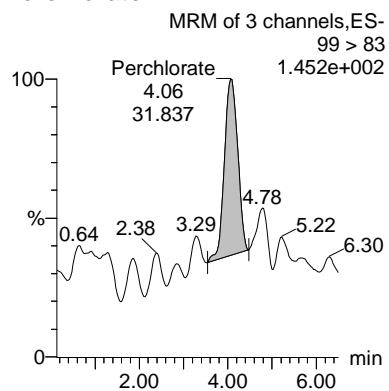
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

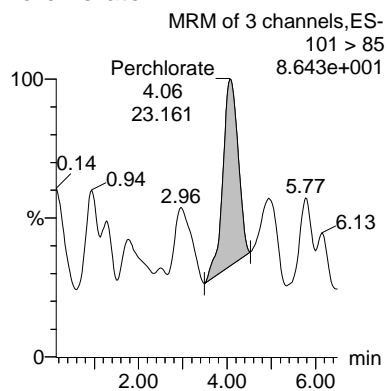
CWW
 03/30/2017

Name: per0328013a
Date: 28-Mar-2017
Time: 19:16:12
ID: 1203755635
Vial: 1:3,A

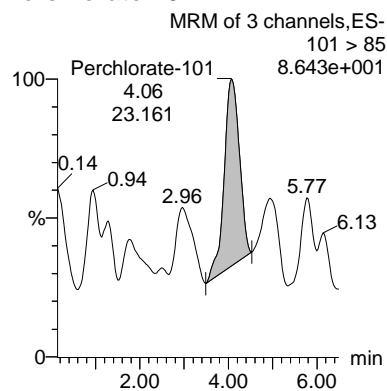
Perchlorate



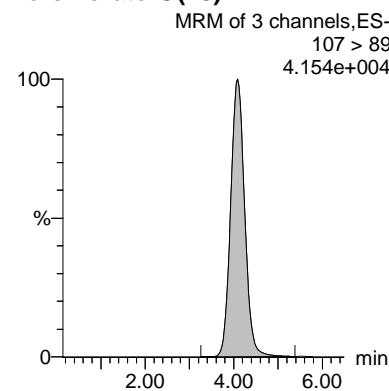
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203755635	Perchlorate	99 > 83	4.06	31.837	0.001	bb			0.0010			6.229 1.37
1203755635	Perchlorate-101	101 > 85	4.06	23.161	0.001	bb			0.0022			1.948
1203755635	Perchlorate-O(18)	107 > 89	4.09	15097.521	15097.521	bb			0.4905	98.09	-1.91	1465.2...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 27-MAR-17

GEL Job No (SDG): 419110

GEL Sample ID: 1203755636

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.196	ug/L	J	1	28-MAR-17 19:25	per0328014a
	Perchlorate-O(18)			0.500	ug/L		1	28-MAR-17 19:25	per0328014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

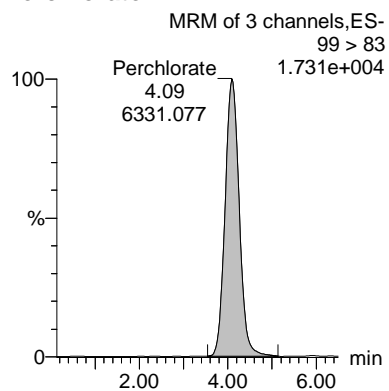
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

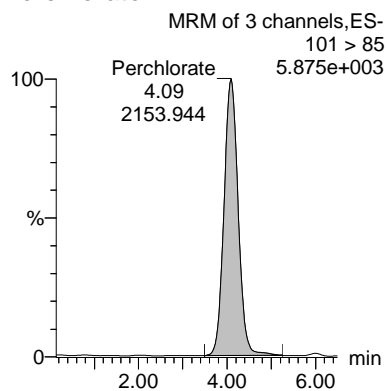
CW
 03/30/2017

Name: per0328014a
Date: 28-Mar-2017
Time: 19:25:41
ID: 1203755636
Vial: 1:3,B

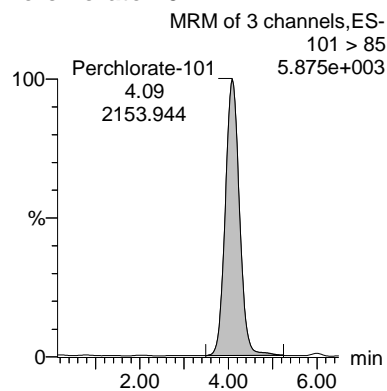
Perchlorate



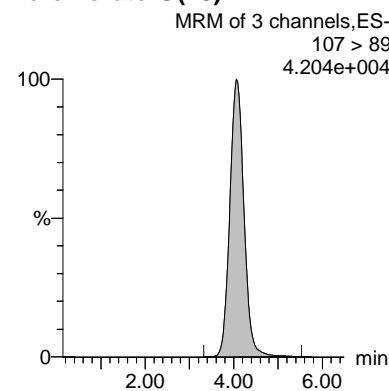
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755636	Perchlorate	99 > 83	4.09	6331.077	0.206	bb			0.1964	98.21	-1.79	710.715	2.94
1203755636	Perchlorate-101	101 > 85	4.09	2153.944	0.070	bb			0.1981	99.03	-0.97	363.928	
1203755636	Perchlorate-O(18)	107 > 89	4.06	15400.181	15400.181	bb			0.5003	100.06	0.06	3437.1...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 419110

GEL Sample ID: 1203755639

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.211	ug/L		1	28-MAR-17 19:35	per0328015a
	Perchlorate-O(18)			0.506	ug/L		1	28-MAR-17 19:35	per0328015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

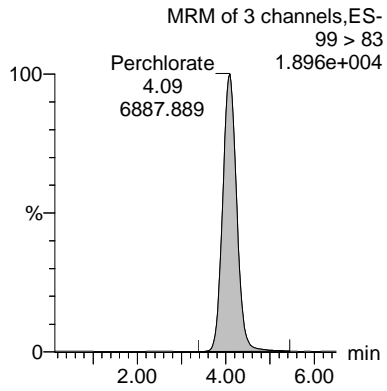
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

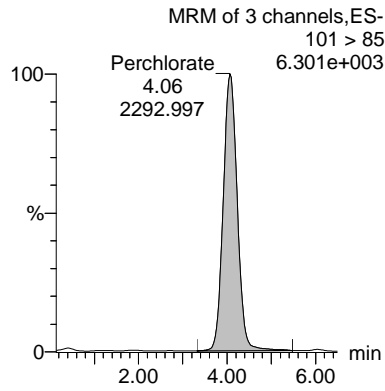
CWW
 03/30/2017

Name: per0328015a
Date: 28-Mar-2017
Time: 19:35:09
ID: 1203755639
Vial: 1:3,C

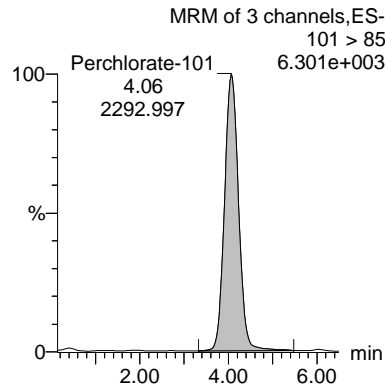
Perchlorate



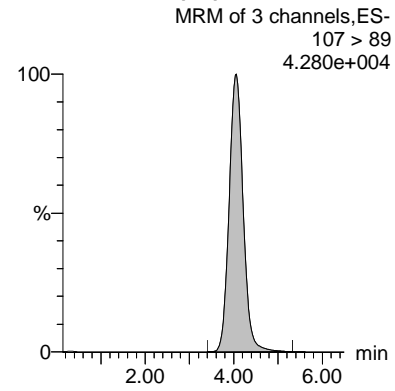
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203755639	Perchlorate	99 > 83	4.09	6887.889	0.221	bb			0.2112	105.61	5.61	3146.6... 3.00
1203755639	Perchlorate-101	101 > 85	4.06	2292.997	0.074	bb			0.2084	104.20	4.20	516.199
1203755639	Perchlorate-O(18)	107 > 89	4.06	15579.710	15579.710	bb			0.5061	101.22	1.22	3501.5...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

18WW08-032017MS

Date Received: 21-MAR-17

GEL Job No (SDG): 419110

GEL Sample ID: 1203755637

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	7.46	ug/L		5	28-MAR-17 19:54	per0328017a
	Perchlorate-O(18)			2.49	ug/L		5	28-MAR-17 19:54	per0328017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

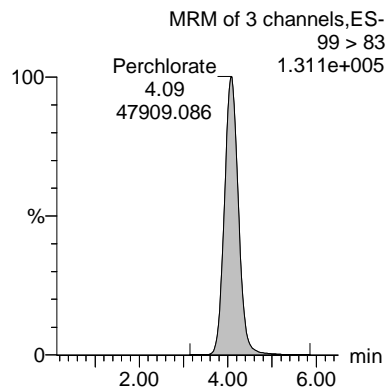
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

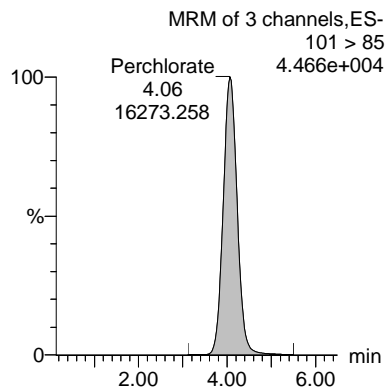
CWW
 03/30/2017

Name: per0328017a
Date: 28-Mar-2017
Time: 19:54:05
ID: 1203755637
Vial: 1:3,E

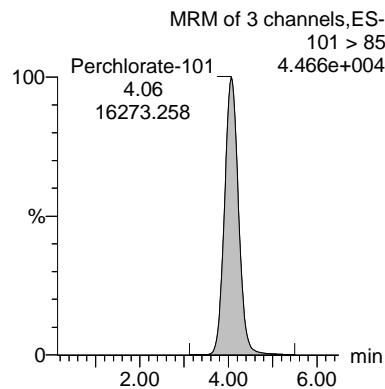
Perchlorate



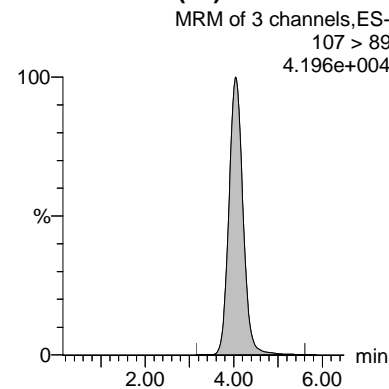
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755637	Perchlorate	99 > 83	4.09	47909.086	1.562	bb			1.4921	746.05	646.05	11634....	2.94
1203755637	Perchlorate-101	101 > 85	4.06	16273.258	0.530	bb			1.5021	751.05	651.05	1548.0...	
1203755637	Perchlorate-O(18)	107 > 89	4.03	15340.698	15340.698	bb			0.4983	99.67	-0.33	2750.6...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1651011

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

18WW08-032017MSD

Date Received: 21-MAR-17

GEL Job No (SDG): 419110

GEL Sample ID: 1203755638

Date Filtered: 27-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	7.45	ug/L		5	28-MAR-17 20:03	per0328018a
	Perchlorate-O(18)			2.45	ug/L		5	28-MAR-17 20:03	per0328018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

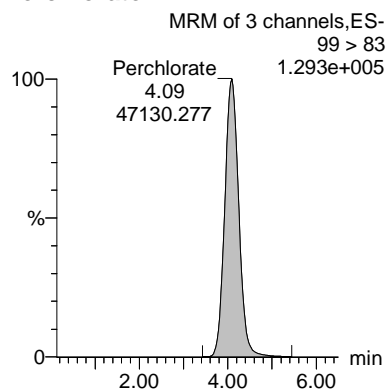
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

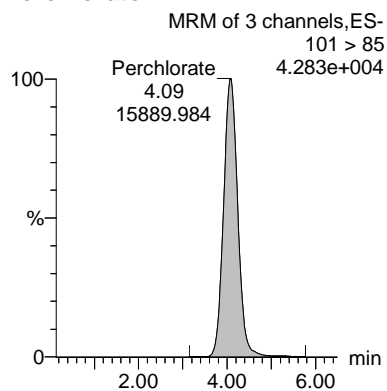
CWW
 03/30/2017

Name: per0328018a
Date: 28-Mar-2017
Time: 20:03:33
ID: 1203755638
Vial: 1:3,F

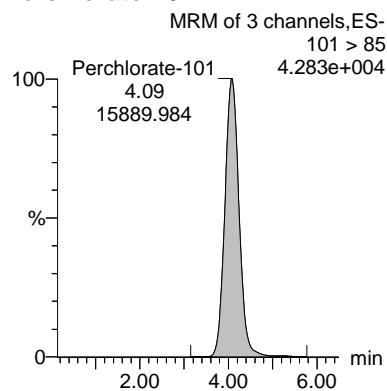
Perchlorate



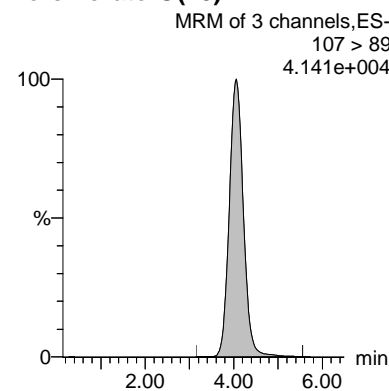
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203755638	Perchlorate	99 > 83	4.09	47130.277	1.559	bb			1.4901	745.03	645.03	4484.3...	2.97
1203755638	Perchlorate-101	101 > 85	4.09	15889.984	0.526	bb			1.4889	744.46	644.46	3362.7...	
1203755638	Perchlorate-O(18)	107 > 89	4.06	15111.959	15111.959	bb			0.4909	98.18	-1.82	5667.8...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	28-MAR-17	per0328001a	IPB001
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328001a	IPB001
Perchlorate	0.00	0	NA	28-MAR-17	per0328002a	IPB001
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

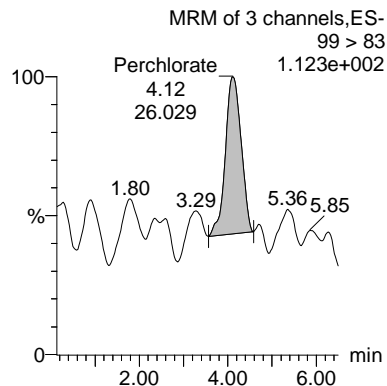
GL
 03/29/2017

CWW
 03/30/2017

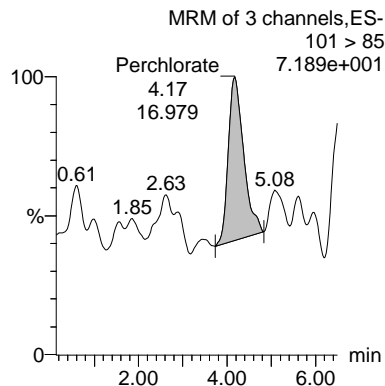
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per032817a.mdb 28 Mar 2017 15:32:39
Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per032817a.cdb 29 Mar 2017 09:31:28

Name: per0328001a
Date: 28-Mar-2017
Time: 17:22:40
ID: IPB001
Vial: 1:1,A

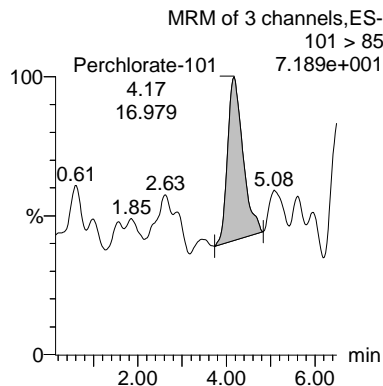
Perchlorate



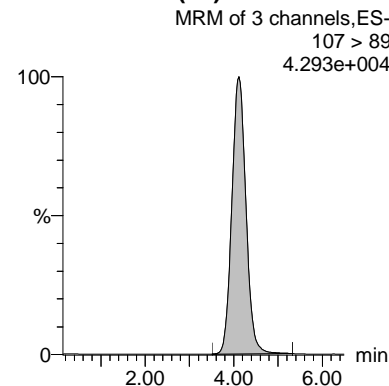
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	4.12	26.029	0.001	bb			0.0008			5.733 1.53
IPB001	Perchlorate-101	101 > 85	4.17	16.979	0.001	bb			0.0015			8.208
IPB001	Perchlorate-O(18)	107 > 89	4.12	15705.856	15705.856	bb			0.5102	102.04	2.04	1516.2...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

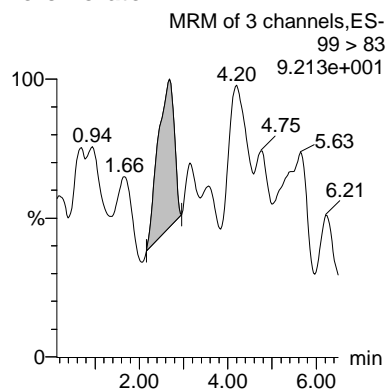
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

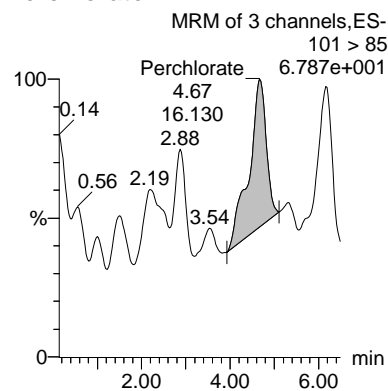
CWJ
 03/30/2017

Name: per0328002a
Date: 28-Mar-2017
Time: 17:32:12
ID: IPB001
Vial: 1:1,A

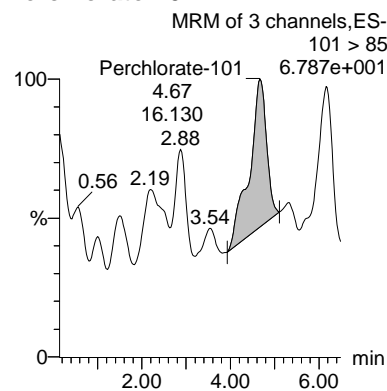
Perchlorate



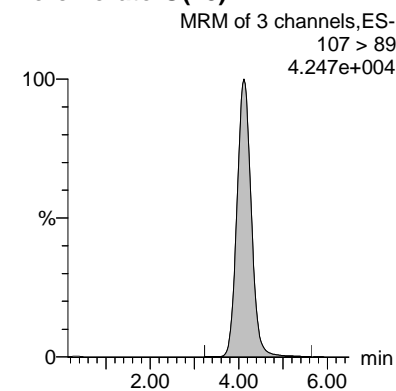
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	2.68	21.127	0.001	bb			0.0006			2.053 1.31
IPB001	Perchlorate-101	101 > 85	4.67	16.130	0.001	bb			0.0015			4.395
IPB001	Perchlorate-O(18)	107 > 89	4.12	15721.755	15721.755	bb			0.5107	102.15	2.15	1755.5...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419110Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	28-MAR-17	per0328009a	IPB002
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328009a	IPB002
Perchlorate	0.00	0	NA	28-MAR-17	per0328011a	IPB003
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328011a	IPB003
Perchlorate	0.00	0	NA	28-MAR-17	per0328024a	IPB004
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328024a	IPB004
Perchlorate	0.00	0	NA	28-MAR-17	per0328037a	IPB005
Perchlorate-101	0.00	0	NA	28-MAR-17	per0328037a	IPB005

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

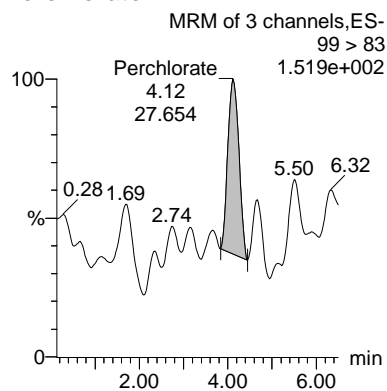
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

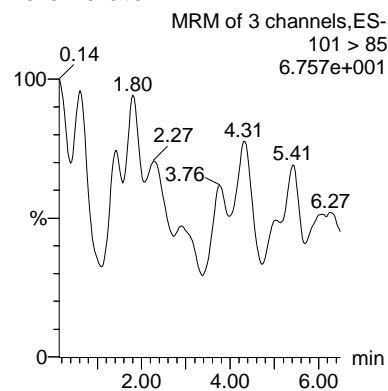
CW
 03/30/2017

Name: per0328009a
Date: 28-Mar-2017
Time: 18:38:23
ID: IPB002
Vial: 1:1,A

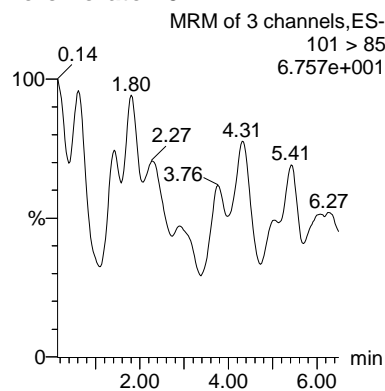
Perchlorate



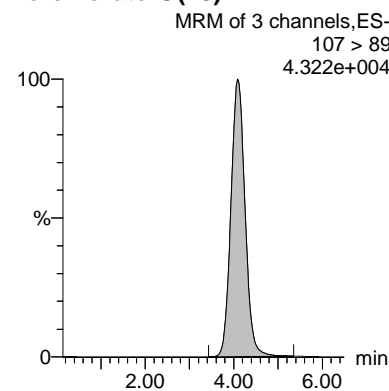
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB002	Perchlorate	99 > 83	4.12	27.654	0.001	bb			0.0008			5.988 0.00
IPB002	Perchlorate-101	101 > 85										
IPB002	Perchlorate-O(18)	107 > 89	4.09	15841.096	15841.096	bb			0.5146	102.92	2.92	2561.1...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

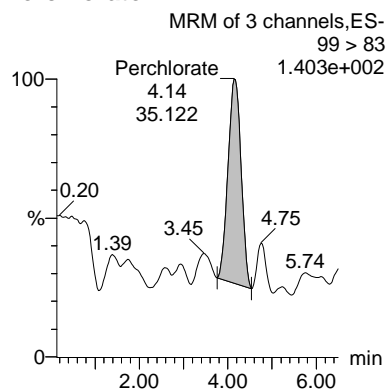
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

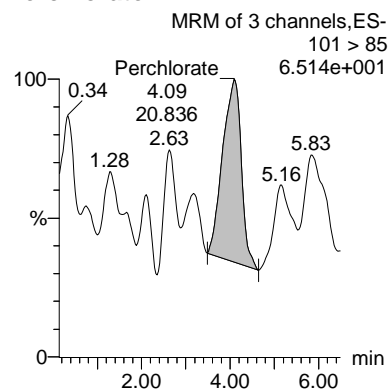
CWW
 03/30/2017

Name: per0328011a
Date: 28-Mar-2017
Time: 18:57:18
ID: IPB003
Vial: 1:1,A

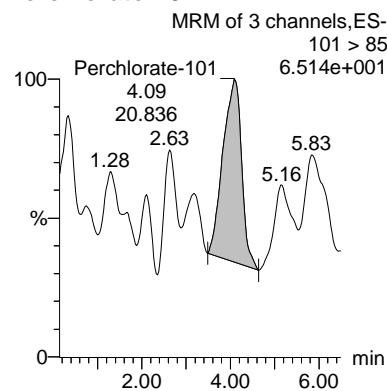
Perchlorate



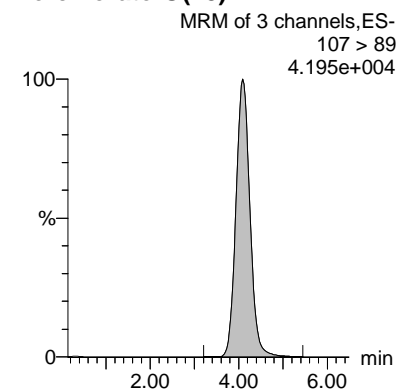
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	4.14	35.122	0.001	bb			0.0011			7.519 1.69
IPB003	Perchlorate-101	101 > 85	4.09	20.836	0.001	bb			0.0019			6.259
IPB003	Perchlorate-O(18)	107 > 89	4.09	15253.137	15253.137	bb			0.4955	99.10	-0.90	1904.9...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

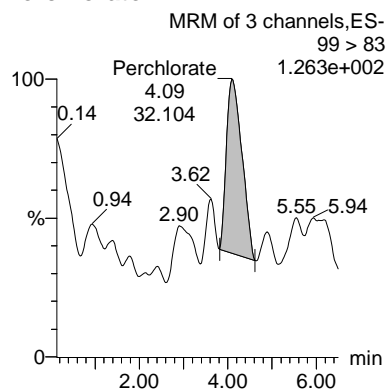
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

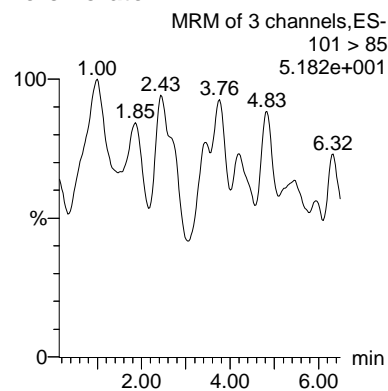
CWW
 03/30/2017

Name: per0328024a
Date: 28-Mar-2017
Time: 21:00:21
ID: IPB004
Vial: 1:1,A

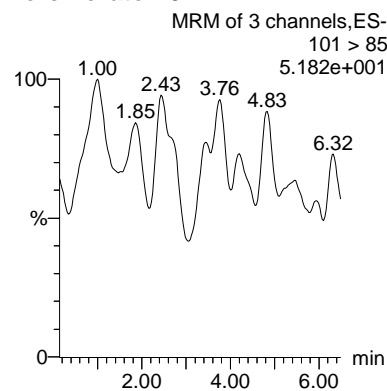
Perchlorate



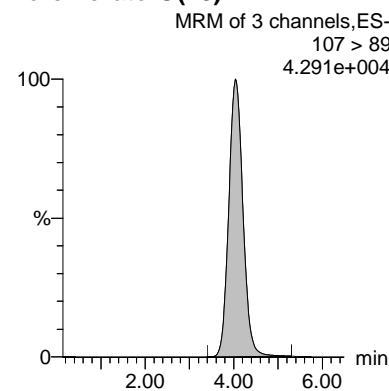
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB004	Perchlorate	99 > 83	4.09	32.104	0.001	bb			0.0010			7.179 0.00
IPB004	Perchlorate-101	101 > 85										
IPB004	Perchlorate-O(18)	107 > 89	4.03	15784.369	15784.369	bb			0.5128	102.55	2.55	2586.5...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

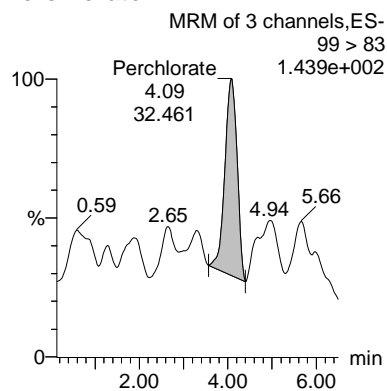
Dataset: C:\MassLynx\Perchlorate.PRO\per032817a.qld
Last Altered: Wednesday, March 29, 2017 9:31:29 AM Eastern Daylight Time
Printed: Wednesday, March 29, 2017 11:53:12 AM Eastern Daylight Time

GL
 03/29/2017

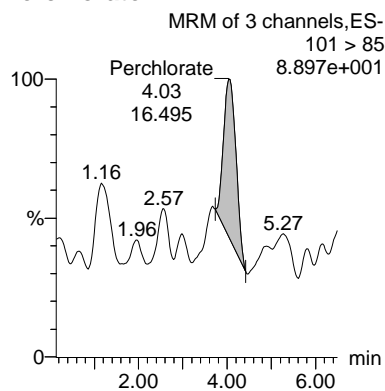
CWW
 03/30/2017

Name: per0328037a
Date: 28-Mar-2017
Time: 23:03:27
ID: IPB005
Vial: 1:1,A

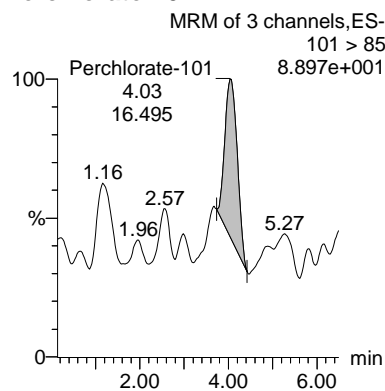
Perchlorate



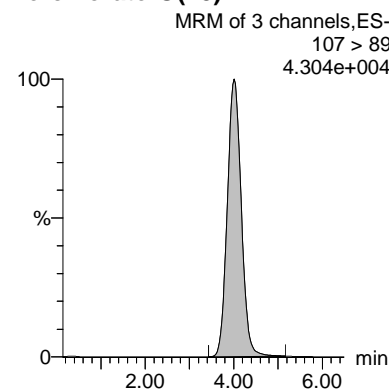
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB005	Perchlorate	99 > 83	4.09	32.461	0.001	bb			0.0010			6.871	1.97
IPB005	Perchlorate-101	101 > 85	4.03	16.495	0.001	bb			0.0015			4.416	
IPB005	Perchlorate-O(18)	107 > 89	4.01	15615.953	15615.953	bb			0.5073	101.46	1.46	2420.0...	

Miscellaneous

Prep Logbook

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1651011 Verified by: _____
 Analyst: Grace Cappelmann
 Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
 Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203755635 MB	27-MAR-2017 14:00:00	10	10	1
1203755636 LCS	27-MAR-2017 14:00:00	10	10	1
1203755639 ICS	27-MAR-2017 14:00:00	10	10	1
418938001	27-MAR-2017 14:00:00	10	10	1
1203755637 MS (418938001)	27-MAR-2017 14:00:00	10	10	1
1203755638 MSD (418938001)	27-MAR-2017 14:00:00	10	10	1
418938002	27-MAR-2017 14:00:00	10	10	1
418938003	27-MAR-2017 14:00:00	10	10	1
418938004	27-MAR-2017 14:00:00	10	10	1
418938005	27-MAR-2017 14:00:00	10	10	1
418939001	27-MAR-2017 14:00:00	10	10	1
419110001	27-MAR-2017 14:00:00	10	10	1
419111001	27-MAR-2017 14:00:00	10	10	1
419111002	27-MAR-2017 14:00:00	10	10	1
419111003	27-MAR-2017 14:00:00	10	10	1
419111004	27-MAR-2017 14:00:00	10	10	1
419111005	27-MAR-2017 14:00:00	10	10	1
419111006	27-MAR-2017 14:00:00	10	10	1
419111007	27-MAR-2017 14:00:00	10	10	1
419111008	27-MAR-2017 14:00:00	10	10	1
419111009	27-MAR-2017 14:00:00	10	10	1
419111010	27-MAR-2017 14:00:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203755639	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161107-2.5-Ba/Ag/H
LCS	1203755636	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203755637	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203755638	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/28/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per032817a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/28/17

Standard-Samp Reagent Lot#.: 2457559

Alt Check Std. ID: WCL170320-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0328001a	IPB001	GXC1	3/28/2017 17:22			1		USE	B
per0328002a	IPB001	GXC1	3/28/2017 17:32			1		USE	B
per0328003a	WCLICAL-01	GXC1	3/28/2017 17:41			1		USE	I
per0328004a	WCLICAL-02	GXC1	3/28/2017 17:51			1		USE	I
per0328005a	WCLICAL-03	GXC1	3/28/2017 18:00			1		USE	I
per0328006a	WCLICAL-04	GXC1	3/28/2017 18:10			1		USE	I
per0328007a	WCLICAL-05	GXC1	3/28/2017 18:19			1		USE	I
per0328008a	WCLICAL-06	GXC1	3/28/2017 18:28			1		USE	I
per0328009a	IPB002	GXC1	3/28/2017 18:38			1		USE	B
per0328010a	WCLICV	GXC1	3/28/2017 18:47			1		USE	C
per0328011a	IPB003	GXC1	3/28/2017 18:57			1		USE	B
per0328012a	WCLCRI	GXC1	3/28/2017 19:06			1		USE	C
per0328013a	1203755635	GXC1	3/28/2017 19:16	1651013	Various	1	MBAC	USE	S
per0328014a	1203755636	GXC1	3/28/2017 19:25	1651013	Various	1	MBAC	USE	S
per0328015a	1203755639	GXC1	3/28/2017 19:35	1651013	Various	1	MBAC	USE	S
per0328016a	418938001	GXC1	3/28/2017 19:44	1651013	418938	5	MBAC	USE	S
per0328017a	1203755637	GXC1	3/28/2017 19:54	1651013	418938	5	MBAC	USE	S
per0328018a	1203755638	GXC1	3/28/2017 20:03	1651013	418938	5	MBAC	USE	S
per0328019a	418938002	GXC1	3/28/2017 20:12	1651013	418938	1	MBAC	USE	S
per0328020a	418938003	GXC1	3/28/2017 20:22	1651013	418938	1	MBAC	USE	S
per0328021a	418938004	GXC1	3/28/2017 20:31	1651013	418938	1	MBAC	USE	S
per0328022a	418938005	GXC1	3/28/2017 20:41	1651013	418938	1	MBAC	USE	S
per0328023a	WCLCCV	GXC1	3/28/2017 20:50			1		USE	C
per0328024a	IPB004	GXC1	3/28/2017 21:00			1		USE	B
per0328025a	WCLCRI	GXC1	3/28/2017 21:09			1		USE	C
per0328026a	418939001	GXC1	3/28/2017 21:19	1651013	418939	1	MBAC	USE	S
per0328027a	419110001	GXC1	3/28/2017 21:28	1651013	419110	5	MBAC	USE	S
per0328028a	419111001	GXC1	3/28/2017 21:38	1651013	419111	1	MBAC	USE	S
per0328029a	419111002	GXC1	3/28/2017 21:47	1651013	419111	1	MBAC	USE	S

per0328030a	419111003	GXC1	3/28/2017 21:57	1651013	419111	2000	MBAC	USE	S
per0328031a	419111004	GXC1	3/28/2017 22:06	1651013	419111	1	MBAC	USE	S
per0328032a	419111005	GXC1	3/28/2017 22:16	1651013	419111	1	MBAC	USE	S
per0328033a	419111006	GXC1	3/28/2017 22:25	1651013	419111	1	MBAC	USE	S
per0328034a	419111007	GXC1	3/28/2017 22:35	1651013	419111	1	MBAC	USE	S
per0328035a	419111008	GXC1	3/28/2017 22:44	1651013	419111	1	MBAC	USE	S
per0328036a	WCLCCV	GXC1	3/28/2017 22:53			1		USE	C
per0328037a	IPB005	GXC1	3/28/2017 23:03			1		USE	B
per0328038a	WCLCRI	GXC1	3/28/2017 23:12			1		USE	C
per0328039a	419111009	GXC1	3/28/2017 23:22	1651013	419111	1	MBAC	USE	S
per0328040a	419111010	GXC1	3/28/2017 23:31	1651013	419111	1	MBAC	USE	S
per0328041a	IPB006	GXC1	3/28/2017 23:41			1		USE	B
per0328042a	1203756791	GXC1	3/28/2017 23:50	1651435	2017-1250	1	ARSL	USE	S
per0328043a	1203756792	GXC1	3/29/2017 0:00	1651435	2017-1250	1	ARSL	USE	S
per0328044a	1203756795	GXC1	3/29/2017 0:09	1651435	2017-1250	1	ARSL	USE	S
per0328045a	419173001	GXC1	3/29/2017 0:19	1651435	2017-1250	1	ARSL	USE	S
per0328046a	1203756793	GXC1	3/29/2017 0:28	1651435	2017-1250	1	ARSL	USE	S
per0328047a	1203756794	GXC1	3/29/2017 0:38	1651435	2017-1250	1	ARSL	USE	S
per0328048a	WCLCCV	GXC1	3/29/2017 0:47			1		USE	C
per0328049a	IPB007	GXC1	3/29/2017 0:57			1		USE	B
per0328050a	WCLCRI	GXC1	3/29/2017 1:06			1		USE	C

DATA EXCEPTION REPORT

Mo.Day Yr. 29-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1651013	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 418938,418939,419110,419111			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. In 1203755637 (MS) and 1203755638 (MSD) a 0% recovery of Perchlorate was observed. The acceptance range is 75-125%. The detected concentrations in the MS and MSD were lower than the detected concentration in the parent sample.		1. The outliers observed for the matrix spikes were due to the background concentration in the parent sample, 418938001 (18WW08-032017) and the need of a 1:5 dilution prior to analysis. Will report data and note in case narrative.	

Originator's Name:

Grace Cappelmann 29-MAR-17

Data Validator/Group Leader:

Charles Wilson 30-MAR-17

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



March 30, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 419533

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 30, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Linda Pullano for
Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	45
Miscellaneous.....	66

Case Narrative

Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 419533

March 30, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 30, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

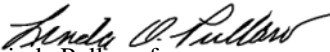
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
419533001	LH18/24-SP650-6428-GRAB

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.


Linda Pullano for
Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

419533

CHAIN OF CUSTODY

Name Of Lab Shipping To: GEL Laboratories (843) 556-8171 ATTN: HOPE TAYLOR

Project: AECOM LONGHORN ARMY AMMIN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No. 60256135.GWTPT HRUMAR16	Analyses PERCHLORATE	Remarks (Preservatives, etc.) NONE	Lab I.D.#
Job: GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES		No. OF CONTAINERS 1			
Prepared By: Scott Beesinger		P. O. Number	MS / MSD	Date / Time 03/29/17 / 15:00	Field Sample I.D. LH18/24-SP650-6428-GRAB
Sample Matrix Water	Date / Time 03/29/17 / 15:00	Date 3/30/17	Time 0930	Relinquished By:	Date 3/30/17
Received By: <i>Scott Beesinger</i>	Date 03/29/17	Time 15:45	Received By: <i>Ashley Stahl</i>	Date 3/30/17	Time 0930
Additional Remarks: 24 HR. TURN AROUND TIME					

Received At Lab By:		Date	Time	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition
For Lab Use Only									
Remarks:									

SAMPLE RECEIPT & REVIEW FORM

Client: <u>MBAC</u>		SDG/AR/COC/Work Order: <u>919533</u>		
Received By: <u>AG</u>		Date Received: <u>03/30/17</u>		
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other <u>J461 688 223 8</u>		
Suspected Hazard Information		Yes No *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
Shipped as a DOT Hazardous?		Hazard Class Shipped: _____ UN#: _____		
COC/Samples marked as radioactive?		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> / mR/Hr Classified as: Rad 1 Rad 2 Rad 3		
Is package, COC, and/or Samples marked HAZ?		If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____		
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	/			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	/			
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	/			Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1</u>
4 Daily check performed and passed on IR temperature gun?	/			Temperature Device Serial #: <u>IR2-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	/			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	/			Sample ID's and Containers Affected: If Preservation added Lot#: _____
7 Do any samples require Volatile Analysis?	/			If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected: _____
8 Samples received within holding time?	/			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	/			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	/			Sample ID's affected:
11 Number of containers received match number indicated on COC?	/			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	/			
13 COC form is properly signed in relinquished/received sections?	/			
Comments (Use Continuation Form if needed):				

PM (or PMA) review: Initials AG Date 3/30/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 30 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
 Technical Case Narrative
 Microbac Laboratories, Inc Kentucky Division (MBAC)
 SDG #: 419533**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1652086

Prep Batch Number: 1652084

Sample Analysis

Sample ID	Client ID
419533001	419533001 (LH18/24-SP650-6428-GRAB)
1203758666	Interference Check Sample (ICS)
1203758384	Method Blank (MB)
1203758386	Laboratory Control Sample (LCS)
1203758388	419533001(LH18/24-SP650-6428-GRAB) Matrix Spike (MS)
1203758390	419533001(LH18/24-SP650-6428-GRAB) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 419533001 (LH18/24-SP650-6428-GRAB) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203758390 (MSD) a 0% recovery was observed, which is out of the acceptance range of 75-125%. The detected concentration in the MSD was lower than that detected in the parent sample. The outlier observed for the MSD was due to the background concentration in the parent sample, 419533001 (LH18/24-SP650-6428-GRAB) and the need of a 1:4 dilution prior to analysis. 1203758390 (LH18/24-SP650-6428-GRABMSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based

on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203758388 (LH18/24-SP650-6428-GRABMS), 1203758390 (LH18/24-SP650-6428-GRABMSD) and 419533001 (LH18/24-SP650-6428-GRAB) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1619472 was generated for sample 1203758390 (LH18/24-SP650-6428-GRABMSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 419533 GEL Work Order: 419533

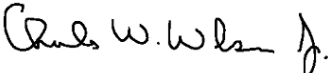
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 31 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRAB

Date Received: 30-MAR-17

GEL Job No (SDG): 419533

GEL Sample ID: 419533001

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	3.86	ug/L		4	30-MAR-17 21:18	per0330026a
	Perchlorate-O(18)			1.60	ug/L		4	30-MAR-17 21:18	per0330026a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 419533

Extract Batch Code: 1652084

Date Filtered: 30-MAR-17

Matrix: WATER

Sample ID: 1203758386

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate-O(18)		.335	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 419533Extract Batch Code: 1652084Date Filtered: 30-MAR-17Matrix: WATERSample ID: 1203758666

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.205	ug/L	103		70 - 130
Perchlorate-O(18)		.343	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 419533Extract Batch Code: 1652084Date Extracted: 30-MAR-17GEL MS/PS ID: 1203758388Client ID: LH18/24-SP650-6428-GRABGEL MSD/PSD ID: 1203758390QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	3.86	ug/L	4.03	87	3.78	0 *	6	30	75 - 125
Perchlorate-O(18)	0	1.60	ug/L	1.43		1.28		11		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0330006a	30-MAR-17	16903.4				
Lower Area Limit			8451.7				
Upper Area Limit			25355.1				
1203758384	per0330013a	30-MAR-17 19:15	16143.3	3.84	3.89552	1.014	
1203758386	per0330014a	30-MAR-17 19:24	10789.5	3.84	3.868	1.007	
1203758666	per0330015a	30-MAR-17 19:34	11043.4	3.79	3.81283	1.006	
419533001	per0330026a	30-MAR-17 21:18	12854.2	3.81	3.84035	1.008	
1203758388	per0330027a	30-MAR-17 21:28	11537.1	3.84	3.868	1.007	
1203758390	per0330028a	30-MAR-17 21:37	10330	3.84	3.868	1.007	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRAB

Date Received: 30-MAR-17

GEL Job No (SDG): 419533

GEL Sample ID: 419533001

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	3.86	ug/L		4	30-MAR-17 21:18	per0330026a
	Perchlorate-O(18)			1.60	ug/L		4	30-MAR-17 21:18	per0330026a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

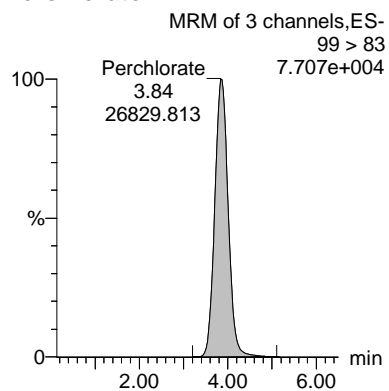
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

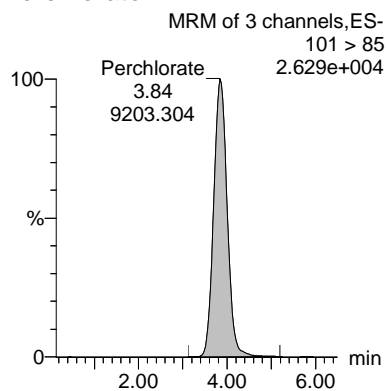
CW
 03/31/2017

Name: per0330026a
Date: 30-Mar-2017
Time: 21:18:48
ID: 419533001
Vial: 1:4,D

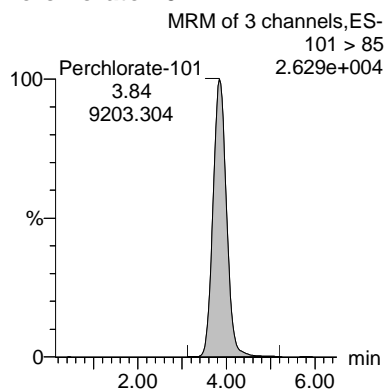
Perchlorate



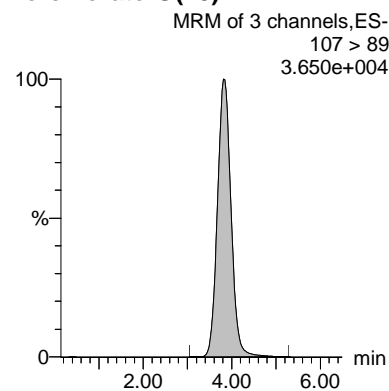
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
419533001	Perchlorate	99 > 83	3.84	26829.813	1.044	bb			0.9641			4309.3... 2.92
419533001	Perchlorate-101	101 > 85	3.84	9203.304	0.358	bb			1.0024			1355.9...
419533001	Perchlorate-O(18)	107 > 89	3.81	12854.187	12854.187	bb			0.3996	79.92	-20.08	4800.6...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419533

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 30-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate

Coefficient of Determination: .

Calibration Curve: 1.08167

Response Type: Internal Standard

Curve Type: RF

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419533

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 30-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .35667

Response Type: Internal Standard

Curve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

GL
03/31/2017CW
03/31/2017

Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time

Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per033017a.mdb 31 Mar 2017 09:14:12**Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per033017a.cdb 31 Mar 2017 09:15:51**

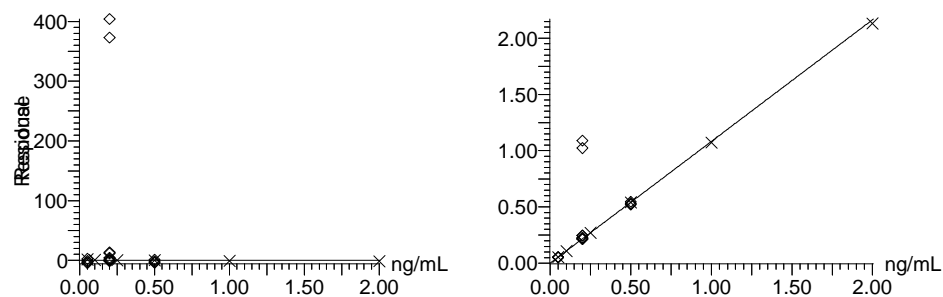
Compound name: Perchlorate

Response Factor: 1.08246

RRF SD: 0.0119871, % Relative SD: 1.10739

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



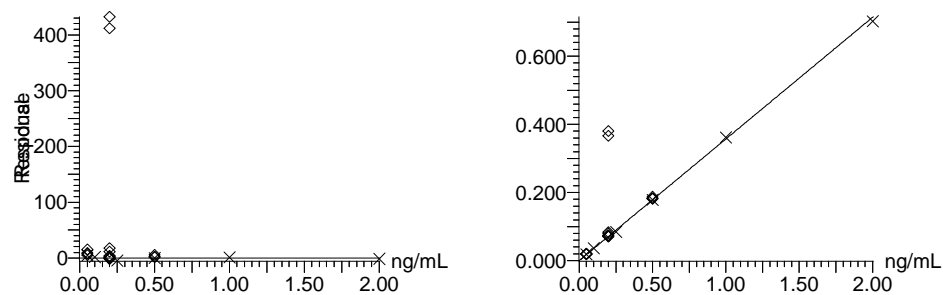
Compound name: Perchlorate-101

Response Factor: 0.357128

RRF SD: 0.0113044, % Relative SD: 3.16535

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time

Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

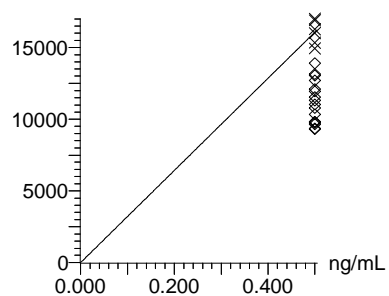
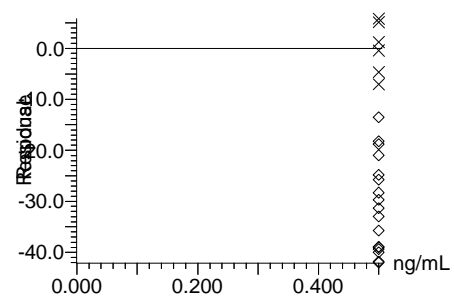
Compound name: Perchlorate-O(18)

Response Factor: 32167

RRF SD: 1659.85, % Relative SD: 5.16011

Response type: External Std, Area

Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

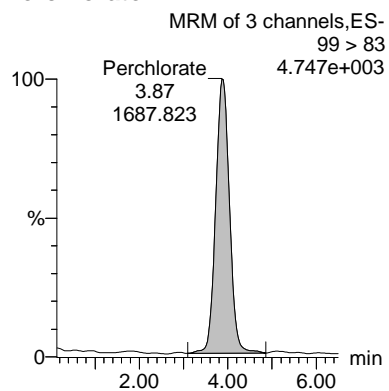
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

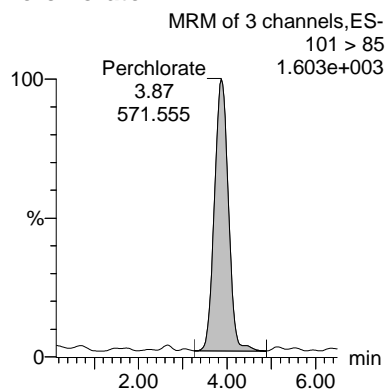
CWW
 03/31/2017

Name: per0330003a
Date: 30-Mar-2017
Time: 17:40:34
ID: WCL170320-01
Vial: 1:1,B

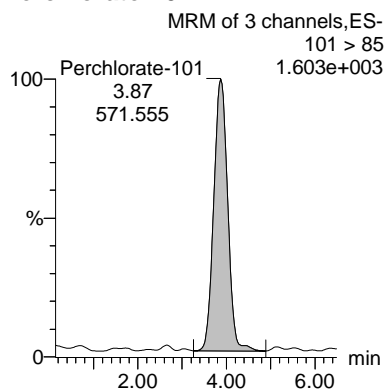
Perchlorate



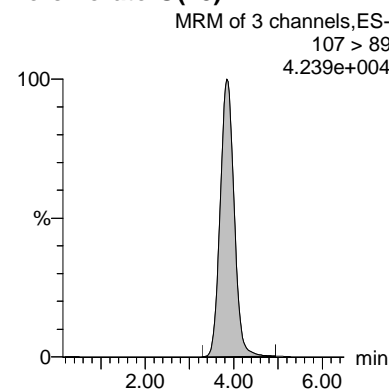
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-01	Perchlorate	99 > 83	3.87	1687.823	0.055	bb			0.0508	101.68	1.68	362.740	2.95
WCL170320-01	Perchlorate-101	101 > 85	3.87	571.555	0.019	bb			0.0522	104.37	4.37	129.625	
WCL170320-01	Perchlorate-O(18)	107 > 89	3.84	15334.690	15334.690	bb			0.4767	95.34	-4.66	5010.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

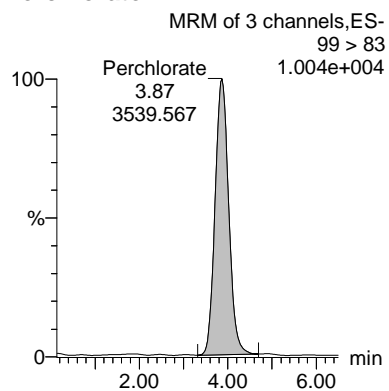
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

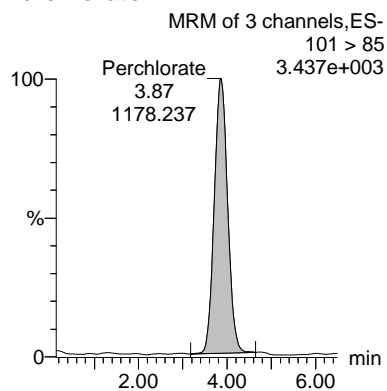
CWW
 03/31/2017

Name: per0330004a
Date: 30-Mar-2017
Time: 17:50:03
ID: WCL170320-02
Vial: 1:1,C

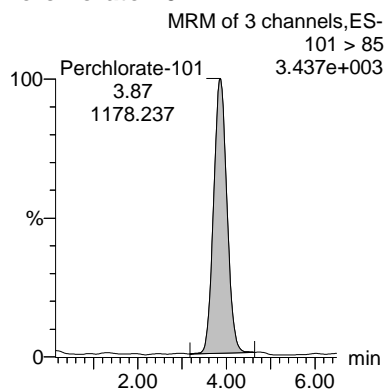
Perchlorate



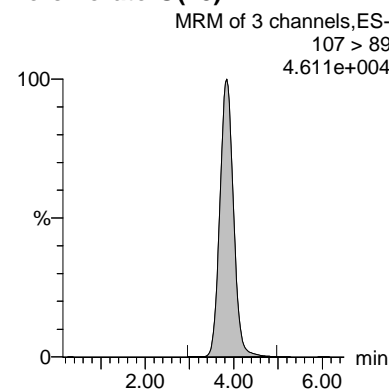
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-02	Perchlorate	99 > 83	3.87	3539.567	0.109	bb			0.1004	100.41	0.41	504.214	3.00
WCL170320-02	Perchlorate-101	101 > 85	3.87	1178.237	0.036	bb			0.1013	101.31	1.31	367.927	
WCL170320-02	Perchlorate-O(18)	107 > 89	3.84	16282.772	16282.772	bb			0.5062	101.24	1.24	3191.1...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

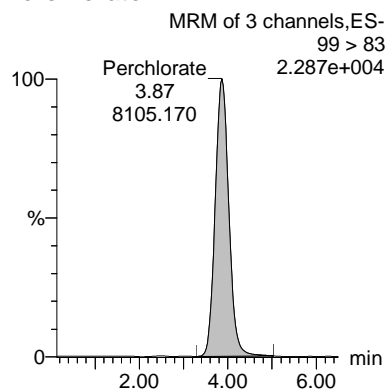
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

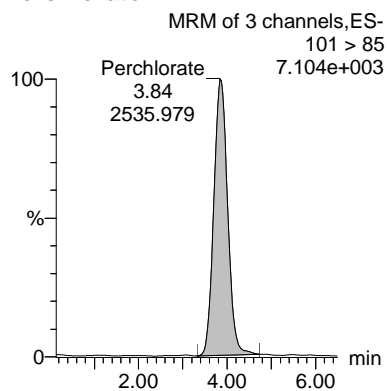
CWW
 03/31/2017

Name: per0330005a
 Date: 30-Mar-2017
 Time: 17:59:32
 ID: WCL170320-03
 Vial: 1:1,D

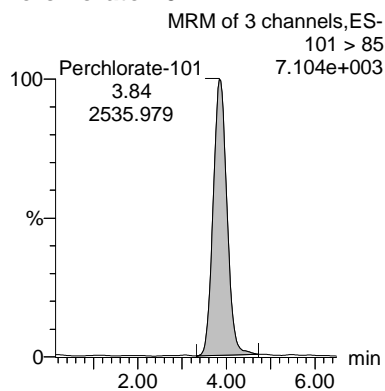
Perchlorate



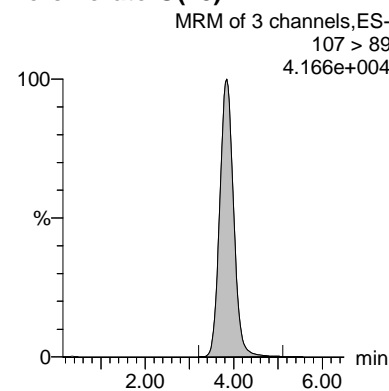
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-03	Perchlorate	99 > 83	3.87	8105.170	0.271	bb			0.2504	100.18	0.18	1617.0...	3.20
WCL170320-03	Perchlorate-101	101 > 85	3.84	2535.979	0.085	bb			0.2375	95.00	-5.00	876.314	
WCL170320-03	Perchlorate-O(18)	107 > 89	3.84	14949.227	14949.227	bb			0.4647	92.95	-7.05	6953.4...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

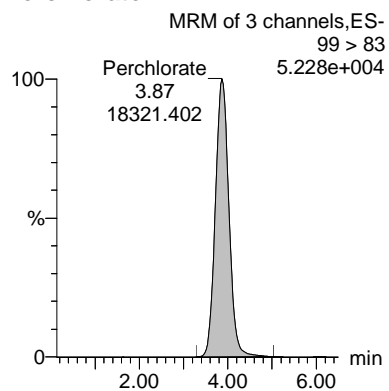
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

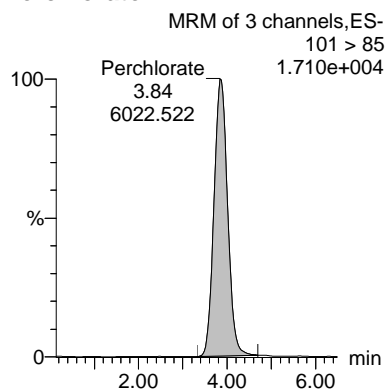
CWW
 03/31/2017

Name: per0330006a
Date: 30-Mar-2017
Time: 18:09:02
ID: WCL170320-04
Vial: 1:1,E

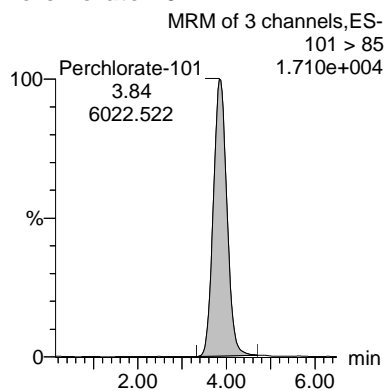
Perchlorate



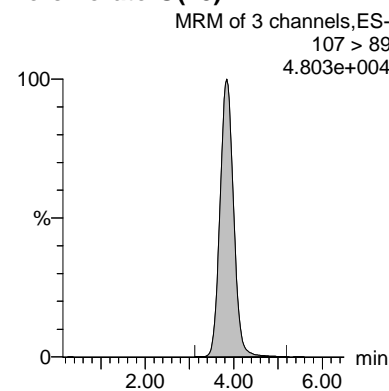
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
WCL170320-04	Perchlorate	99 > 83	3.87	18321.402	0.542	bb			0.5007	100.13	0.13	4402.0...
WCL170320-04	Perchlorate-101	101 > 85	3.84	6022.522	0.178	bb			0.4988	99.77	-0.23	4014.3...
WCL170320-04	Perchlorate-O(18)	107 > 89	3.84	16903.424	16903.424	bb			0.5255	105.10	5.10	3450.4...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

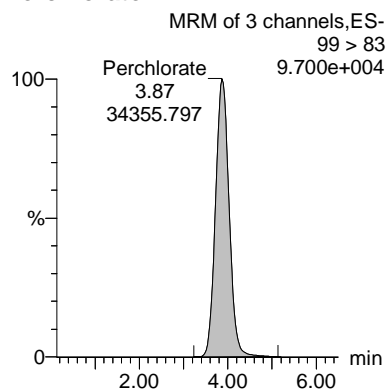
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

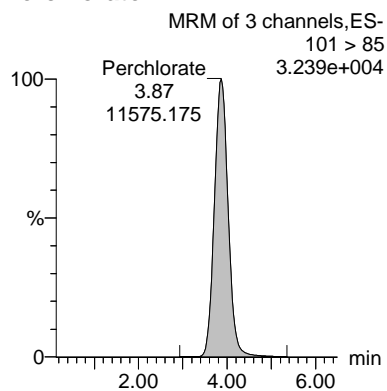
CW
 03/31/2017

Name: per0330007a
Date: 30-Mar-2017
Time: 18:18:30
ID: WCL170320-05
Vial: 1:1,F

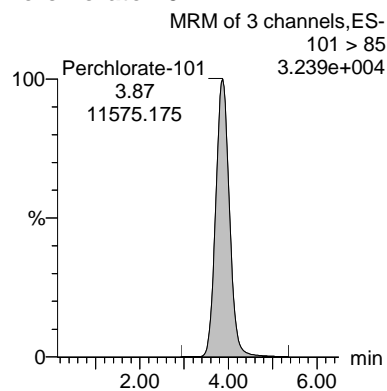
Perchlorate



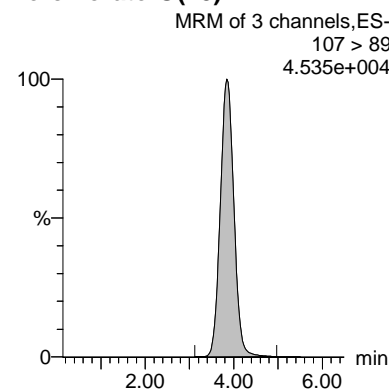
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-05	Perchlorate	99 > 83	3.87	34355.797	1.073	bb			0.9912	99.12	-0.88	6395.5...	2.97
WCL170320-05	Perchlorate-101	101 > 85	3.87	11575.175	0.362	bb			1.0123	101.23	1.23	1935.8...	
WCL170320-05	Perchlorate-O(18)	107 > 89	3.84	16009.761	16009.761	bb			0.4977	99.54	-0.46	4708.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

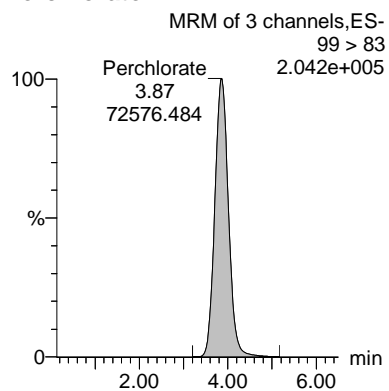
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

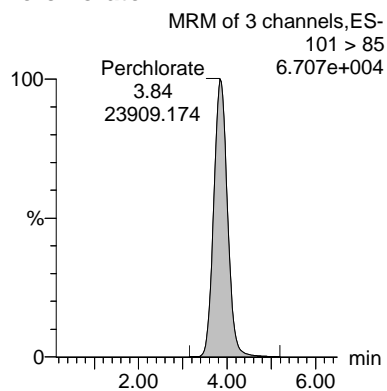
CWW
 03/31/2017

Name: per0330008a
Date: 30-Mar-2017
Time: 18:27:56
ID: WCL170320-06
Vial: 1:2,A

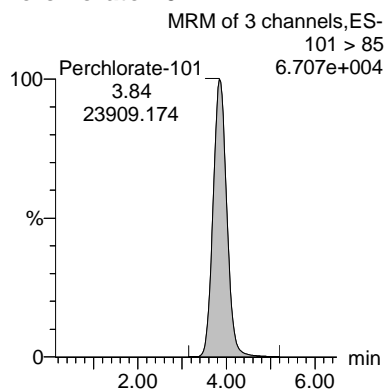
Perchlorate



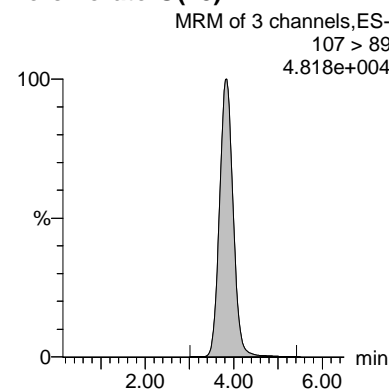
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-06	Perchlorate	99 > 83	3.87	72576.484	2.132	bb			1.9695	98.48	-1.52	10445....	3.04
WCL170320-06	Perchlorate-101	101 > 85	3.84	23909.174	0.702	bb			1.9666	98.33	-1.67	5705.7...	
WCL170320-06	Perchlorate-O(18)	107 > 89	3.84	17021.146	17021.146	bb			0.5291	105.83	5.83	4521.2...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.08	30-MAR-17 18:46	per0330010a
Perchlorate Isotope Ratio		2.87		30-MAR-17 18:46	per0330010a
Perchlorate-101	.5	.51	102.36	30-MAR-17 18:46	per0330010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

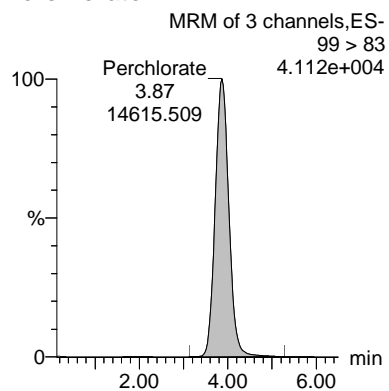
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

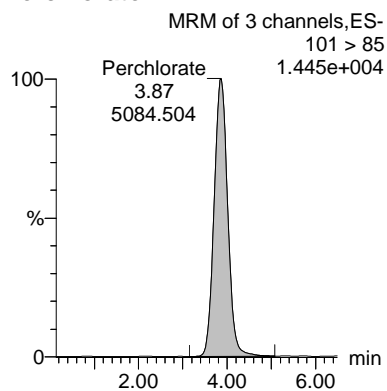
CWW
 03/31/2017

Name: per0330010a
Date: 30-Mar-2017
Time: 18:46:56
ID: WCL170320-07ICV
Vial: 1:2,B

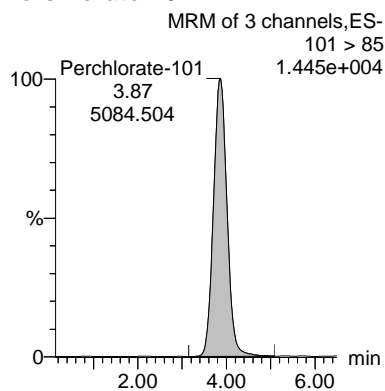
Perchlorate



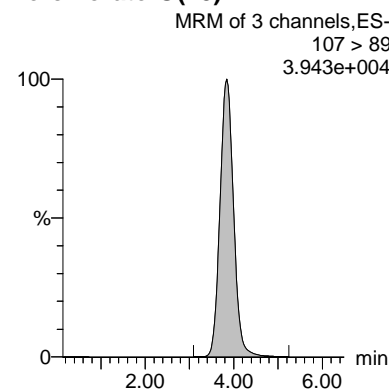
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07ICV	Perchlorate	99 > 83	3.87	14615.509	0.525	bb			0.4854	97.08	-2.92	1140.6...	2.87
WCL170320-07ICV	Perchlorate-101	101 > 85	3.87	5084.504	0.183	bb			0.5118	102.36	2.36	2169.7...	
WCL170320-07ICV	Perchlorate-O(18)	107 > 89	3.84	13908.722	13908.722	bb			0.4324	86.48	-13.52	4252.3...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.48	95.97	30-MAR-17 20:50	per0330023a
Perchlorate Isotope Ratio		2.85		30-MAR-17 20:50	per0330023a
Perchlorate-101	.5	.51	102.04	30-MAR-17 20:50	per0330023a
Perchlorate	.5	.49	98.4	30-MAR-17 22:53	per0330036a
Perchlorate Isotope Ratio		2.93		30-MAR-17 22:53	per0330036a
Perchlorate-101	.5	.51	101.73	30-MAR-17 22:53	per0330036a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

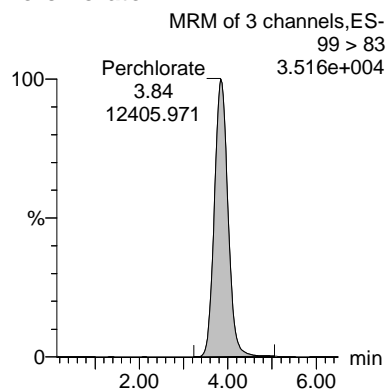
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

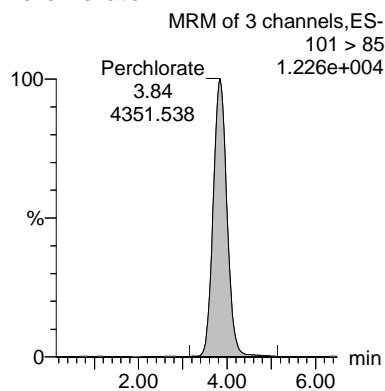
CWW
 03/31/2017

Name: per0330023a
Date: 30-Mar-2017
Time: 20:50:21
ID: WCL170320-07CCV
Vial: 1:2,B

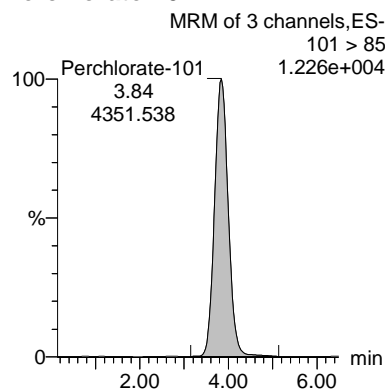
Perchlorate



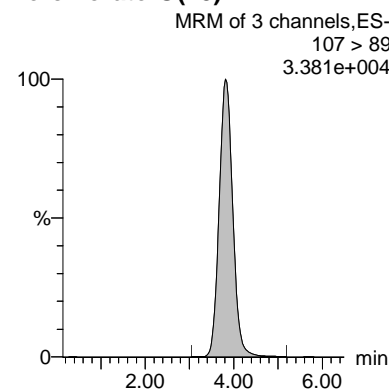
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	3.84	12405.971	0.519	bb			0.4799	95.97	-4.03	595.179	2.85
WCL170320-07CCV	Perchlorate-101	101 > 85	3.84	4351.538	0.182	bb			0.5102	102.04	2.04	2084.4...	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	3.81	11941.714	11941.714	bb			0.3712	74.25	-25.75	6627.1...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

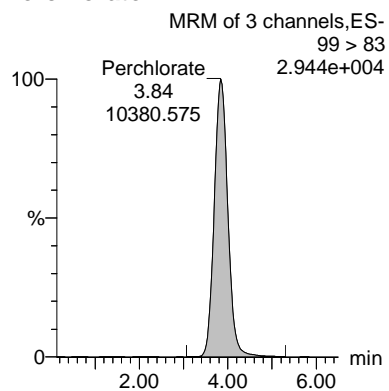
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

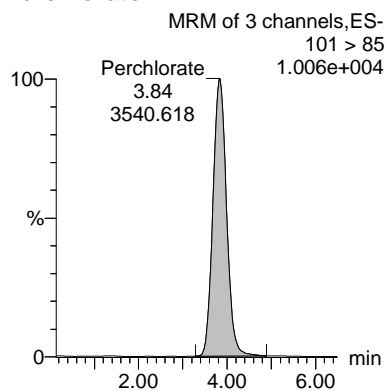
CWW
 03/31/2017

Name: per0330036a
Date: 30-Mar-2017
Time: 22:53:39
ID: WCL170320-07CCV
Vial: 1:2,B

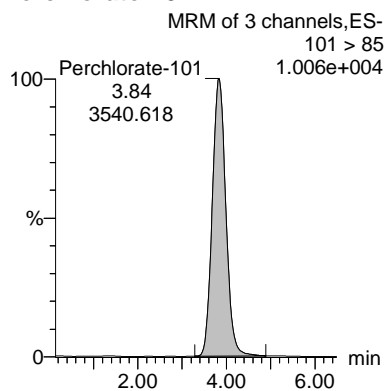
Perchlorate



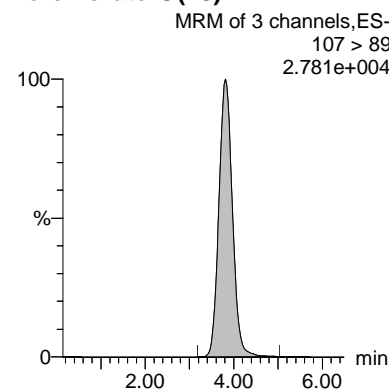
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	3.84	10380.575	0.533	bb			0.4920	98.40	-1.60	2603.2...	2.93
WCL170320-07CCV	Perchlorate-101	101 > 85	3.84	3540.618	0.182	bb			0.5087	101.73	1.73	1935.8...	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	3.81	9745.502	9745.502	bb			0.3030	60.59	-39.41	2322.1...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	95.45	30-MAR-17 19:05	per0330012a
Perchlorate Isotope Ratio		2.66		30-MAR-17 19:05	per0330012a
Perchlorate-101	.05	.05	108.78	30-MAR-17 19:05	per0330012a
Perchlorate	.05	.05	102.42	30-MAR-17 21:09	per0330025a
Perchlorate Isotope Ratio		2.96		30-MAR-17 21:09	per0330025a
Perchlorate-101	.05	.05	104.74	30-MAR-17 21:09	per0330025a
Perchlorate	.05	.05	98.83	30-MAR-17 23:12	per0330038a
Perchlorate Isotope Ratio		2.8		30-MAR-17 23:12	per0330038a
Perchlorate-101	.05	.05	106.99	30-MAR-17 23:12	per0330038a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

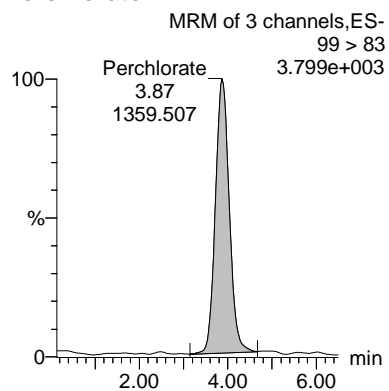
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

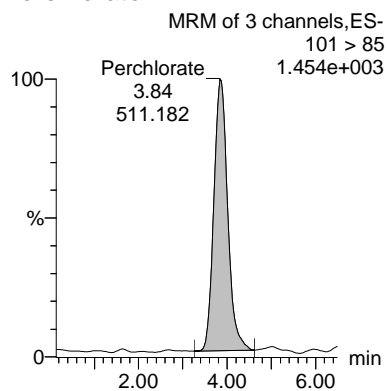
CWW
 03/31/2017

Name: per0330012a
Date: 30-Mar-2017
Time: 19:05:55
ID: WCL170320-08CRI
Vial: 1:2,C

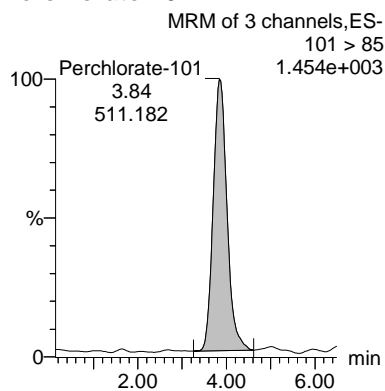
Perchlorate



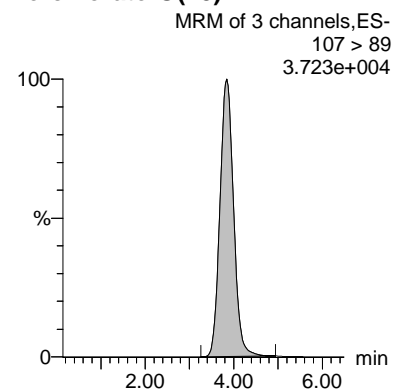
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.87	1359.507	0.052	bb			0.0477	95.45	-4.55	306.198	2.66
WCL170320-08CRI	Perchlorate-101	101 > 85	3.84	511.182	0.019	bb			0.0544	108.78	8.78	135.066	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.84	13157.903	13157.903	bb			0.4090	81.81	-18.19	1004.8...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 25 of 49

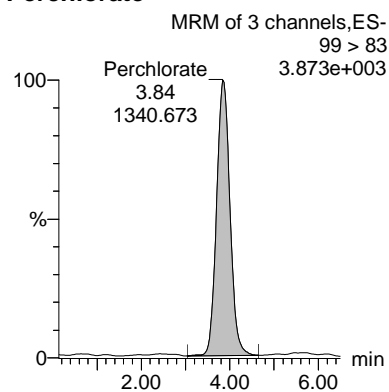
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

GL
03/31/2017CW
03/31/2017

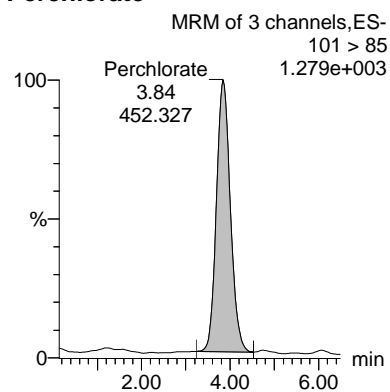
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

Name: per0330025a
Date: 30-Mar-2017
Time: 21:09:20
ID: WCL170320-08CRI
Vial: 1:2,C

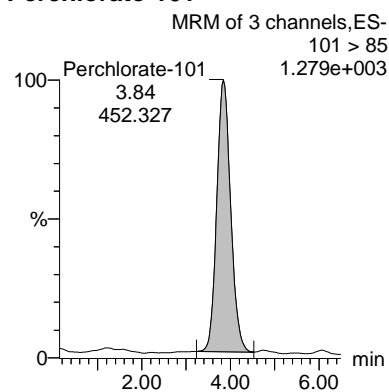
Perchlorate



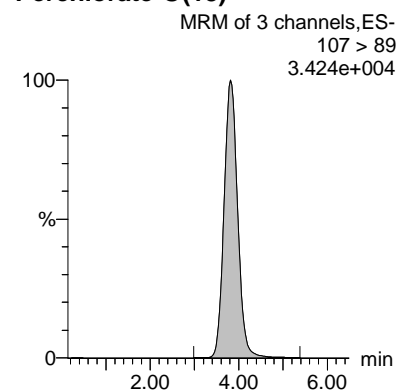
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.84	1340.673	0.055	bb			0.0512	102.42	2.42	559.474	2.96
WCL170320-08CRI	Perchlorate-101	101 > 85	3.84	452.327	0.019	bb			0.0524	104.74	4.74	230.715	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.81	12092.929	12092.929	bb			0.3759	75.19	-24.81	882.489	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

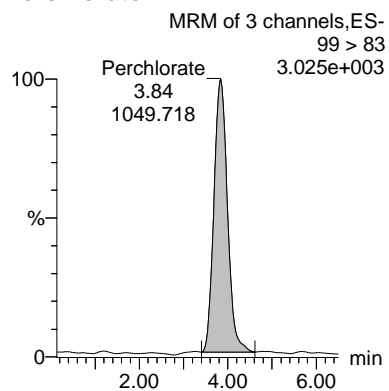
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

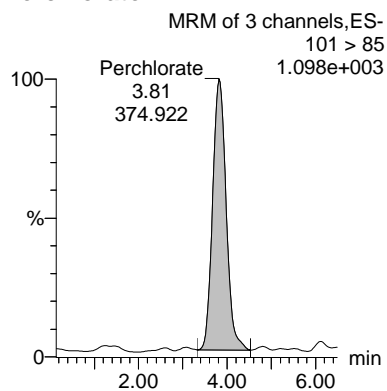
CWW
 03/31/2017

Name: per0330038a
Date: 30-Mar-2017
Time: 23:12:35
ID: WCL170320-08CRI
Vial: 1:2,C

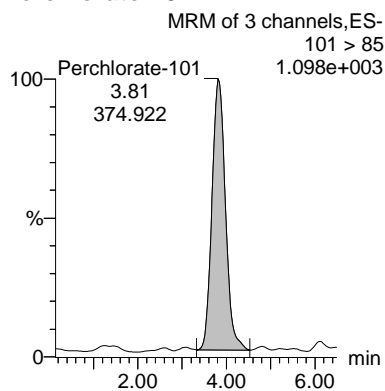
Perchlorate



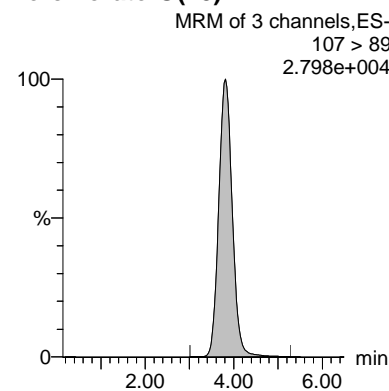
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.84	1049.718	0.053	bb			0.0494	98.83	-1.17	271.756	2.80
WCL170320-08CRI	Perchlorate-101	101 > 85	3.81	374.922	0.019	bb			0.0535	106.99	6.99	88.129	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.81	9811.959	9811.959	bb			0.3050	61.01	-38.99	3900.5...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1652084Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 30-MAR-17GEL Job No (SDG): 419533GEL Sample ID: 1203758384Date Filtered: 30-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	30-MAR-17 19:15	per0330013a
	Perchlorate-O(18)			0.502	ug/L		1	30-MAR-17 19:15	per0330013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

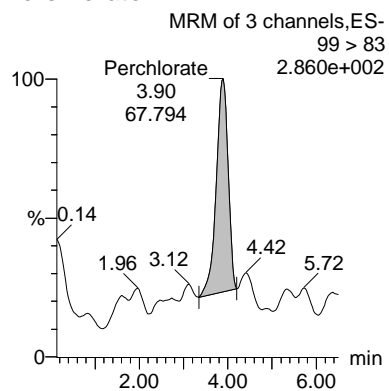
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

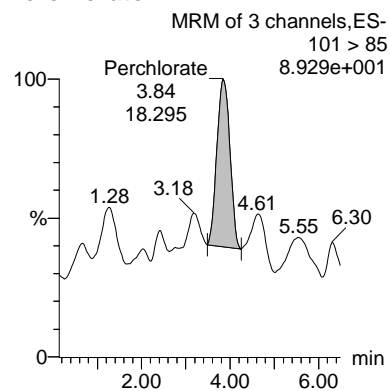
CW
 03/31/2017

Name: per0330013a
Date: 30-Mar-2017
Time: 19:15:25
ID: 1203758384
Vial: 1:3,A

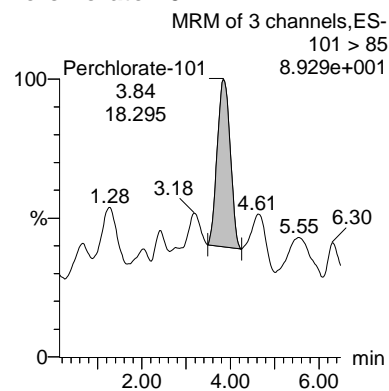
Perchlorate



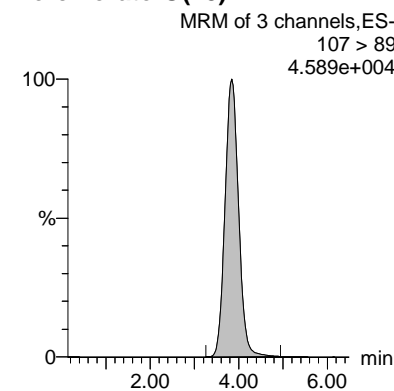
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203758384	Perchlorate	99 > 83	3.90	67.794	0.002	bb			0.0019			14.479 3.71
1203758384	Perchlorate-101	101 > 85	3.84	18.295	0.001	bb			0.0016			3.985
1203758384	Perchlorate-O(18)	107 > 89	3.84	16143.255	16143.255	bb			0.5019	100.37	0.37	2439.0...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 30-MAR-17

GEL Job No (SDG): 419533

GEL Sample ID: 1203758386

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	30-MAR-17 19:24	per0330014a
	Perchlorate-O(18)			0.335	ug/L		1	30-MAR-17 19:24	per0330014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report **MassLynx 4.0 SP4**
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 1

Dataset: Untitled

GL
 03/31/2017

CWW
 03/31/2017

Last Altered: Friday, March 31, 2017 12:57:05 PM Eastern Daylight Time

Printed: Friday, March 31, 2017 12:58:35 PM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PROMethDB\per032217a.mdb 31 Mar 2017 09:14:12

Calibration: 31 Mar 2017 12:57:04

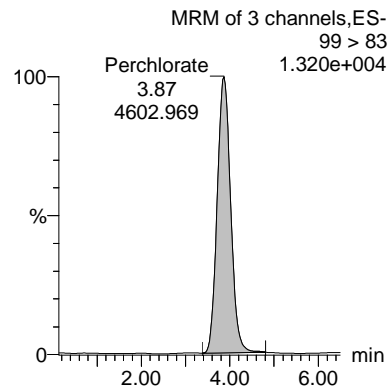
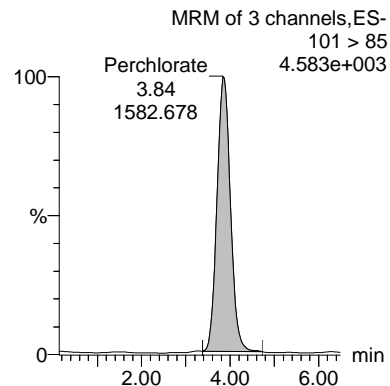
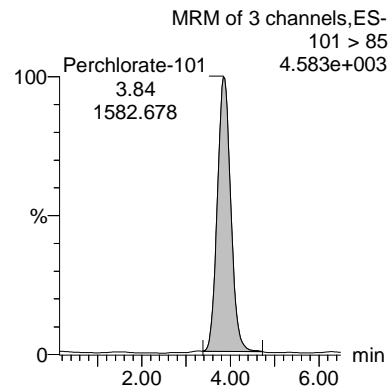
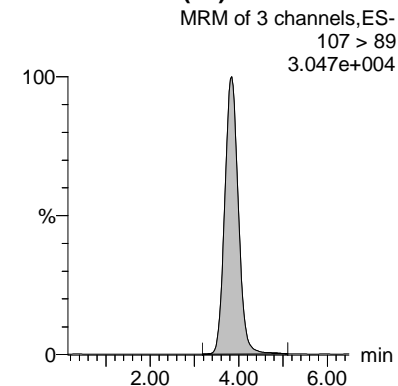
Name: per0330014a

Date: 30-Mar-2017

Time: 19:24:55

ID: 1203758386

Vial: 1:3,B

Perchlorate**Perchlorate****Perchlorate-101****Perchlorate-O(18)**

ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203758386	Perchlorate	99 > 83	3.87	4602.969	0.213	bb			0.1971	98.53	-1.47	767.790 2.91
1203758386	Perchlorate-101	101 > 85	3.84	1582.678	0.073	bb			0.2054	102.69	2.69	917.385
1203758386	Perchlorate-O(18)	107 > 89	3.84	10789.488	10789.488	bb			0.3354	67.08	-32.92	1841.5...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 419533

GEL Sample ID: 1203758666

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.205	ug/L		1	30-MAR-17 19:34	per0330015a
	Perchlorate-O(18)			0.343	ug/L		1	30-MAR-17 19:34	per0330015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

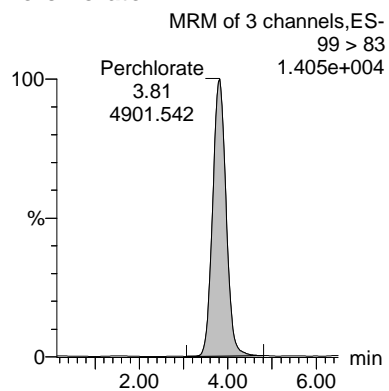
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

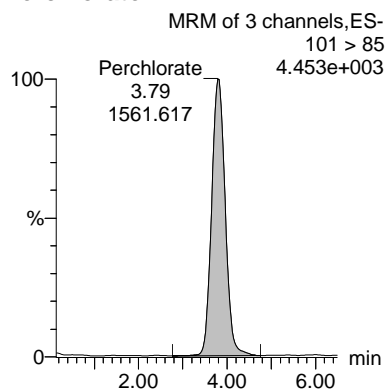
CWW
 03/31/2017

Name: per0330015a
Date: 30-Mar-2017
Time: 19:34:26
ID: 1203758666
Vial: 1:3,C

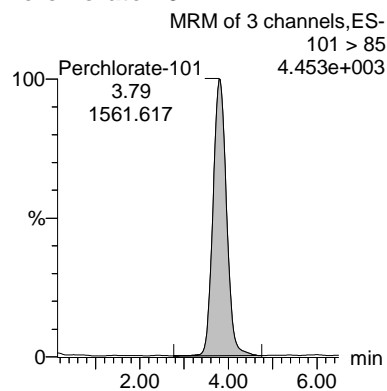
Perchlorate



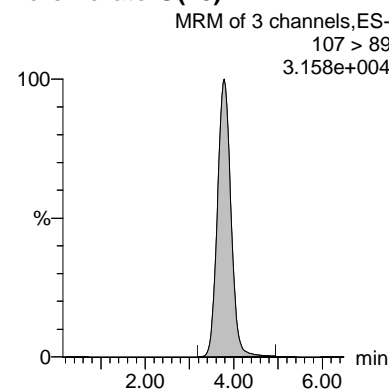
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758666	Perchlorate	99 > 83	3.81	4901.542	0.222	bb			0.2050	102.51	2.51	933.183	3.14
1203758666	Perchlorate-101	101 > 85	3.79	1561.617	0.071	bb			0.1980	98.99	-1.01	398.228	
1203758666	Perchlorate-O(18)	107 > 89	3.79	11043.403	11043.403	bb			0.3433	68.66	-31.34	2616.7...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRABMS

Date Received: 30-MAR-17

GEL Job No (SDG): 419533

GEL Sample ID: 1203758388

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	4.03	ug/L		4	30-MAR-17 21:28	per0330027a
	Perchlorate-O(18)			1.43	ug/L		4	30-MAR-17 21:28	per0330027a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

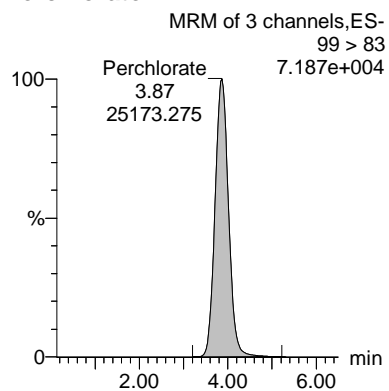
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

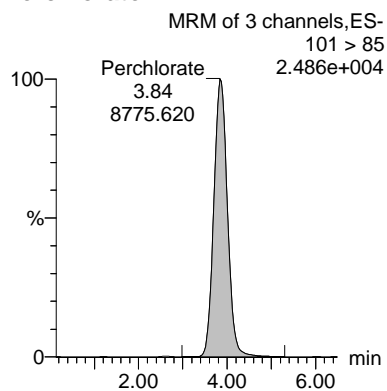
CWW
 03/31/2017

Name: per0330027a
Date: 30-Mar-2017
Time: 21:28:17
ID: 1203758388
Vial: 1:4,E

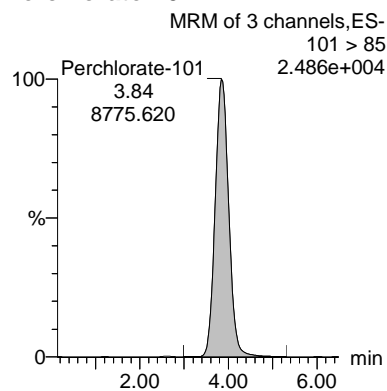
Perchlorate



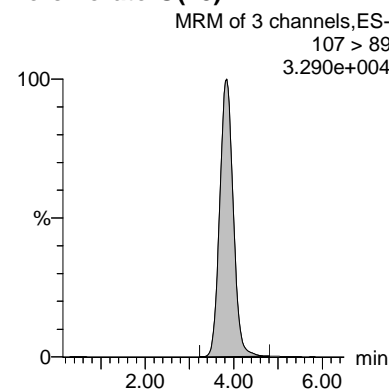
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758388	Perchlorate	99 > 83	3.87	25173.275	1.091	bb			1.0079	503.93	403.93	3264.3...	2.87
1203758388	Perchlorate-101	101 > 85	3.84	8775.620	0.380	bb			1.0649	532.47	432.47	2072.8...	
1203758388	Perchlorate-O(18)	107 > 89	3.84	11537.072	11537.072	bb			0.3587	71.73	-28.27	940.511	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRABMSD

Date Received: 30-MAR-17

GEL Job No (SDG): 419533

GEL Sample ID: 1203758390

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	3.78	ug/L		4	30-MAR-17 21:37	per0330028a
	Perchlorate-O(18)			1.28	ug/L		4	30-MAR-17 21:37	per0330028a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

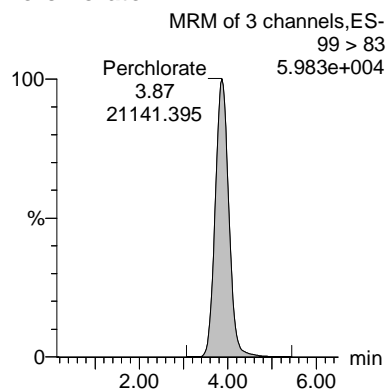
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

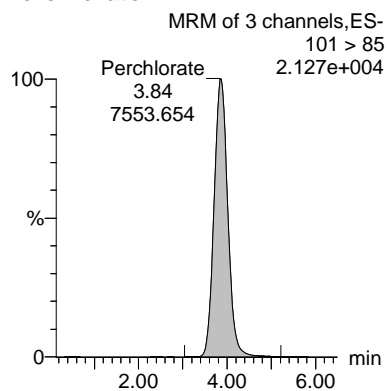
CWW
 03/31/2017

Name: per0330028a
Date: 30-Mar-2017
Time: 21:37:45
ID: 1203758390
Vial: 1:4,F

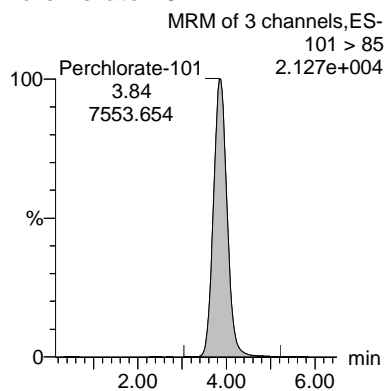
Perchlorate



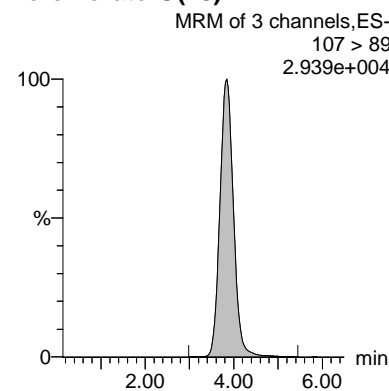
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758390	Perchlorate	99 > 83	3.87	21141.395	1.023	bb			0.9453	472.67	372.67	4792.7...	2.80
1203758390	Perchlorate-101	101 > 85	3.84	7553.654	0.366	bb			1.0238	511.88	411.88	1230.5...	
1203758390	Perchlorate-O(18)	107 > 89	3.84	10330.044	10330.044	bb			0.3211	64.23	-35.77	4589.8...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	30-MAR-17	per0330001a	IPB001
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330001a	IPB001
Perchlorate	0.00	0	NA	30-MAR-17	per0330002a	IPB001
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

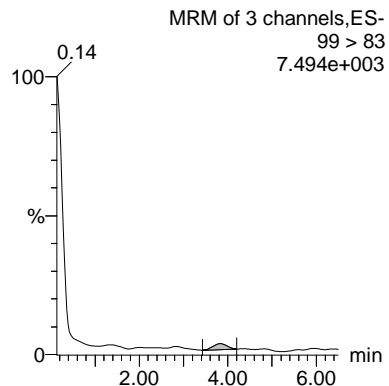
GL
 03/31/2017

CW
 03/31/2017

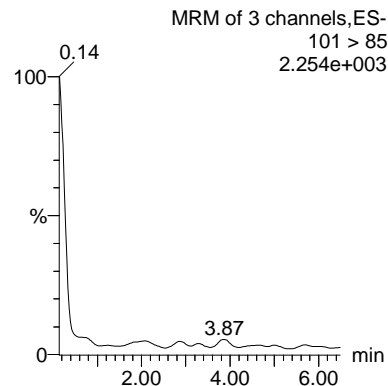
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per033017a.mdb 31 Mar 2017 09:14:12
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per033017a.cdb 31 Mar 2017 09:15:51

Name: per0330001a
 Date: 30-Mar-2017
 Time: 17:21:30
 ID: IPB001
 Vial: 1:1,A

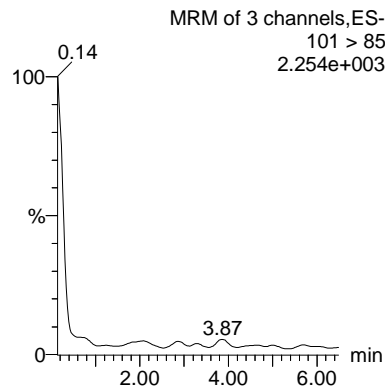
Perchlorate



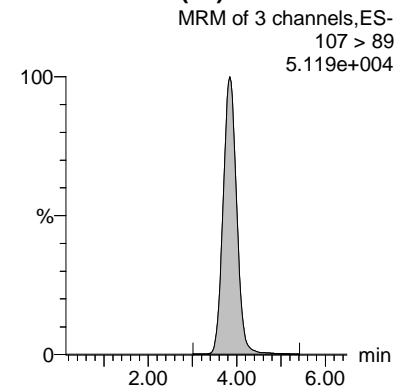
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.84	57.775	0.002	bb			0.0015			3.935 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	3.84	18070.672	18070.672	bb			0.5618	112.36	12.36	4495.4...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

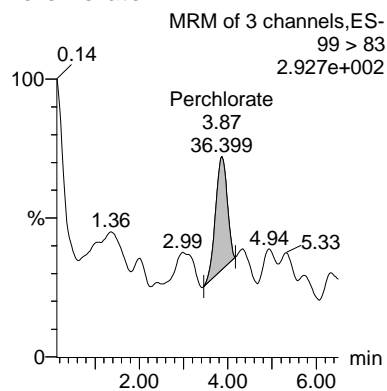
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

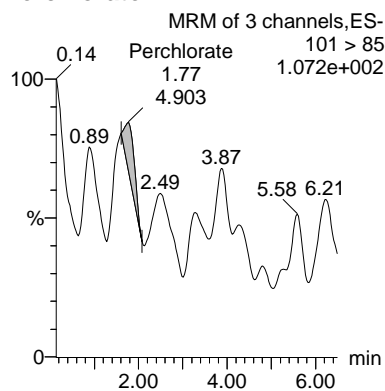
CWJ
 03/31/2017

Name: per0330002a
Date: 30-Mar-2017
Time: 17:31:02
ID: IPB001
Vial: 1:1,A

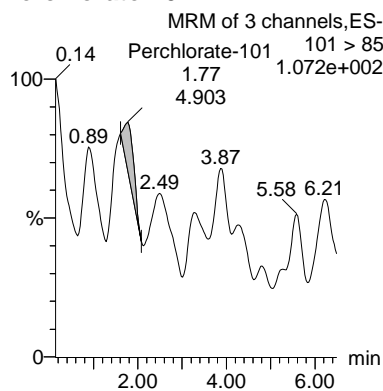
Perchlorate



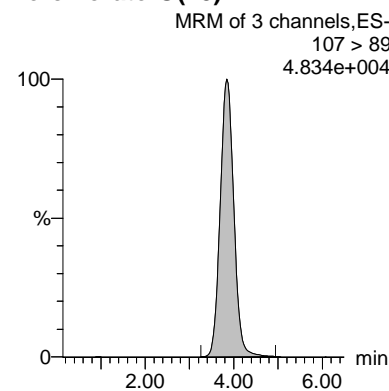
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB001	Perchlorate	99 > 83	3.87	36.399	0.001	bb			0.0010			6.438	7.42
IPB001	Perchlorate-101	101 > 85	1.77	4.903	0.000	bb			0.0004			3.198	
IPB001	Perchlorate-O(18)	107 > 89	3.84	17059.746	17059.746	bb			0.5303	106.07	6.07	2693.6...	

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419533Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	30-MAR-17	per0330009a	IPB002
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330009a	IPB002
Perchlorate	0.00	0	NA	30-MAR-17	per0330011a	IPB003
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330011a	IPB003
Perchlorate	0.00	0	NA	30-MAR-17	per0330018a	IPB004
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330018a	IPB004
Perchlorate	0.00	0	NA	30-MAR-17	per0330024a	IPB005
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330024a	IPB005
Perchlorate	0.00	0	NA	30-MAR-17	per0330030a	IPB006
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330030a	IPB006
Perchlorate	0.00	0	NA	30-MAR-17	per0330037a	IPB007
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330037a	IPB007

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

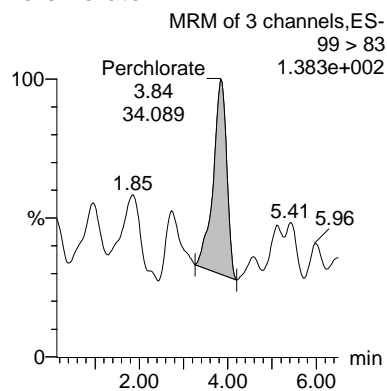
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

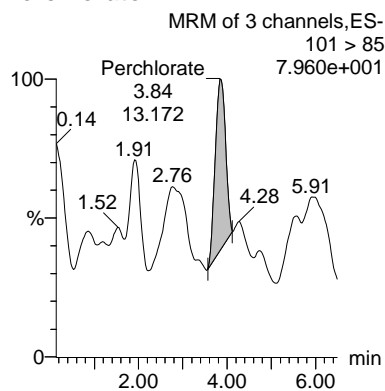
CW
 03/31/2017

Name: per0330009a
Date: 30-Mar-2017
Time: 18:37:27
ID: IPB002
Vial: 1:1,A

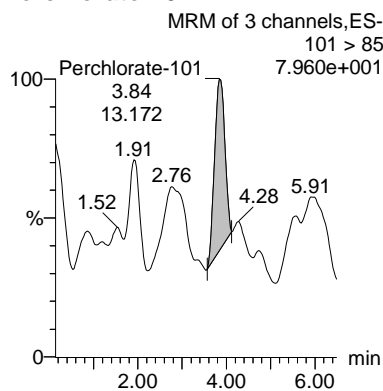
Perchlorate



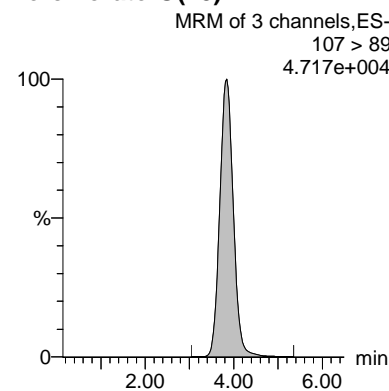
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB002	Perchlorate	99 > 83	3.84	34.089	0.001	bb			0.0009			4.254	2.59
IPB002	Perchlorate-101	101 > 85	3.84	13.172	0.000	bb			0.0011			4.980	
IPB002	Perchlorate-O(18)	107 > 89	3.84	16603.346	16603.346	bb			0.5162	103.23	3.23	1512.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

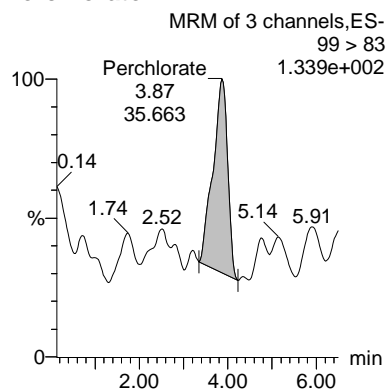
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

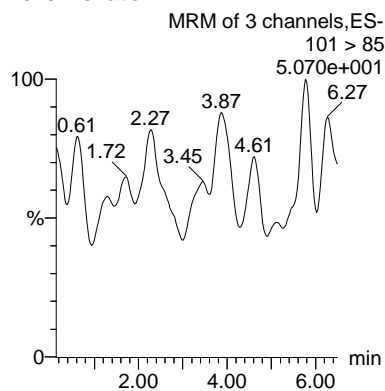
CW
 03/31/2017

Name: per0330011a
Date: 30-Mar-2017
Time: 18:56:25
ID: IPB003
Vial: 1:1,A

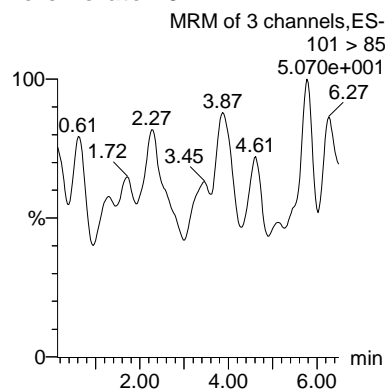
Perchlorate



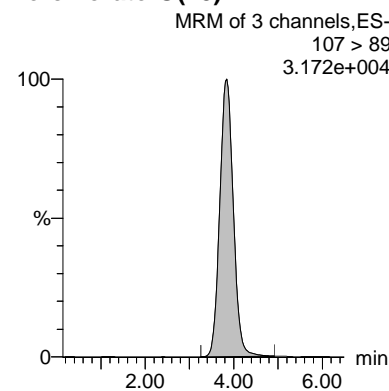
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	3.87	35.663	0.002	bb			0.0015			9.124 0.00
IPB003	Perchlorate-101	101 > 85										
IPB003	Perchlorate-O(18)	107 > 89	3.84	11149.793	11149.793	bb			0.3466	69.32	-30.68	1138.6...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

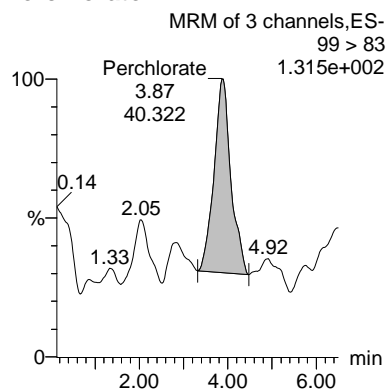
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

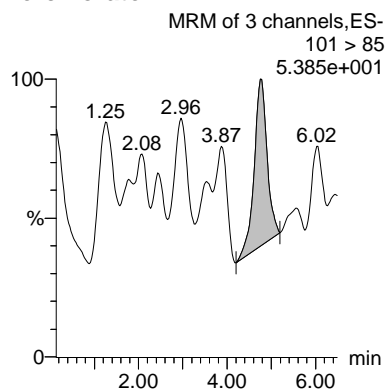
CW
 03/31/2017

Name: per0330018a
Date: 30-Mar-2017
Time: 20:02:53
ID: IPB004
Vial: 1:1,A

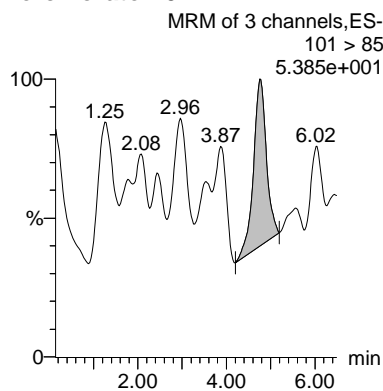
Perchlorate



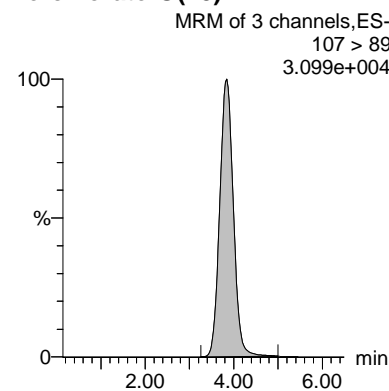
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB004	Perchlorate	99 > 83	3.87	40.322	0.002	bb			0.0017			4.510	3.72
IPB004	Perchlorate-101	101 > 85	4.75	10.837	0.000	bb			0.0014			3.389	
IPB004	Perchlorate-O(18)	107 > 89	3.84	10958.610	10958.610	bb			0.3407	68.14	-31.86	4966.6...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

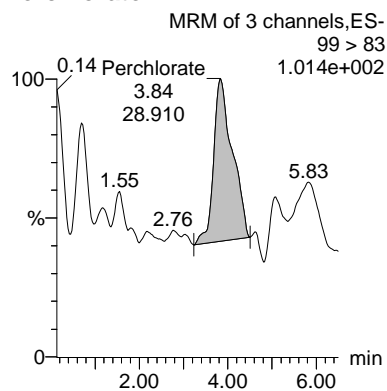
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

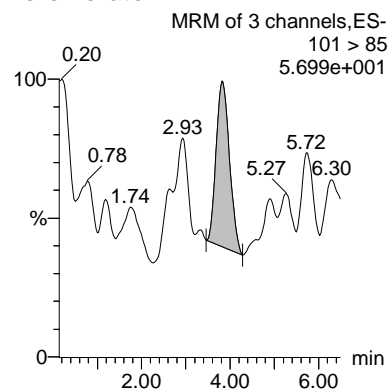
CW
 03/31/2017

Name: per0330024a
Date: 30-Mar-2017
Time: 20:59:51
ID: IPB005
Vial: 1:1,A

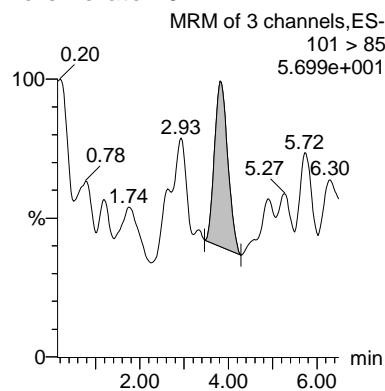
Perchlorate



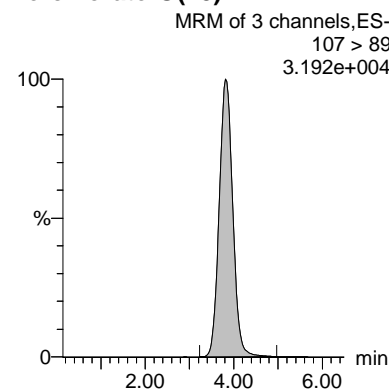
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB005	Perchlorate	99 > 83	3.84	28.910	0.001	bb			0.0012			4.003	2.45
IPB005	Perchlorate-101	101 > 85	3.81	11.780	0.001	bb			0.0015			2.815	
IPB005	Perchlorate-O(18)	107 > 89	3.81	11203.155	11203.155	bb			0.3483	69.66	-30.34	2650.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

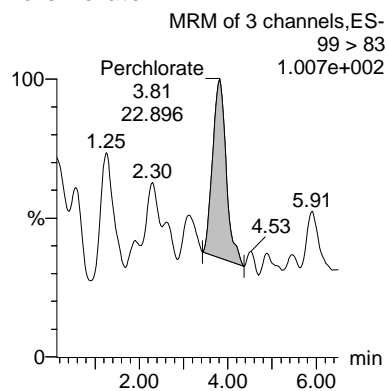
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

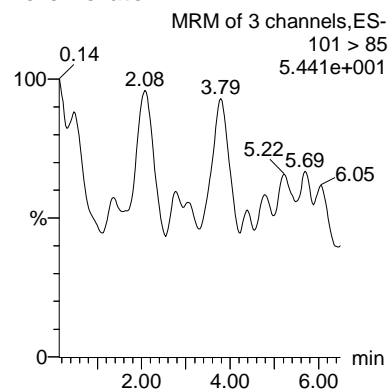
CWW
 03/31/2017

Name: per0330030a
Date: 30-Mar-2017
Time: 21:56:44
ID: IPB006
Vial: 1:1,A

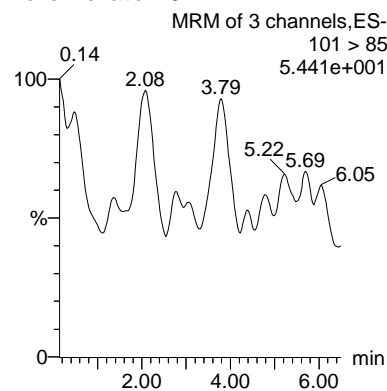
Perchlorate



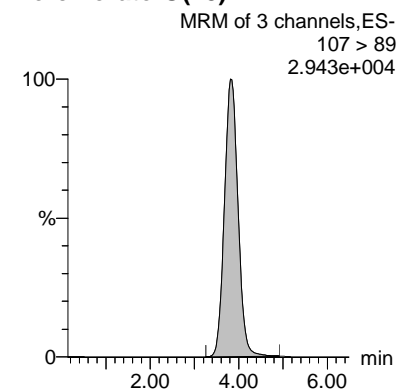
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB006	Perchlorate	99 > 83	3.81	22.896	0.001	bb			0.0010			2.958 0.00
IPB006	Perchlorate-101	101 > 85										
IPB006	Perchlorate-O(18)	107 > 89	3.81	10384.417	10384.417	bb			0.3228	64.57	-35.43	4431.8...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

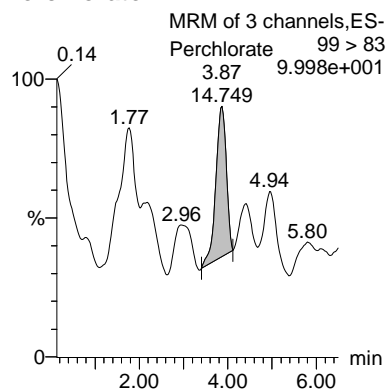
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

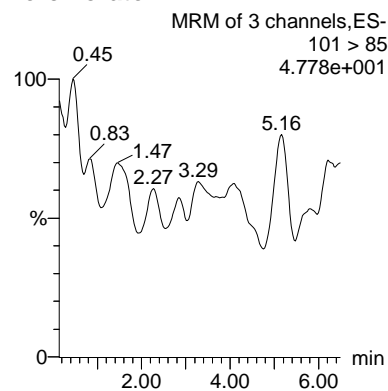
CWW
 03/31/2017

Name: per0330037a
Date: 30-Mar-2017
Time: 23:03:07
ID: IPB007
Vial: 1:1,A

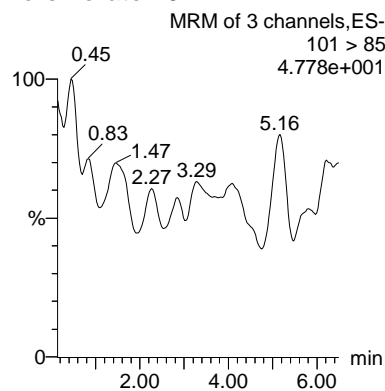
Perchlorate



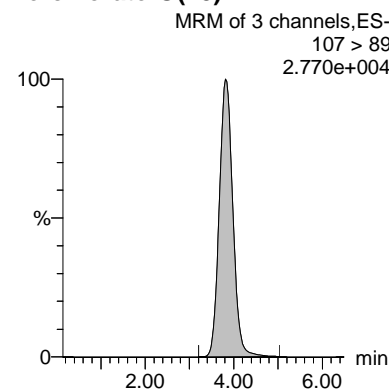
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB007	Perchlorate	99 > 83	3.87	14.749	0.001	bb			0.0007			8.637 0.00
IPB007	Perchlorate-101	101 > 85										
IPB007	Perchlorate-O(18)	107 > 89	3.81	9721.696	9721.696	bb			0.3022	60.45	-39.55	2595.4...

Miscellaneous

Prep Logbook

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1652084 Verified by: _____
 Analyst: Grace Cappelmann
 Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
 Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203758384 MB	30-MAR-2017 14:30:00	10	10	1
1203758386 LCS	30-MAR-2017 14:30:00	10	10	1
1203758666 ICS	30-MAR-2017 14:30:00	10	10	1
418779005	30-MAR-2017 14:30:00	10	10	1
418779006	30-MAR-2017 14:30:00	10	10	1
1203758387 MS (418779006)	30-MAR-2017 14:30:00	10	10	1
1203758389 MSD (418779006)	30-MAR-2017 14:30:00	10	10	1
418779011	30-MAR-2017 14:30:00	10	10	1
419533001	30-MAR-2017 14:30:00	10	10	1
1203758388 MS (419533001)	30-MAR-2017 14:30:00	10	10	1
1203758390 MSD (419533001)	30-MAR-2017 14:30:00	10	10	1
419536001	30-MAR-2017 14:30:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203758666	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161107-2.5-Ba/Ag/H
LCS	1203758386	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203758387	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203758388	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203758389	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203758390	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

Cww

03/31/2017

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/30/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per033017a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/30/17

Standard-Samp Reagent Lot#.: 2457559

Alt Check Std. ID: WCL170320-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0330001a	IPB01	GXC1	3/30/2017 17:21			1		USE	B
per0330002a	IPB01	GXC1	3/30/2017 17:31			1		USE	B
per0330003a	WCLICAL-01	GXC1	3/30/2017 17:40			1		USE	I
per0330004a	WCLICAL-02	GXC1	3/30/2017 17:50			1		USE	I
per0330005a	WCLICAL-03	GXC1	3/30/2017 17:59			1		USE	I
per0330006a	WCLICAL-04	GXC1	3/30/2017 18:09			1		USE	I
per0330007a	WCLICAL-05	GXC1	3/30/2017 18:18			1		USE	I
per0330008a	WCLICAL-06	GXC1	3/30/2017 18:27			1		USE	I
per0330009a	IPB02	GXC1	3/30/2017 18:37			1		USE	B
per0330010a	WCLICV	GXC1	3/30/2017 18:46			1		USE	C
per0330011a	IPB03	GXC1	3/30/2017 18:56			1		USE	B
per0330012a	WCLCRI	GXC1	3/30/2017 19:05			1		USE	C
per0330013a	1203758384	GXC1	3/30/2017 19:15	1652086	Various	1	Various	USE	S
per0330014a	1203758386	GXC1	3/30/2017 19:24	1652086	Various	1	Various	USE	S
per0330015a	1203758666	GXC1	3/30/2017 19:34	1652086	Various	1	Various	USE	S
per0330016a	418779005	GXC1	3/30/2017 19:43	1652086	418779	2	AMIP	DUSE	S
per0330017a	418779005	GXC1	3/30/2017 19:53	1652086	418779	1	AMIP	USE	S
per0330018a	IPB04	GXC1	3/30/2017 20:02			1		USE	B
per0330019a	418779006	GXC1	3/30/2017 20:12	1652086	418779	1	AMIP	USE	S
per0330020a	1203758387	GXC1	3/30/2017 20:21	1652086	418779	1	AMIP	USE	S
per0330021a	1203758389	GXC1	3/30/2017 20:31	1652086	418779	1	AMIP	USE	S
per0330022a	418779011	GXC1	3/30/2017 20:40	1652086	418779	1	AMIP	USE	S
per0330023a	WCLCCV	GXC1	3/30/2017 20:50			1		USE	C
per0330024a	IPB05	GXC1	3/30/2017 20:59			1		USE	B
per0330025a	WCLCRI	GXC1	3/30/2017 21:09			1		USE	C
per0330026a	419533001	GXC1	3/30/2017 21:18	1652086	419533	4	MBAC	USE	S
per0330027a	1203758388	GXC1	3/30/2017 21:28	1652086	419533	4	MBAC	USE	S
per0330028a	1203758390	GXC1	3/30/2017 21:37	1652086	419533	4	MBAC	USE	S
per0330029a	419536001	GXC1	3/30/2017 21:47	1652086	419536	10000	MBAC	USE	S

per0330030a	IPB006	GXC1	3/30/2017 21:56			1		USE	B
per0330031a	1203758231	GXC1	3/30/2017 22:06	1652028	Various	1	ARSL	USE	S
per0330032a	1203758232	GXC1	3/30/2017 22:15	1652028	Various	1	ARSL	USE	S
per0330033a	1203758235	GXC1	3/30/2017 22:25	1652028	Various	1	ARSL	USE	S
per0330034a	418920001	GXC1	3/30/2017 22:34	1652028	2017-1230	1	ARSL	USE	S
per0330035a	418933001	GXC1	3/30/2017 22:44	1652028	2017-1226	1	ARSL	USE	S
per0330036a	WCLCCV	GXC1	3/30/2017 22:53			1		USE	C
per0330037a	IPB007	GXC1	3/30/2017 23:03			1		USE	B
per0330038a	WCLCRI	GXC1	3/30/2017 23:12			1		USE	C
per0330039a	1203758233	GXC1	3/30/2017 23:22	1652028	2017-1226	1	ARSL	USE	S
per0330040a	1203758234	GXC1	3/30/2017 23:31	1652028	2017-1226	1	ARSL	USE	S
per0330041a	418933005	GXC1	3/30/2017 23:41	1652028	2017-1226	1	ARSL	USE	S
per0330042a	418933007	GXC1	3/30/2017 23:50	1652028	2017-1226	1	ARSL	USE	S
per0330043a	418933011	GXC1	3/31/2017 0:00	1652028	2017-1226	1	ARSL	USE	S
per0330044a	419384001	GXC1	3/31/2017 0:09	1652028	2017-1264	1	ARSL	USE	S
per0330045a	WCLCCV	GXC1	3/31/2017 0:18			1		USE	C
per0330046a	IPB008	GXC1	3/31/2017 0:28			1		USE	B
per0330047a	WCLCRI	GXC1	3/31/2017 0:37			1		USE	C
per0330048a	O-18 Screen UCL1	GXC1	3/31/2017 0:47	Screen		1	GEL	USE	S
per0330049a	ICAL STD Screen L	GXC1	3/31/2017 0:56	Screen		1	GEL	USE	S

DATA EXCEPTION REPORT			
Mo.Day Yr. 31-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1652086	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 419533,419536			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. In 1203758390 (MSD) a 0% recovery was observed, which is out of the acceptance range of 75-125%. The detected concentration in the MSD was lower than that detected in the parent sample.		1. The outlier observed for the MSD was due to the background concentration in the parent sample, 419533001 (LH18/24-SP650-6) and the need of a 1:4 dilution prior to analysis. Will report data and note in case narrative.	
Originator's Name: Grace Cappelmann 31-MAR-17		Data Validator/Group Leader: Charles Wilson 31-MAR-17	

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.



March 30, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 419536

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 30, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Linda Pullano for
Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Perchlorates by LCMSMS Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	15
Quality Control Summary.....	17
Sample Data.....	22
Standards.....	25
Quality Control Data.....	45
Miscellaneous.....	66

Case Narrative

Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 419536

March 30, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 30, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

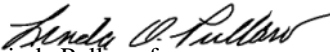
Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
419536001	LH18/24-SP140-7428-GRAB

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.


Linda Pullano for
Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

419536

CHAIN OF CUSTODY

Name Of Lab Shipping To: GEL Laboratories (843) 556 - 8171 ATTN: HOPE TAYLOR Page 1 of 1

Project: AECOM LONGHORN ARMY AMMIN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. 60256135.GWTPT HRUMAR16							
			Job: GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES			Prepared By: Scott Beesinger				
Field Sample I.D. LH18/24-SP140-7428-GRAB			Sample Matrix Water		Date / Time 03/29/17 / 15:00					
			MS / MSD 1			NO. OF CONTAINERS 1				
PERCHLORATE			Analyses							
Remarks (Preservatives, etc.) NONE			Lab I.D.#							

24 HR. TURN AROUND TIME

Additional Remarks:		Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By: <i>Scott Beesinger</i>		03/29/17	15:45	Received By: <i>Abby Bean</i>	3/30/17	0930	Relinquished By:			Received By:		
Received At Lab By:		Date	Time	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition			
Remarks:												

SAMPLE RECEIPT & REVIEW FORM

Client: <u>MBAC</u>	SDG/AR/COC/Work Order: <u>419536</u>
Received By: <u>AG</u>	Date Received: <u>03/30/17</u>
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground <u>UPS</u> Field Services Courier Other
	<u>J461 688 223 8</u>
Suspected Hazard Information	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hazard Class Shipped: _____ UN#: _____
COC/Samples marked as radioactive?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>1</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR2-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AG Date 3/30/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 30 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
 Technical Case Narrative
 Microbac Laboratories, Inc Kentucky Division (MBAC)
 SDG #: 419536**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1652086

Prep Batch Number: 1652084

Sample Analysis

Sample ID	Client ID
419536001	419536001 (LH18/24-SP140-7428-GRAB)
1203758666	Interference Check Sample (ICS)
1203758384	Method Blank (MB)
1203758386	Laboratory Control Sample (LCS)
1203758388	419533001(LH18/24-SP650-6428-GRAB) Matrix Spike (MS)
1203758390	419533001(LH18/24-SP650-6428-GRAB) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 419533001 (LH18/24-SP650-6428-GRAB) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In 1203758390 (MSD) a 0% recovery was observed, which is out of the acceptance range of 75-125%. The detected concentration in the MSD was lower than that detected in the parent sample. The outlier observed for the MSD was due to the background concentration in the parent sample, 419533001 (LH18/24-SP650-6428-GRAB) and the need of a 1:4 dilution prior to analysis. 1203758390 (LH18/24-SP650-6428-GRABMSD).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based

on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203758388 (LH18/24-SP650-6428-GRABMS), 1203758390 (LH18/24-SP650-6428-GRABMSD) and 419536001 (LH18/24-SP140-7428-GRAB) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1619472 was generated for sample 1203758390 (LH18/24-SP650-6428-GRABMSD) in this SDG/batch.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 419536 GEL Work Order: 419536

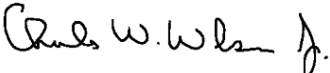
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 31 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP140-7428-GRAB

Date Received: 30-MAR-17

GEL Job No (SDG): 419536

GEL Sample ID: 419536001

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	500	2000	9540	ug/L		10000	30-MAR-17 21:47	per0330029a
	Perchlorate-O(18)			2850	ug/L		10000	30-MAR-17 21:47	per0330029a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 419536

Extract Batch Code: 1652084

Date Filtered: 30-MAR-17

Matrix: WATER

Sample ID: 1203758386

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate-O(18)		.335	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 419536Extract Batch Code: 1652084Date Filtered: 30-MAR-17Matrix: WATERSample ID: 1203758666

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.205	ug/L	103		70 - 130
Perchlorate-O(18)		.343	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 419536Extract Batch Code: 1652084Date Extracted: 30-MAR-17GEL MS/PS ID: 1203758388Client ID: LH18/24-SP650-6428-GRABGEL MSD/PSD ID: 1203758390QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	3.86	ug/L	4.03	87	3.78	0 *	6	30	75 - 125
Perchlorate-O(18)	0	1.60	ug/L	1.43		1.28		11		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0330006a	30-MAR-17	16903.4				
Lower Area Limit			8451.7				
Upper Area Limit			25355.1				
1203758384	per0330013a	30-MAR-17 19:15	16143.3	3.84	3.89552	1.014	
1203758386	per0330014a	30-MAR-17 19:24	10789.5	3.84	3.868	1.007	
1203758666	per0330015a	30-MAR-17 19:34	11043.4	3.79	3.81283	1.006	
1203758388	per0330027a	30-MAR-17 21:28	11537.1	3.84	3.868	1.007	
1203758390	per0330028a	30-MAR-17 21:37	10330	3.84	3.868	1.007	
419536001	per0330029a	30-MAR-17 21:47	9164.24	3.81	3.84035	1.008	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP140-7428-GRAB

Date Received: 30-MAR-17

GEL Job No (SDG): 419536

GEL Sample ID: 419536001

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	500	2000	9540	ug/L		10000	30-MAR-17 21:47	per0330029a
	Perchlorate-O(18)			2850	ug/L		10000	30-MAR-17 21:47	per0330029a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

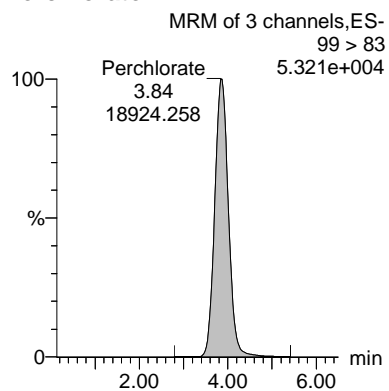
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

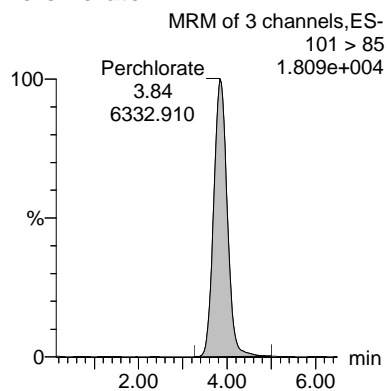
CW
 03/31/2017

Name: per0330029a
Date: 30-Mar-2017
Time: 21:47:13
ID: 419536001
Vial: 1:5,A

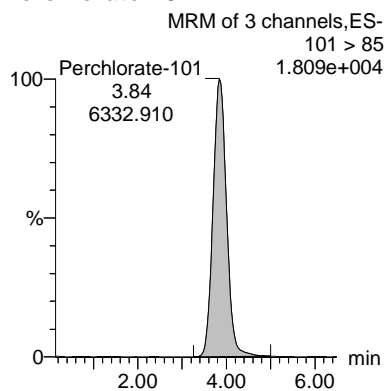
Perchlorate



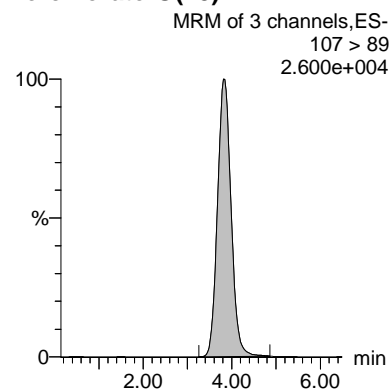
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
419536001	Perchlorate	99 > 83	3.84	18924.258	1.033	bb			0.9539			7160.5... 2.99
419536001	Perchlorate-101	101 > 85	3.84	6332.910	0.346	bb			0.9675			2535.3...
419536001	Perchlorate-O(18)	107 > 89	3.81	9164.240	9164.240	bb			0.2849	56.98	-43.02	3910.5...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419536

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 30-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate

Coefficient of Determination: .

Calibration Curve: 1.08167

Response Type: Internal Standard

Curve Type: RF

Perchlorate Initial Calibration

Lab Name: General Engineering Laboratories

GEL Job No.(SDG): 419536

Lab Code: GEL

Instrument ID: LCMSMS2

Date Analyzed: 30-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname Perchlorate-101

Coefficient of Determination: .

Calibration Curve: .35667

Response Type: Internal Standard

Curve Type: RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 1 of 2

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

GL
03/31/2017CW
03/31/2017

Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time

Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per033017a.mdb 31 Mar 2017 09:14:12

Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per033017a.cdb 31 Mar 2017 09:15:51

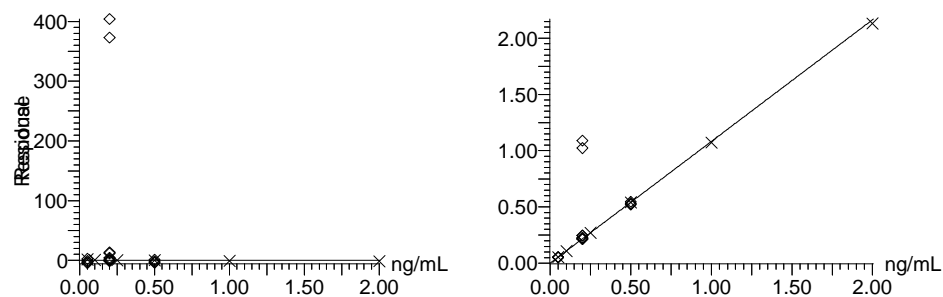
Compound name: Perchlorate

Response Factor: 1.08246

RRF SD: 0.0119871, % Relative SD: 1.10739

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



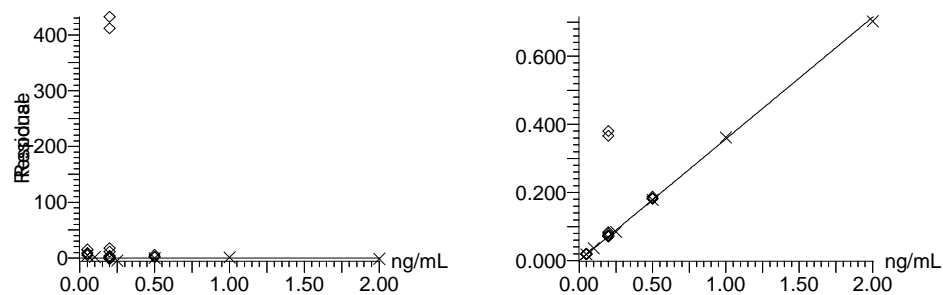
Compound name: Perchlorate-101

Response Factor: 0.357128

RRF SD: 0.0113044, % Relative SD: 3.16535

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



Quantify Calibration Report MassLynx 4.0 SP4

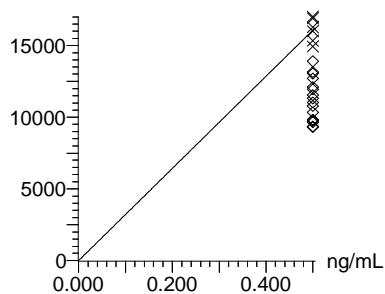
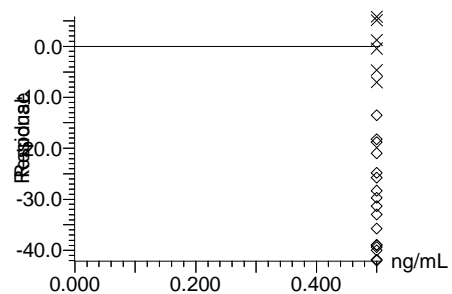
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time

Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

Compound name: Perchlorate-O(18)
Response Factor: 32167
RRF SD: 1659.85, % Relative SD: 5.16011
Response type: External Std, Area
Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

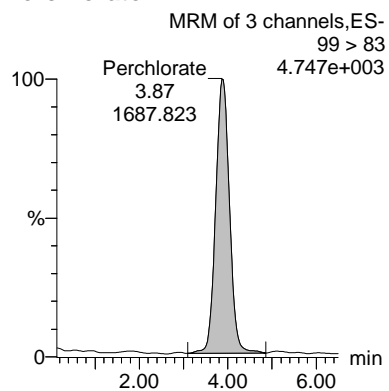
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

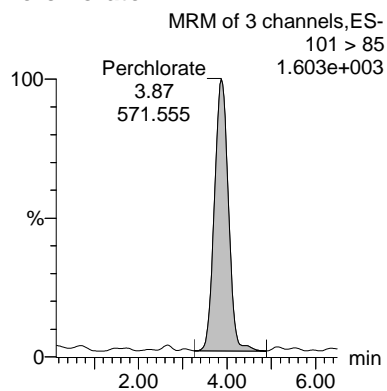
CWW
 03/31/2017

Name: per0330003a
Date: 30-Mar-2017
Time: 17:40:34
ID: WCL170320-01
Vial: 1:1,B

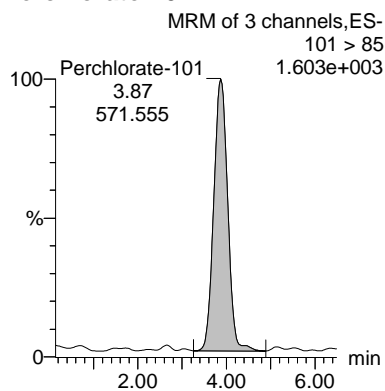
Perchlorate



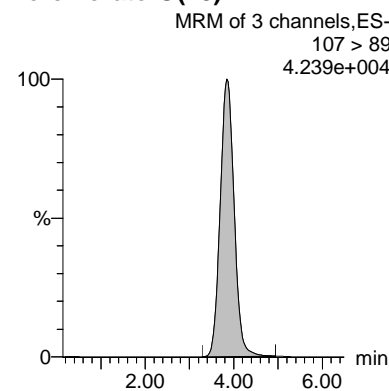
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-01	Perchlorate	99 > 83	3.87	1687.823	0.055	bb			0.0508	101.68	1.68	362.740	2.95
WCL170320-01	Perchlorate-101	101 > 85	3.87	571.555	0.019	bb			0.0522	104.37	4.37	129.625	
WCL170320-01	Perchlorate-O(18)	107 > 89	3.84	15334.690	15334.690	bb			0.4767	95.34	-4.66	5010.0...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

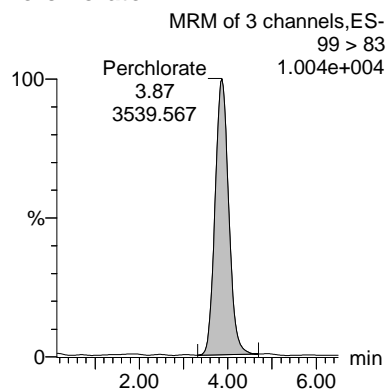
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

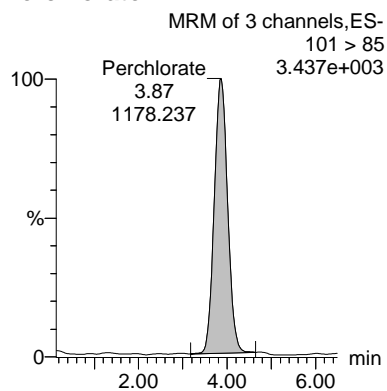
CWW
 03/31/2017

Name: per0330004a
Date: 30-Mar-2017
Time: 17:50:03
ID: WCL170320-02
Vial: 1:1,C

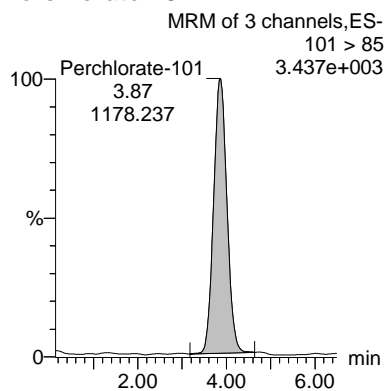
Perchlorate



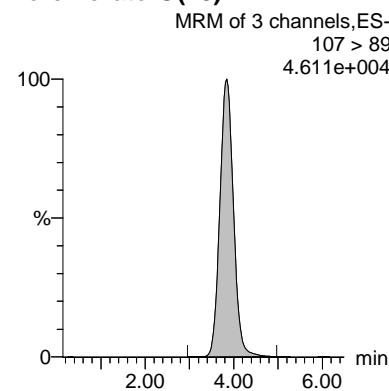
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-02	Perchlorate	99 > 83	3.87	3539.567	0.109	bb			0.1004	100.41	0.41	504.214	3.00
WCL170320-02	Perchlorate-101	101 > 85	3.87	1178.237	0.036	bb			0.1013	101.31	1.31	367.927	
WCL170320-02	Perchlorate-O(18)	107 > 89	3.84	16282.772	16282.772	bb			0.5062	101.24	1.24	3191.1...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

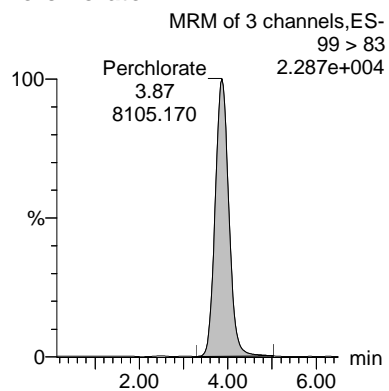
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

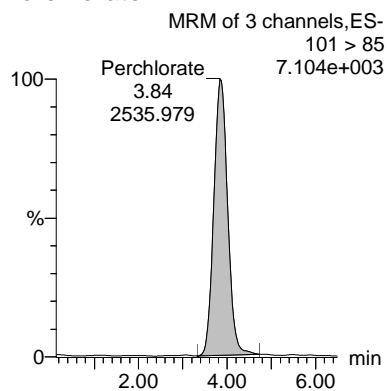
CWW
 03/31/2017

Name: per0330005a
Date: 30-Mar-2017
Time: 17:59:32
ID: WCL170320-03
Vial: 1:1,D

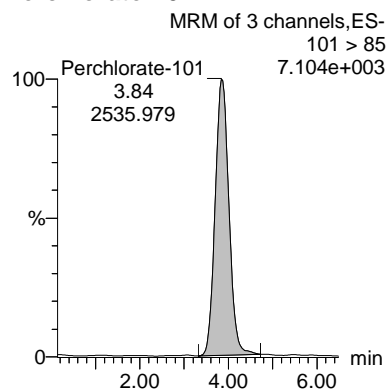
Perchlorate



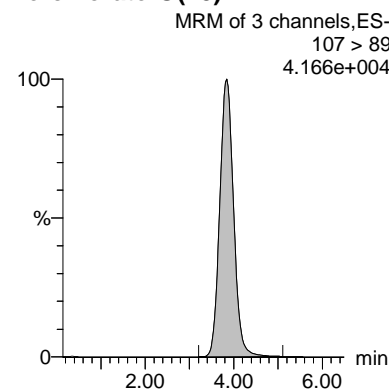
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-03	Perchlorate	99 > 83	3.87	8105.170	0.271	bb			0.2504	100.18	0.18	1617.0...	3.20
WCL170320-03	Perchlorate-101	101 > 85	3.84	2535.979	0.085	bb			0.2375	95.00	-5.00	876.314	
WCL170320-03	Perchlorate-O(18)	107 > 89	3.84	14949.227	14949.227	bb			0.4647	92.95	-7.05	6953.4...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

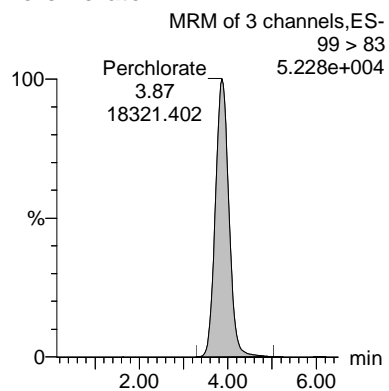
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

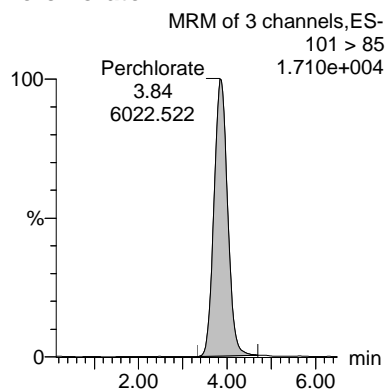
CWW
 03/31/2017

Name: per0330006a
Date: 30-Mar-2017
Time: 18:09:02
ID: WCL170320-04
Vial: 1:1,E

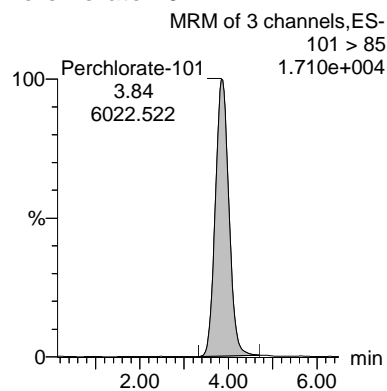
Perchlorate



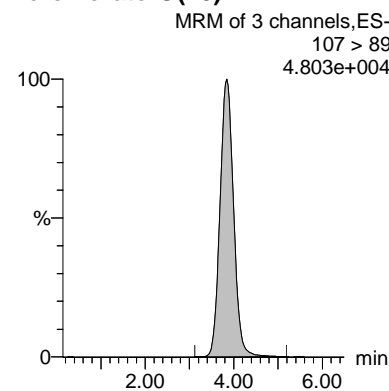
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
WCL170320-04	Perchlorate	99 > 83	3.87	18321.402	0.542	bb			0.5007	100.13	0.13	4402.0...
WCL170320-04	Perchlorate-101	101 > 85	3.84	6022.522	0.178	bb			0.4988	99.77	-0.23	4014.3...
WCL170320-04	Perchlorate-O(18)	107 > 89	3.84	16903.424	16903.424	bb			0.5255	105.10	5.10	3450.4...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

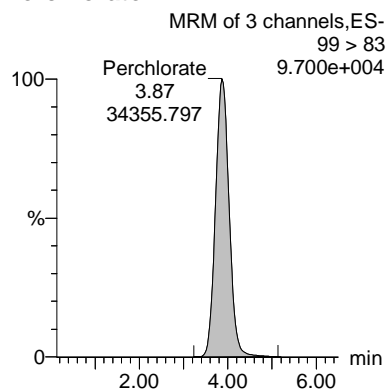
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

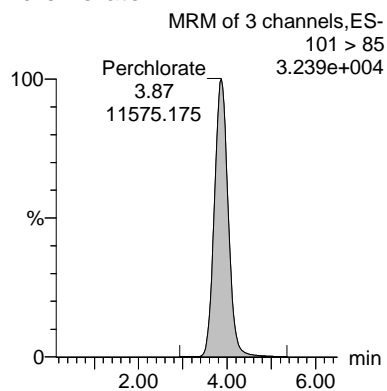
CWW
 03/31/2017

Name: per0330007a
Date: 30-Mar-2017
Time: 18:18:30
ID: WCL170320-05
Vial: 1:1,F

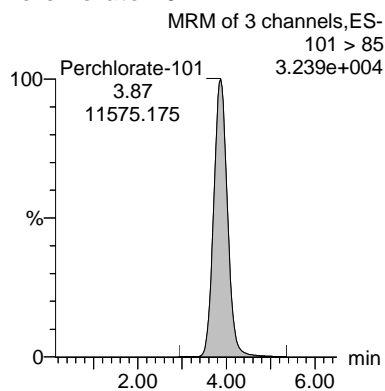
Perchlorate



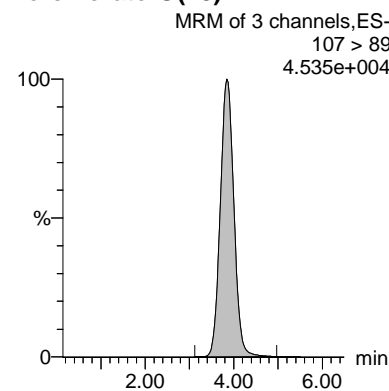
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-05	Perchlorate	99 > 83	3.87	34355.797	1.073	bb			0.9912	99.12	-0.88	6395.5...	2.97
WCL170320-05	Perchlorate-101	101 > 85	3.87	11575.175	0.362	bb			1.0123	101.23	1.23	1935.8...	
WCL170320-05	Perchlorate-O(18)	107 > 89	3.84	16009.761	16009.761	bb			0.4977	99.54	-0.46	4708.9...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

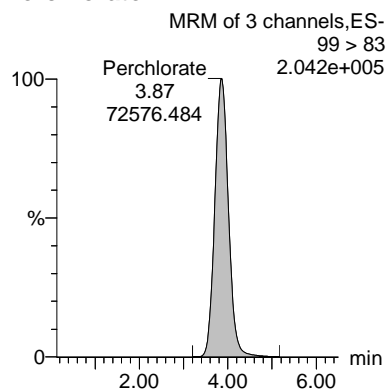
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

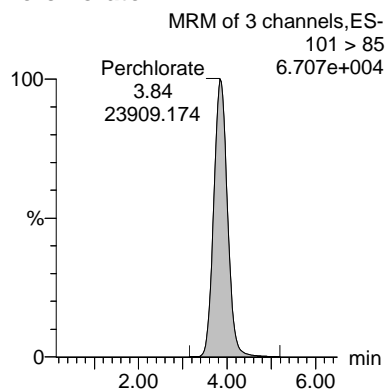
CWW
 03/31/2017

Name: per0330008a
Date: 30-Mar-2017
Time: 18:27:56
ID: WCL170320-06
Vial: 1:2,A

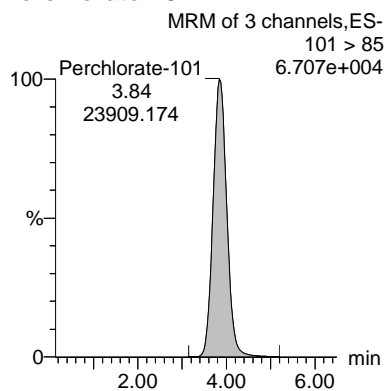
Perchlorate



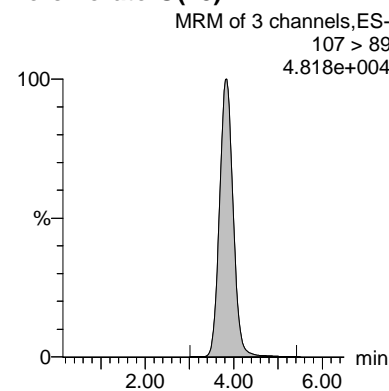
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-06	Perchlorate	99 > 83	3.87	72576.484	2.132	bb			1.9695	98.48	-1.52	10445....	3.04
WCL170320-06	Perchlorate-101	101 > 85	3.84	23909.174	0.702	bb			1.9666	98.33	-1.67	5705.7...	
WCL170320-06	Perchlorate-O(18)	107 > 89	3.84	17021.146	17021.146	bb			0.5291	105.83	5.83	4521.2...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.49	97.08	30-MAR-17 18:46	per0330010a
Perchlorate Isotope Ratio		2.87		30-MAR-17 18:46	per0330010a
Perchlorate-101	.5	.51	102.36	30-MAR-17 18:46	per0330010a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

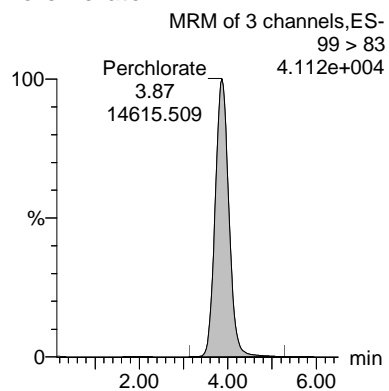
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

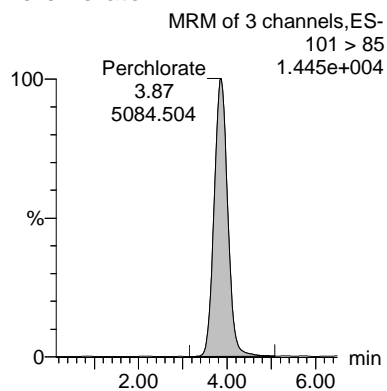
CWW
 03/31/2017

Name: per0330010a
Date: 30-Mar-2017
Time: 18:46:56
ID: WCL170320-07ICV
Vial: 1:2,B

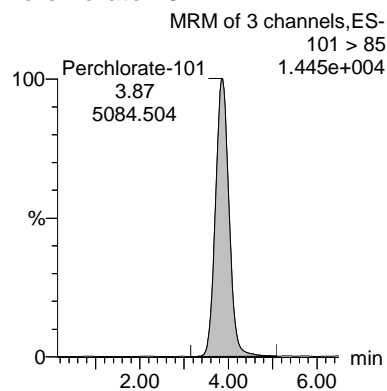
Perchlorate



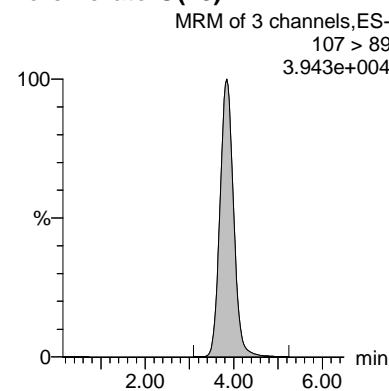
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07ICV	Perchlorate	99 > 83	3.87	14615.509	0.525	bb			0.4854	97.08	-2.92	1140.6...	2.87
WCL170320-07ICV	Perchlorate-101	101 > 85	3.87	5084.504	0.183	bb			0.5118	102.36	2.36	2169.7...	
WCL170320-07ICV	Perchlorate-O(18)	107 > 89	3.84	13908.722	13908.722	bb			0.4324	86.48	-13.52	4252.3...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.48	95.97	30-MAR-17 20:50	per0330023a
Perchlorate Isotope Ratio		2.85		30-MAR-17 20:50	per0330023a
Perchlorate-101	.5	.51	102.04	30-MAR-17 20:50	per0330023a
Perchlorate	.5	.49	98.4	30-MAR-17 22:53	per0330036a
Perchlorate Isotope Ratio		2.93		30-MAR-17 22:53	per0330036a
Perchlorate-101	.5	.51	101.73	30-MAR-17 22:53	per0330036a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

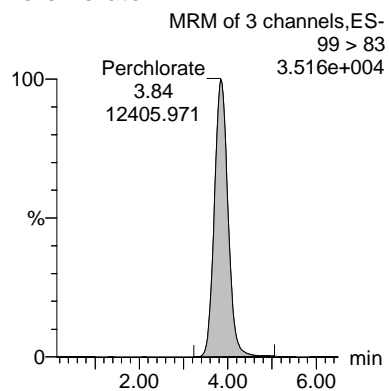
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

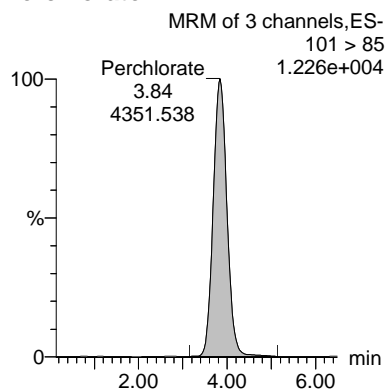
CWW
 03/31/2017

Name: per0330023a
Date: 30-Mar-2017
Time: 20:50:21
ID: WCL170320-07CCV
Vial: 1:2,B

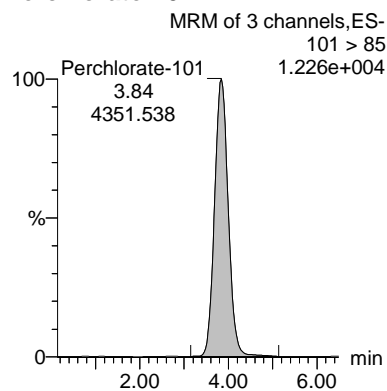
Perchlorate



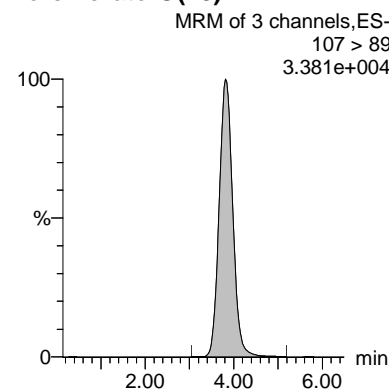
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	3.84	12405.971	0.519	bb			0.4799	95.97	-4.03	595.179	2.85
WCL170320-07CCV	Perchlorate-101	101 > 85	3.84	4351.538	0.182	bb			0.5102	102.04	2.04	2084.4...	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	3.81	11941.714	11941.714	bb			0.3712	74.25	-25.75	6627.1...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

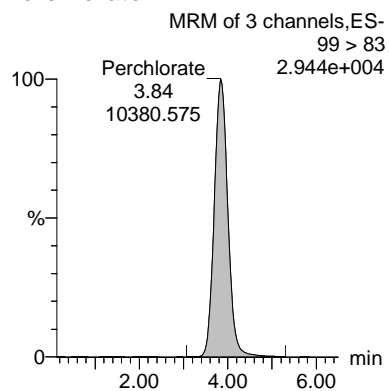
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

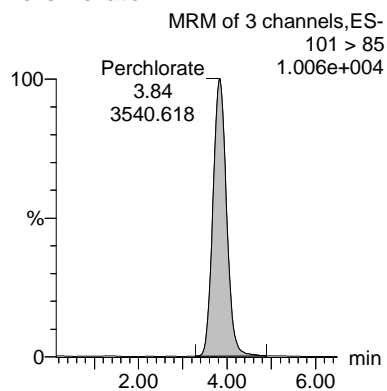
CWW
 03/31/2017

Name: per0330036a
Date: 30-Mar-2017
Time: 22:53:39
ID: WCL170320-07CCV
Vial: 1:2,B

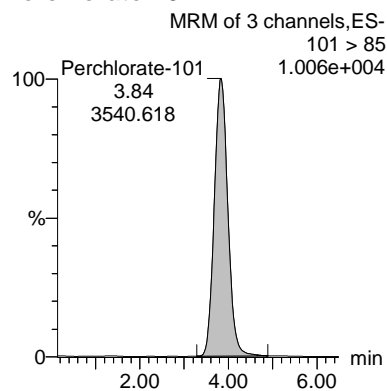
Perchlorate



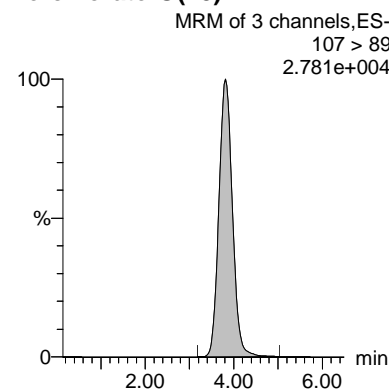
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-07CCV	Perchlorate	99 > 83	3.84	10380.575	0.533	bb			0.4920	98.40	-1.60	2603.2...	2.93
WCL170320-07CCV	Perchlorate-101	101 > 85	3.84	3540.618	0.182	bb			0.5087	101.73	1.73	1935.8...	
WCL170320-07CCV	Perchlorate-O(18)	107 > 89	3.81	9745.502	9745.502	bb			0.3030	60.59	-39.41	2322.1...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	95.45	30-MAR-17 19:05	per0330012a
Perchlorate Isotope Ratio		2.66		30-MAR-17 19:05	per0330012a
Perchlorate-101	.05	.05	108.78	30-MAR-17 19:05	per0330012a
Perchlorate	.05	.05	102.42	30-MAR-17 21:09	per0330025a
Perchlorate Isotope Ratio		2.96		30-MAR-17 21:09	per0330025a
Perchlorate-101	.05	.05	104.74	30-MAR-17 21:09	per0330025a
Perchlorate	.05	.05	98.83	30-MAR-17 23:12	per0330038a
Perchlorate Isotope Ratio		2.8		30-MAR-17 23:12	per0330038a
Perchlorate-101	.05	.05	106.99	30-MAR-17 23:12	per0330038a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

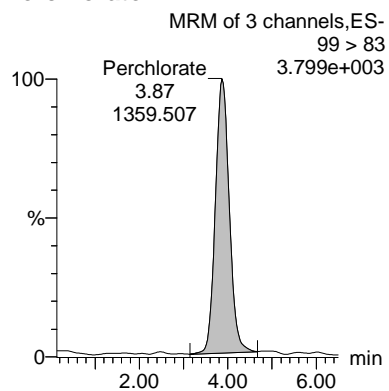
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

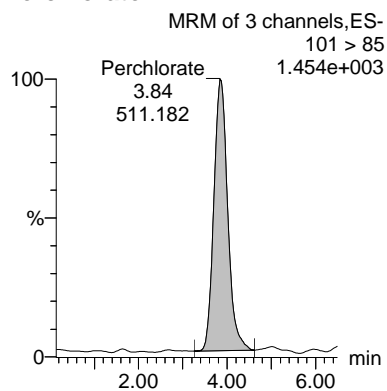
CWW
 03/31/2017

Name: per0330012a
Date: 30-Mar-2017
Time: 19:05:55
ID: WCL170320-08CRI
Vial: 1:2,C

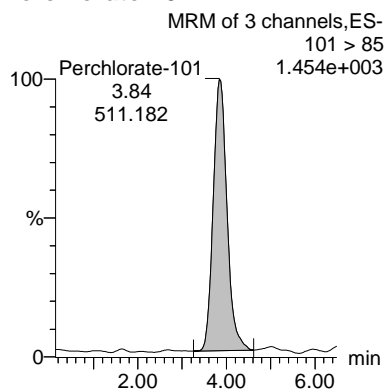
Perchlorate



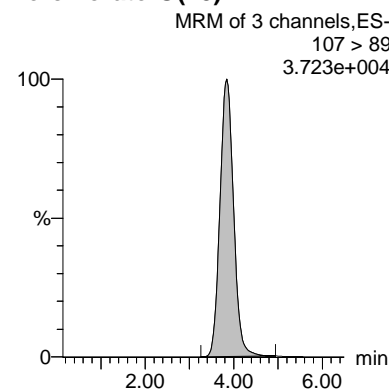
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.87	1359.507	0.052	bb			0.0477	95.45	-4.55	306.198	2.66
WCL170320-08CRI	Perchlorate-101	101 > 85	3.84	511.182	0.019	bb			0.0544	108.78	8.78	135.066	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.84	13157.903	13157.903	bb			0.4090	81.81	-18.19	1004.8...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

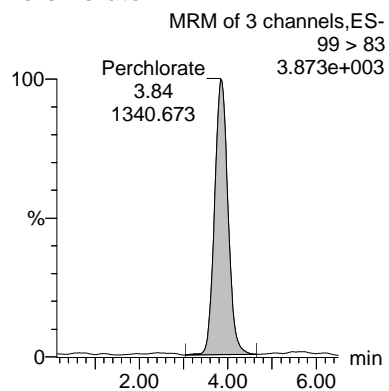
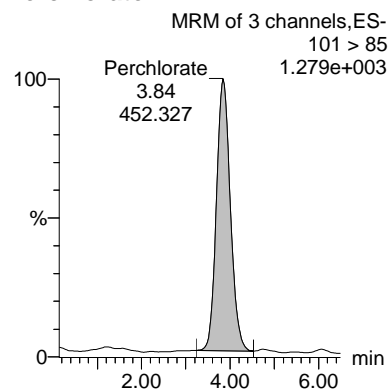
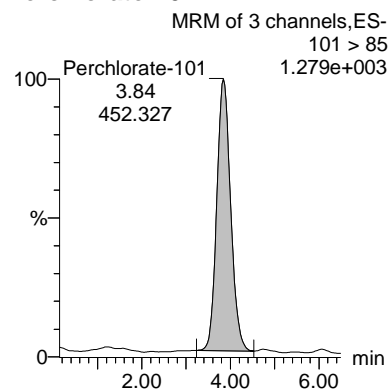
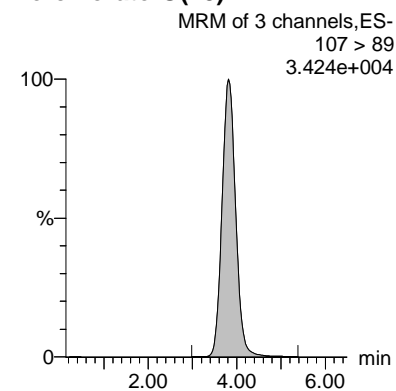
Page 25 of 49

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld

GL
03/31/2017CW
03/31/2017

Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

Name: per0330025a
Date: 30-Mar-2017
Time: 21:09:20
ID: WCL170320-08CRI
Vial: 1:2,C

Perchlorate**Perchlorate****Perchlorate-101****Perchlorate-O(18)**

ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.84	1340.673	0.055	bb			0.0512	102.42	2.42	559.474	2.96
WCL170320-08CRI	Perchlorate-101	101 > 85	3.84	452.327	0.019	bb			0.0524	104.74	4.74	230.715	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.81	12092.929	12092.929	bb			0.3759	75.19	-24.81	882.489	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

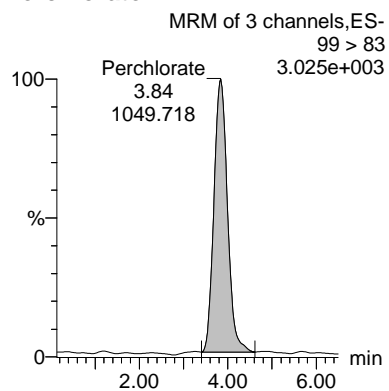
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

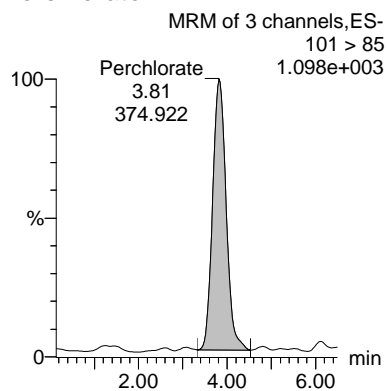
CWW
 03/31/2017

Name: per0330038a
Date: 30-Mar-2017
Time: 23:12:35
ID: WCL170320-08CRI
Vial: 1:2,C

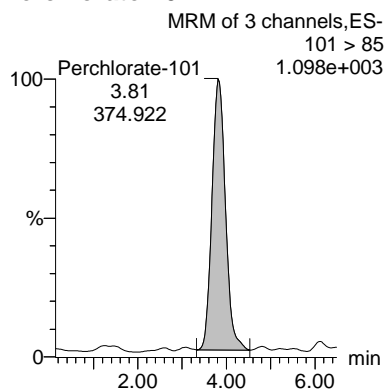
Perchlorate



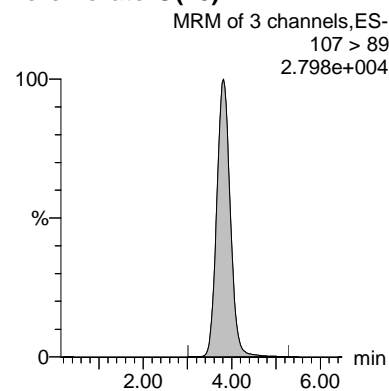
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170320-08CRI	Perchlorate	99 > 83	3.84	1049.718	0.053	bb			0.0494	98.83	-1.17	271.756	2.80
WCL170320-08CRI	Perchlorate-101	101 > 85	3.81	374.922	0.019	bb			0.0535	106.99	6.99	88.129	
WCL170320-08CRI	Perchlorate-O(18)	107 > 89	3.81	9811.959	9811.959	bb			0.3050	61.01	-38.99	3900.5...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1652084Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 30-MAR-17GEL Job No (SDG): 419536GEL Sample ID: 1203758384Date Filtered: 30-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	30-MAR-17 19:15	per0330013a
	Perchlorate-O(18)			0.502	ug/L		1	30-MAR-17 19:15	per0330013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

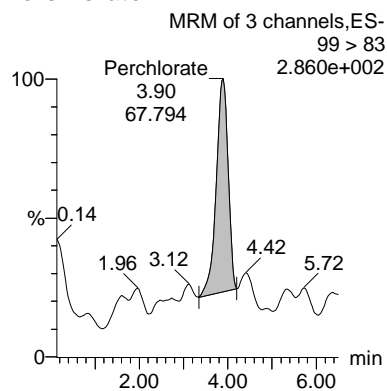
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

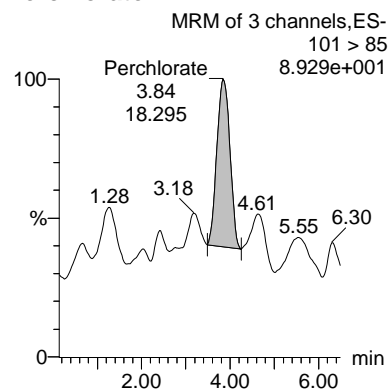
CWW
 03/31/2017

Name: per0330013a
Date: 30-Mar-2017
Time: 19:15:25
ID: 1203758384
Vial: 1:3,A

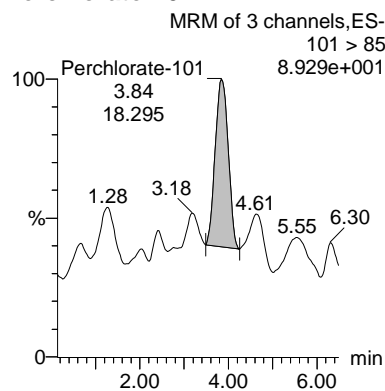
Perchlorate



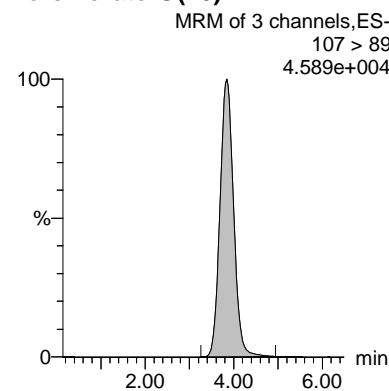
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203758384	Perchlorate	99 > 83	3.90	67.794	0.002	bb			0.0019			14.479 3.71
1203758384	Perchlorate-101	101 > 85	3.84	18.295	0.001	bb			0.0016			3.985
1203758384	Perchlorate-O(18)	107 > 89	3.84	16143.255	16143.255	bb			0.5019	100.37	0.37	2439.0...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1652084Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 30-MAR-17GEL Job No (SDG): 419536GEL Sample ID: 1203758386Date Filtered: 30-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	30-MAR-17 19:24	per0330014a
	Perchlorate-O(18)			0.335	ug/L		1	30-MAR-17 19:24	per0330014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report **MassLynx 4.0 SP4**
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: Untitled

GL
 03/31/2017

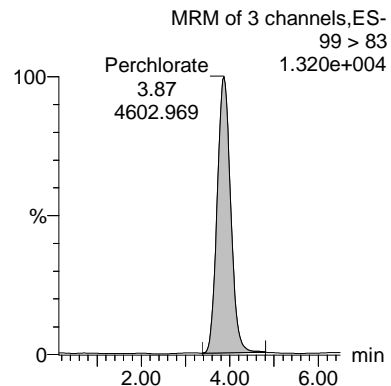
CWW
 03/31/2017

Last Altered: Friday, March 31, 2017 12:57:05 PM Eastern Daylight Time
 Printed: Friday, March 31, 2017 12:58:35 PM Eastern Daylight Time

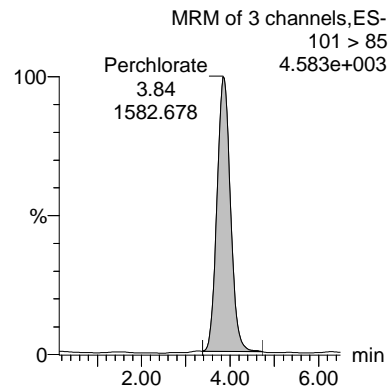
Method: C:\MassLynx\Perchlorate.PROMethDB\per032217a.mdb 31 Mar 2017 09:14:12
 Calibration: 31 Mar 2017 12:57:04

Name: per0330014a
 Date: 30-Mar-2017
 Time: 19:24:55
 ID: 1203758386
 Vial: 1:3,B

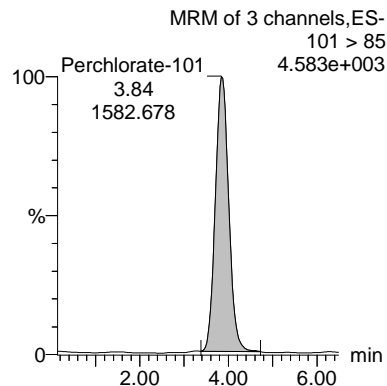
Perchlorate



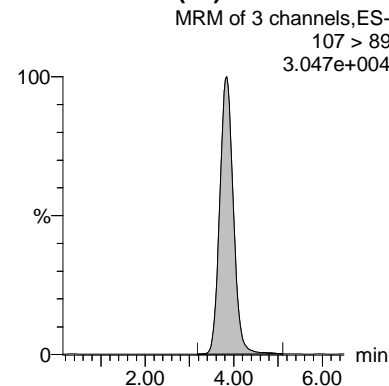
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758386	Perchlorate	99 > 83	3.87	4602.969	0.213	bb			0.1971	98.53	-1.47	767.790	2.91
1203758386	Perchlorate-101	101 > 85	3.84	1582.678	0.073	bb			0.2054	102.69	2.69	917.385	
1203758386	Perchlorate-O(18)	107 > 89	3.84	10789.488	10789.488	bb			0.3354	67.08	-32.92	1841.5...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 419536

GEL Sample ID: 1203758666

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.205	ug/L		1	30-MAR-17 19:34	per0330015a
	Perchlorate-O(18)			0.343	ug/L		1	30-MAR-17 19:34	per0330015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

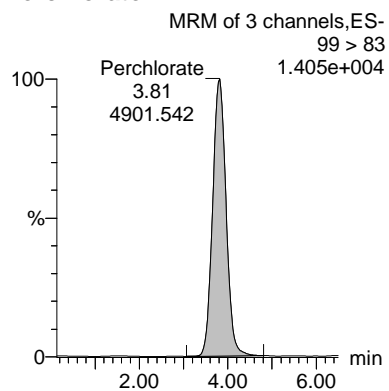
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

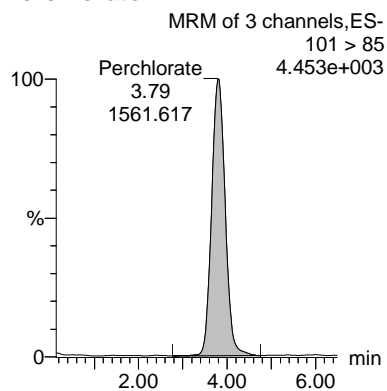
CWW
 03/31/2017

Name: per0330015a
Date: 30-Mar-2017
Time: 19:34:26
ID: 1203758666
Vial: 1:3,C

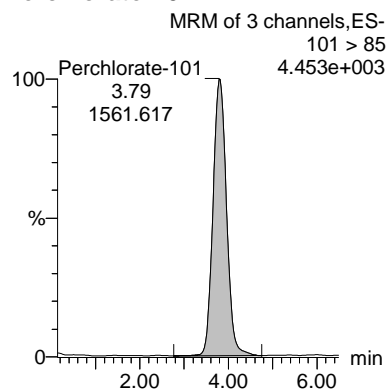
Perchlorate



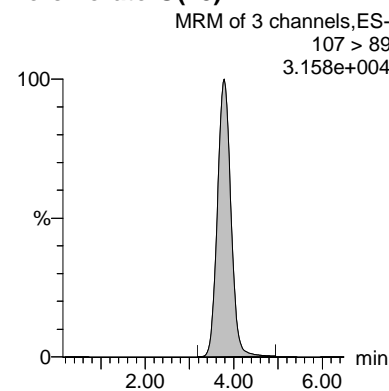
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758666	Perchlorate	99 > 83	3.81	4901.542	0.222	bb			0.2050	102.51	2.51	933.183	3.14
1203758666	Perchlorate-101	101 > 85	3.79	1561.617	0.071	bb			0.1980	98.99	-1.01	398.228	
1203758666	Perchlorate-O(18)	107 > 89	3.79	11043.403	11043.403	bb			0.3433	68.66	-31.34	2616.7...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRABMS

Date Received: 30-MAR-17

GEL Job No (SDG): 419536

GEL Sample ID: 1203758388

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	4.03	ug/L		4	30-MAR-17 21:28	per0330027a
	Perchlorate-O(18)			1.43	ug/L		4	30-MAR-17 21:28	per0330027a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

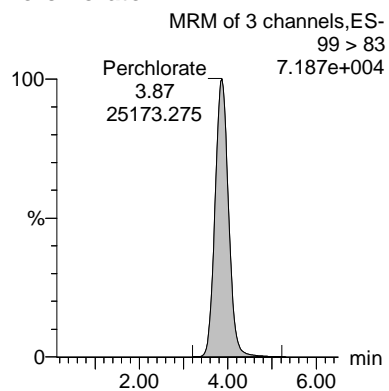
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

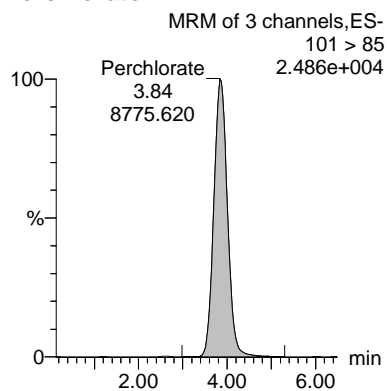
CWW
 03/31/2017

Name: per0330027a
Date: 30-Mar-2017
Time: 21:28:17
ID: 1203758388
Vial: 1:4,E

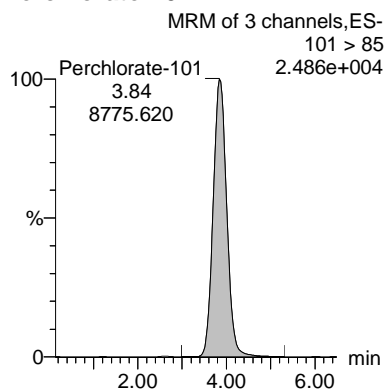
Perchlorate



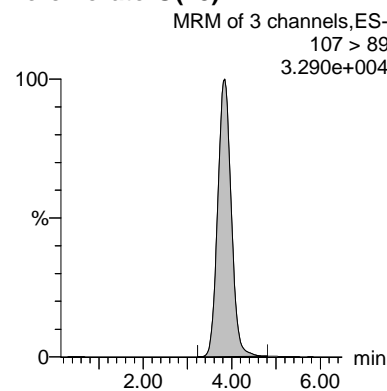
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758388	Perchlorate	99 > 83	3.87	25173.275	1.091	bb			1.0079	503.93	403.93	3264.3...	2.87
1203758388	Perchlorate-101	101 > 85	3.84	8775.620	0.380	bb			1.0649	532.47	432.47	2072.8...	
1203758388	Perchlorate-O(18)	107 > 89	3.84	11537.072	11537.072	bb			0.3587	71.73	-28.27	940.511	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1652084

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6428-GRABMSD

Date Received: 30-MAR-17

GEL Job No (SDG): 419536

GEL Sample ID: 1203758390

Date Filtered: 30-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.2	.8	3.78	ug/L		4	30-MAR-17 21:37	per0330028a
	Perchlorate-O(18)			1.28	ug/L		4	30-MAR-17 21:37	per0330028a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

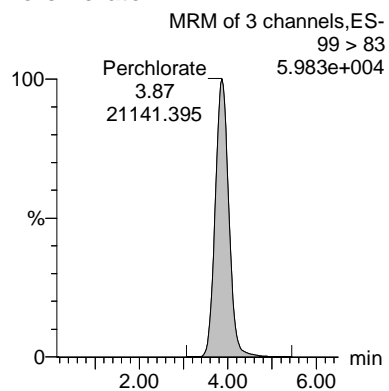
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

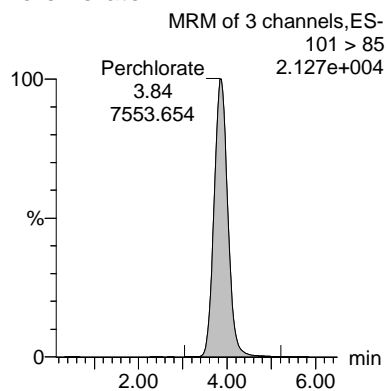
CWW
 03/31/2017

Name: per0330028a
Date: 30-Mar-2017
Time: 21:37:45
ID: 1203758390
Vial: 1:4,F

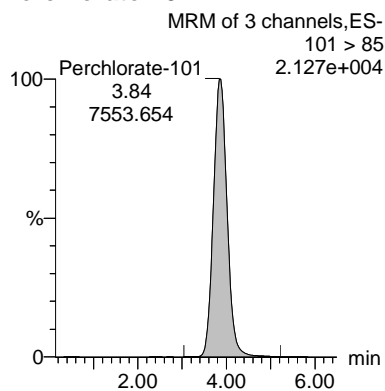
Perchlorate



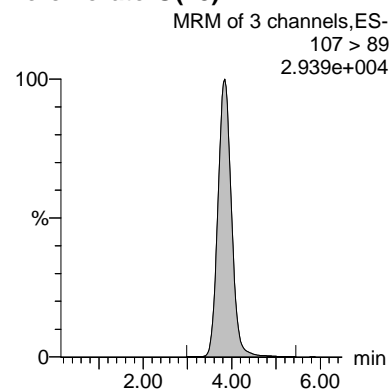
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203758390	Perchlorate	99 > 83	3.87	21141.395	1.023	bb			0.9453	472.67	372.67	4792.7...	2.80
1203758390	Perchlorate-101	101 > 85	3.84	7553.654	0.366	bb			1.0238	511.88	411.88	1230.5...	
1203758390	Perchlorate-O(18)	107 > 89	3.84	10330.044	10330.044	bb			0.3211	64.23	-35.77	4589.8...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	30-MAR-17	per0330001a	IPB001
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330001a	IPB001
Perchlorate	0.00	0	NA	30-MAR-17	per0330002a	IPB001
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

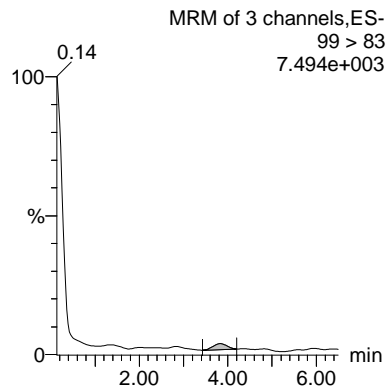
GL
 03/31/2017

CW
 03/31/2017

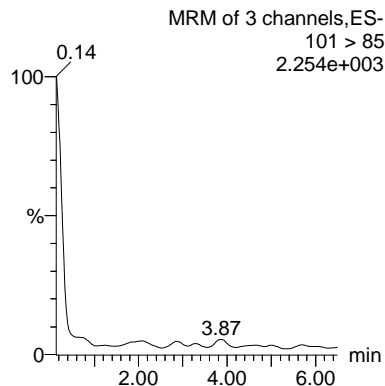
Method: C:\MassLynx\Perchlorate.PRO\MethDB\per033017a.mdb 31 Mar 2017 09:14:12
 Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per033017a.cdb 31 Mar 2017 09:15:51

Name: per0330001a
 Date: 30-Mar-2017
 Time: 17:21:30
 ID: IPB001
 Vial: 1:1,A

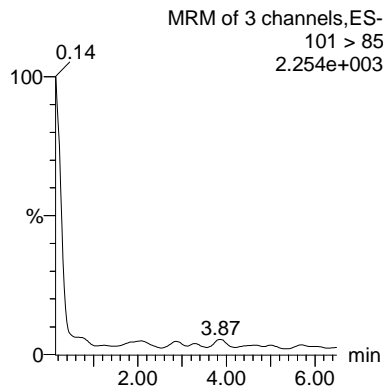
Perchlorate



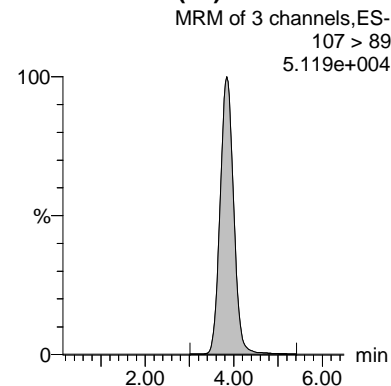
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	3.84	57.775	0.002	bb			0.0015			3.935 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	3.84	18070.672	18070.672	bb			0.5618	112.36	12.36	4495.4...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

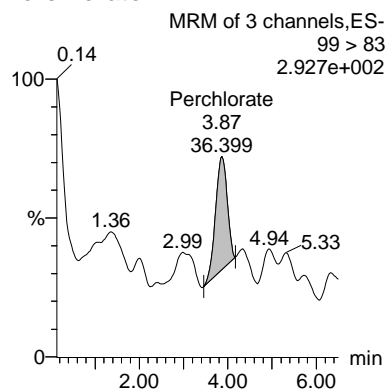
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

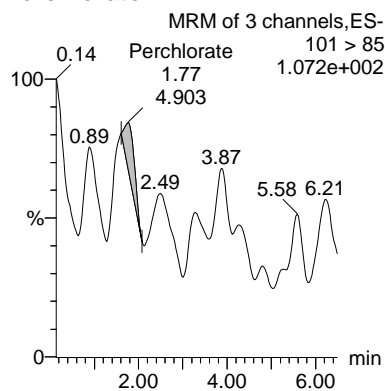
CWJ
 03/31/2017

Name: per0330002a
Date: 30-Mar-2017
Time: 17:31:02
ID: IPB001
Vial: 1:1,A

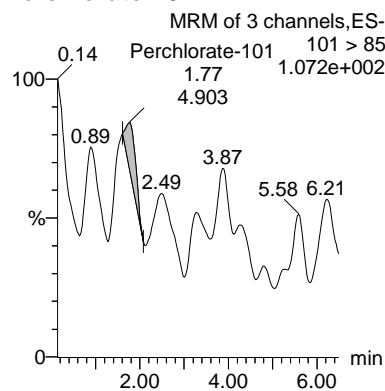
Perchlorate



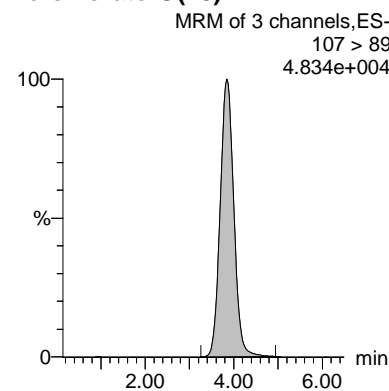
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB001	Perchlorate	99 > 83	3.87	36.399	0.001	bb			0.0010			6.438	7.42
IPB001	Perchlorate-101	101 > 85	1.77	4.903	0.000	bb			0.0004			3.198	
IPB001	Perchlorate-O(18)	107 > 89	3.84	17059.746	17059.746	bb			0.5303	106.07	6.07	2693.6...	

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 419536Lab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	30-MAR-17	per0330009a	IPB002
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330009a	IPB002
Perchlorate	0.00	0	NA	30-MAR-17	per0330011a	IPB003
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330011a	IPB003
Perchlorate	0.00	0	NA	30-MAR-17	per0330018a	IPB004
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330018a	IPB004
Perchlorate	0.00	0	NA	30-MAR-17	per0330024a	IPB005
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330024a	IPB005
Perchlorate	0.00	0	NA	30-MAR-17	per0330030a	IPB006
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330030a	IPB006
Perchlorate	0.00	0	NA	30-MAR-17	per0330037a	IPB007
Perchlorate-101	0.00	0	NA	30-MAR-17	per0330037a	IPB007

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

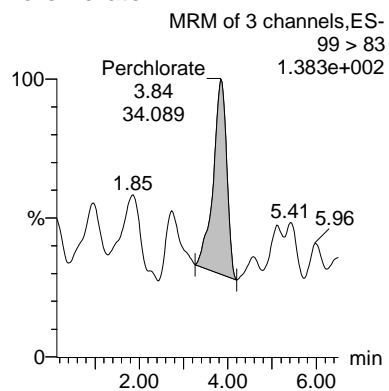
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

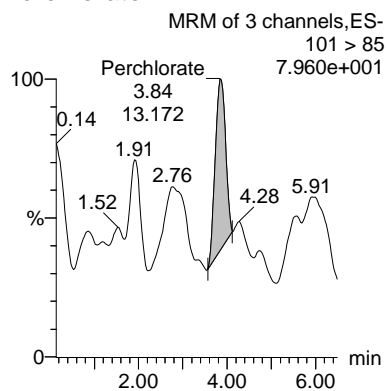
CW
 03/31/2017

Name: per0330009a
Date: 30-Mar-2017
Time: 18:37:27
ID: IPB002
Vial: 1:1,A

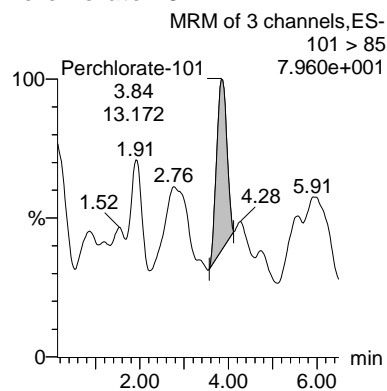
Perchlorate



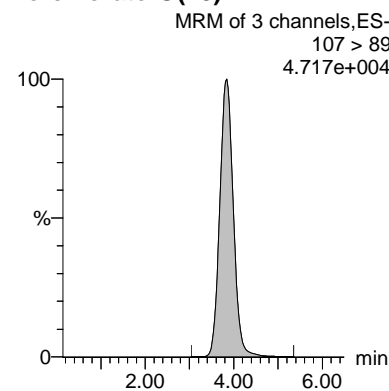
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB002	Perchlorate	99 > 83	3.84	34.089	0.001	bb			0.0009			4.254	2.59
IPB002	Perchlorate-101	101 > 85	3.84	13.172	0.000	bb			0.0011			4.980	
IPB002	Perchlorate-O(18)	107 > 89	3.84	16603.346	16603.346	bb			0.5162	103.23	3.23	1512.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

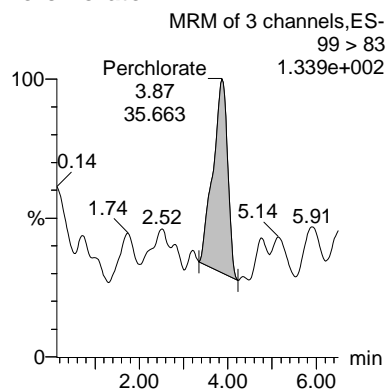
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

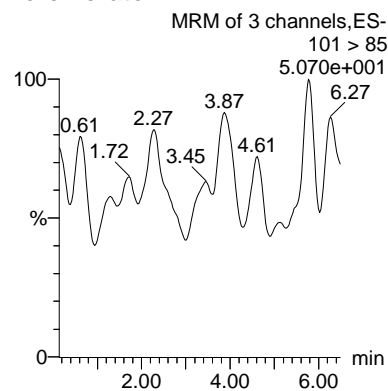
CW
 03/31/2017

Name: per0330011a
Date: 30-Mar-2017
Time: 18:56:25
ID: IPB003
Vial: 1:1,A

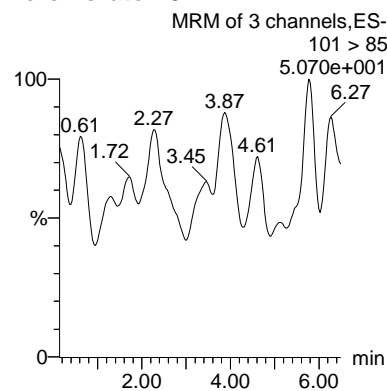
Perchlorate



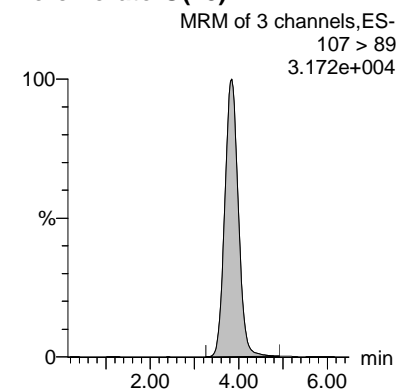
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	3.87	35.663	0.002	bb			0.0015			9.124 0.00
IPB003	Perchlorate-101	101 > 85										
IPB003	Perchlorate-O(18)	107 > 89	3.84	11149.793	11149.793	bb			0.3466	69.32	-30.68	1138.6...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

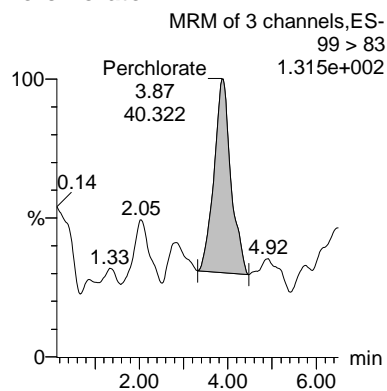
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

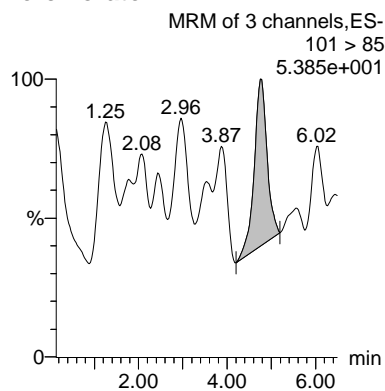
CW
 03/31/2017

Name: per0330018a
Date: 30-Mar-2017
Time: 20:02:53
ID: IPB004
Vial: 1:1,A

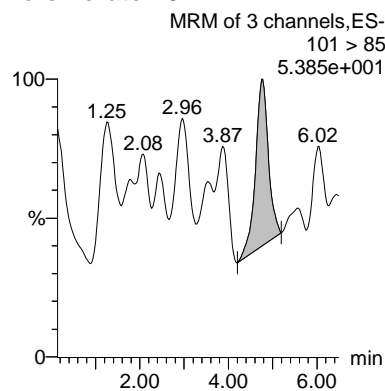
Perchlorate



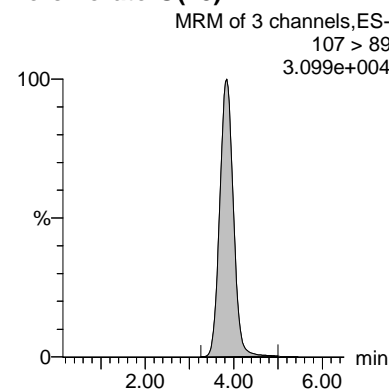
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB004	Perchlorate	99 > 83	3.87	40.322	0.002	bb			0.0017			4.510	3.72
IPB004	Perchlorate-101	101 > 85	4.75	10.837	0.000	bb			0.0014			3.389	
IPB004	Perchlorate-O(18)	107 > 89	3.84	10958.610	10958.610	bb			0.3407	68.14	-31.86	4966.6...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

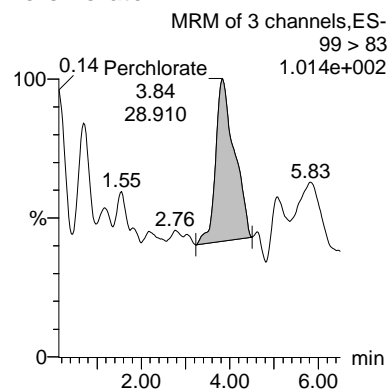
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
 Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
 Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

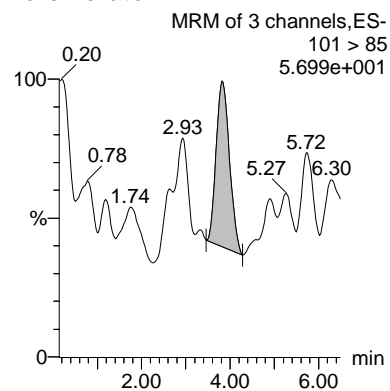
CW
 03/31/2017

Name: per0330024a
Date: 30-Mar-2017
Time: 20:59:51
ID: IPB005
Vial: 1:1,A

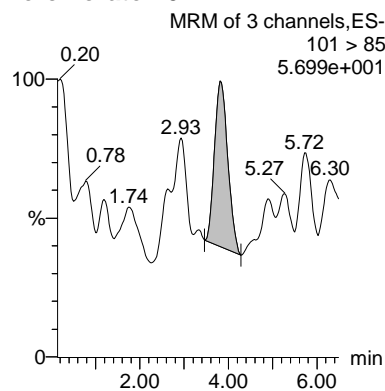
Perchlorate



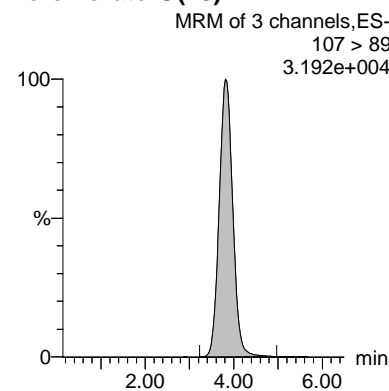
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
IPB005	Perchlorate	99 > 83	3.84	28.910	0.001	bb			0.0012			4.003	2.45
IPB005	Perchlorate-101	101 > 85	3.81	11.780	0.001	bb			0.0015			2.815	
IPB005	Perchlorate-O(18)	107 > 89	3.81	11203.155	11203.155	bb			0.3483	69.66	-30.34	2650.8...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

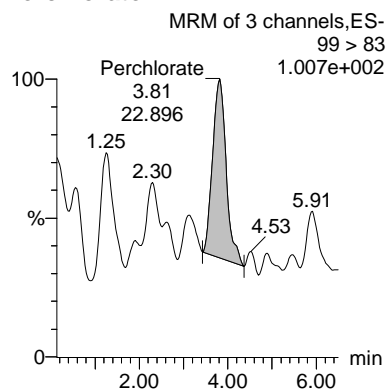
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

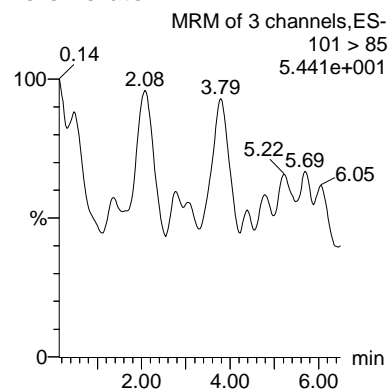
CW
 03/31/2017

Name: per0330030a
Date: 30-Mar-2017
Time: 21:56:44
ID: IPB006
Vial: 1:1,A

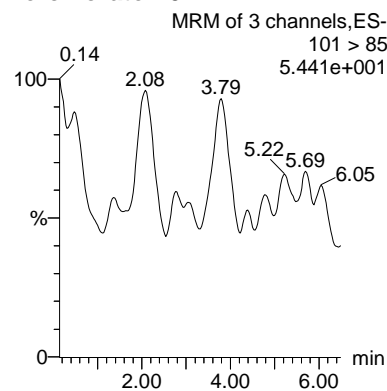
Perchlorate



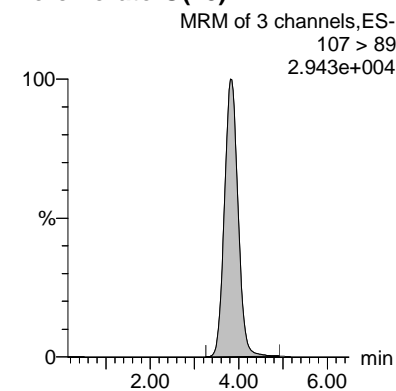
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB006	Perchlorate	99 > 83	3.81	22.896	0.001	bb			0.0010			2.958 0.00
IPB006	Perchlorate-101	101 > 85										
IPB006	Perchlorate-O(18)	107 > 89	3.81	10384.417	10384.417	bb			0.3228	64.57	-35.43	4431.8...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

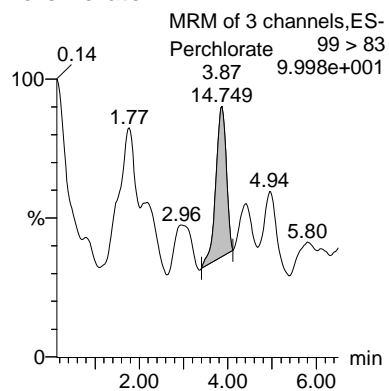
Dataset: C:\MassLynx\Perchlorate.PRO\per033017a.qld
Last Altered: Friday, March 31, 2017 9:15:52 AM Eastern Daylight Time
Printed: Friday, March 31, 2017 10:08:22 AM Eastern Daylight Time

GL
 03/31/2017

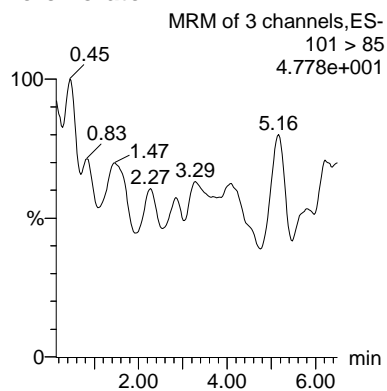
CW
 03/31/2017

Name: per0330037a
Date: 30-Mar-2017
Time: 23:03:07
ID: IPB007
Vial: 1:1,A

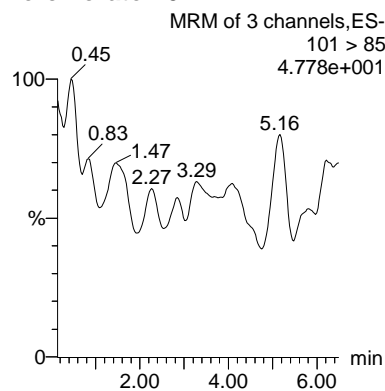
Perchlorate



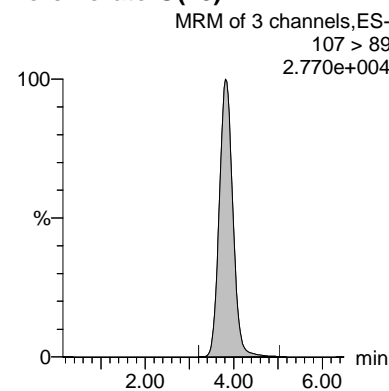
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB007	Perchlorate	99 > 83	3.87	14.749	0.001	bb			0.0007			8.637 0.00
IPB007	Perchlorate-101	101 > 85										
IPB007	Perchlorate-O(18)	107 > 89	3.81	9721.696	9721.696	bb			0.3022	60.45	-39.55	2595.4...

Miscellaneous

Prep Logbook

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1652084 Verified by: _____
 Analyst: Grace Cappelmann
 Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
 Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203758384 MB	30-MAR-2017 14:30:00	10	10	1
1203758386 LCS	30-MAR-2017 14:30:00	10	10	1
1203758666 ICS	30-MAR-2017 14:30:00	10	10	1
418779005	30-MAR-2017 14:30:00	10	10	1
418779006	30-MAR-2017 14:30:00	10	10	1
1203758387 MS (418779006)	30-MAR-2017 14:30:00	10	10	1
1203758389 MSD (418779006)	30-MAR-2017 14:30:00	10	10	1
418779011	30-MAR-2017 14:30:00	10	10	1
419533001	30-MAR-2017 14:30:00	10	10	1
1203758388 MS (419533001)	30-MAR-2017 14:30:00	10	10	1
1203758390 MSD (419533001)	30-MAR-2017 14:30:00	10	10	1
419536001	30-MAR-2017 14:30:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203758666	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	De-salting cartridge: 161107-2.5-Ba/Ag/H
LCS	1203758386	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203758387	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203758388	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203758389	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203758390	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

Cww

03/31/2017

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/30/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per033017a

Mobile Phase Lot#: 2523118, 2457559

SOP: GL-OA-E-067

Initial Calibration Date: 03/30/17

Standard-Samp Reagent Lot#.: 2457559

Alt Check Std. ID: WCL170320-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0330001a	IPB01	GXC1	3/30/2017 17:21			1		USE	B
per0330002a	IPB01	GXC1	3/30/2017 17:31			1		USE	B
per0330003a	WCLICAL-01	GXC1	3/30/2017 17:40			1		USE	I
per0330004a	WCLICAL-02	GXC1	3/30/2017 17:50			1		USE	I
per0330005a	WCLICAL-03	GXC1	3/30/2017 17:59			1		USE	I
per0330006a	WCLICAL-04	GXC1	3/30/2017 18:09			1		USE	I
per0330007a	WCLICAL-05	GXC1	3/30/2017 18:18			1		USE	I
per0330008a	WCLICAL-06	GXC1	3/30/2017 18:27			1		USE	I
per0330009a	IPB02	GXC1	3/30/2017 18:37			1		USE	B
per0330010a	WCLICV	GXC1	3/30/2017 18:46			1		USE	C
per0330011a	IPB03	GXC1	3/30/2017 18:56			1		USE	B
per0330012a	WCLCRI	GXC1	3/30/2017 19:05			1		USE	C
per0330013a	1203758384	GXC1	3/30/2017 19:15	1652086	Various	1	Various	USE	S
per0330014a	1203758386	GXC1	3/30/2017 19:24	1652086	Various	1	Various	USE	S
per0330015a	1203758666	GXC1	3/30/2017 19:34	1652086	Various	1	Various	USE	S
per0330016a	418779005	GXC1	3/30/2017 19:43	1652086	418779	2	AMIP	DUSE	S
per0330017a	418779005	GXC1	3/30/2017 19:53	1652086	418779	1	AMIP	USE	S
per0330018a	IPB04	GXC1	3/30/2017 20:02			1		USE	B
per0330019a	418779006	GXC1	3/30/2017 20:12	1652086	418779	1	AMIP	USE	S
per0330020a	1203758387	GXC1	3/30/2017 20:21	1652086	418779	1	AMIP	USE	S
per0330021a	1203758389	GXC1	3/30/2017 20:31	1652086	418779	1	AMIP	USE	S
per0330022a	418779011	GXC1	3/30/2017 20:40	1652086	418779	1	AMIP	USE	S
per0330023a	WCLCCV	GXC1	3/30/2017 20:50			1		USE	C
per0330024a	IPB05	GXC1	3/30/2017 20:59			1		USE	B
per0330025a	WCLCRI	GXC1	3/30/2017 21:09			1		USE	C
per0330026a	419533001	GXC1	3/30/2017 21:18	1652086	419533	4	MBAC	USE	S
per0330027a	1203758388	GXC1	3/30/2017 21:28	1652086	419533	4	MBAC	USE	S
per0330028a	1203758390	GXC1	3/30/2017 21:37	1652086	419533	4	MBAC	USE	S
per0330029a	419536001	GXC1	3/30/2017 21:47	1652086	419536	10000	MBAC	USE	S

per0330030a	IPB006	GXC1	3/30/2017 21:56			1		USE	B
per0330031a	1203758231	GXC1	3/30/2017 22:06	1652028	Various	1	ARSL	USE	S
per0330032a	1203758232	GXC1	3/30/2017 22:15	1652028	Various	1	ARSL	USE	S
per0330033a	1203758235	GXC1	3/30/2017 22:25	1652028	Various	1	ARSL	USE	S
per0330034a	418920001	GXC1	3/30/2017 22:34	1652028	2017-1230	1	ARSL	USE	S
per0330035a	418933001	GXC1	3/30/2017 22:44	1652028	2017-1226	1	ARSL	USE	S
per0330036a	WCLCCV	GXC1	3/30/2017 22:53			1		USE	C
per0330037a	IPB007	GXC1	3/30/2017 23:03			1		USE	B
per0330038a	WCLCRI	GXC1	3/30/2017 23:12			1		USE	C
per0330039a	1203758233	GXC1	3/30/2017 23:22	1652028	2017-1226	1	ARSL	USE	S
per0330040a	1203758234	GXC1	3/30/2017 23:31	1652028	2017-1226	1	ARSL	USE	S
per0330041a	418933005	GXC1	3/30/2017 23:41	1652028	2017-1226	1	ARSL	USE	S
per0330042a	418933007	GXC1	3/30/2017 23:50	1652028	2017-1226	1	ARSL	USE	S
per0330043a	418933011	GXC1	3/31/2017 0:00	1652028	2017-1226	1	ARSL	USE	S
per0330044a	419384001	GXC1	3/31/2017 0:09	1652028	2017-1264	1	ARSL	USE	S
per0330045a	WCLCCV	GXC1	3/31/2017 0:18			1		USE	C
per0330046a	IPB008	GXC1	3/31/2017 0:28			1		USE	B
per0330047a	WCLCRI	GXC1	3/31/2017 0:37			1		USE	C
per0330048a	O-18 Screen UCL1	GXC1	3/31/2017 0:47	Screen		1	GEL	USE	S
per0330049a	ICAL STD Screen L	GXC1	3/31/2017 0:56	Screen		1	GEL	USE	S

DATA EXCEPTION REPORT

Mo.Day Yr. 31-MAR-17	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846-6850 Modified	Matrix Type: Liquid	Client Code: MBAC001
Batch ID: 1652086	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 419533,419536			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. In 1203758390 (MSD) a 0% recovery was observed, which is out of the acceptance range of 75-125%. The detected concentration in the MSD was lower than that detected in the parent sample.		1. The outlier observed for the MSD was due to the background concentration in the parent sample, 419533001 (LH18/24-SP650-6) and the need of a 1:4 dilution prior to analysis. Will report data and note in case narrative.	

Originator's Name:

Grace Cappelmann 31-MAR-17

Data Validator/Group Leader:

Charles Wilson 31-MAR-17

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.

**ANALYTICAL DATA PACKAGE**

SDG # 1701251

PROJECT NAME: Perchlorate**SUBMITTAL TO:**

Stephanie Mossburg
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, OH 45750

SUBMITTAL BY:

Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (866)417-0548

LABORATORY CONTACT PERSON:

Project Manager: Sonya Gordon
Tel (615)345-1115
Fax (866)417-0548
Email: sgordon@empirlabs.com

Original Report Date: February 07, 2017

Report Revision #: N/A

Revision Date: N/A

THIS DOCUMENT MEETS DoD QSM 5.0 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Data Review Manager, Ms. Amy Barnett, is responsible for the final data produced and reported. Her signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

L-A-B Accredited - Certificate Number L2226 - Testing

Table of Contents

#	Description
1	Cover Page
2	Table of Contents
3	Case Narrative
4	Sample Receipt Information Chain of Custody Forms Sample Receipt Confirmations WorkOrder Summary Sample Delivery Group (SDG) Sheets
5	Data for Perchlorate Required Data / QAQC / Calibration Forms Supporting Raw Data / Logs

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

This is an original submittal of the final report package.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

Perchlorate:

No anomalies or deviations are noted.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- DL:** The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** Exceeding quality control criteria are associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.
- H:** The result was analyzed, extracted, or received outside of the EPA recommended holding time.
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it

indicates that the parameters DL/LOD/LOQ have been raised.

- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.
- Q:** The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.
- S:** The associated internal standard exceeded criteria.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.
- X:** The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.
- Y:** The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.
- Z:** The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

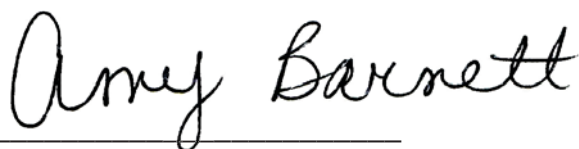
- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to

assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.
- MS:** The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.
- IDs:** The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Ms. Amy M. Barnett
Data Review Manager

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 01/18/2017)

00841716

DoD ELAP QSM5.0, Certificate Number L2226

- Aqueous
- Non-aqueous
- Expires: 11/30/2018

State of Florida, Department of Health – NELAP Primary, Lab ID: E87646

- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2017

State of Georgia, Environmental Protection Agency – NELAP, Self Certification

- Expires: 06/30/2017

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017

- Wastewater
- Expires: 12/31/2017

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77

- Aqueous
- Non-aqueous
- Expires: 06/30/2017

State of New Jersey, Department of Environmental Protection – NELAP, Lab ID: TN473

- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2017

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-16-14

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Utah, Department of Health – NELAP, Certificate Number: TN0042016-8

- Aqueous
- Non-aqueous
- Expires: 07/31/2017

**Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 8924,
Lab ID: 460243**

- Aqueous
- Non-aqueous
- Expires: 12/14/2017

State of Washington, Department of Ecology – NELAP, Lab ID: C934-16

- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2017

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg)} * \text{Expected Vol/Weight (mL or g)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL)} * \text{Final Vol (ml)} * \text{Dilution} * (1000\text{uL/mL})}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL)} * \text{Final Vol (mL)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Sample Receipt Information



1701251-01 A

CAL (615) 345-1115 ATTN: SONYA GORDON

Page 1 of 1

CHAIN OF CUSTODY

Project: **AECOM**
 LONGHORN ARMY AMMN. PLANT (LHAAP)
 GROUNDWATER TREATMENT PLANT (GWTP)
 KARNACK, TEXAS

Project No.
 60256135.GWTPT
 HRUMAR16

Job:
**GROUNDWATER TREATMENT PLANT
 SPECIAL SAMPLES**

Prepared By:
Scott Beesinger

Field Sample I.D.
LH18/24-SP650-6416-Grab

Sample Matrix
Water

Date / Time
 01/30/17 / 15:00

MS / MSD
 No. OF CONTAINERS
1

Analyses
PERCHLORATE

Remarks
 (Preservatives,
 etc.)

Lab I.D.#

Additional Remarks: **24 HOUR TAT** Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	42/42/16	15:30									
	1/30/17										

For Lab Use Only			
Received At Lab By:	Date	Time	Airbill No.
<i>[Signature]</i>	1/31/17	0940	
Remarks:			

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 1/31/17@0850-940

Work-order# 1701251

- 1. Tracking # 2818 (last 4 digits, FedEx)
Courier: Fedex UPS
- 2. Temperature of rep. sample or temp blank when opened: 4.7 °C + correction factor (-0.1) = 4.6 °C
(Temp Fluke#1 SN17680086)
- 3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA
- 4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: 1 front
- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 1/31/17

- 7. Were custody seals on containers: YES NO and Intact YES...NO... NA
Were these signed and dated correctly? YES...NO... NA
- 8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc.)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13. a. Were VOA vials received? YES... NO...NA
- b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO... NA
- 14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO... NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 1/31/17

- 15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO... NA
- b. Did the bottle labels indicate that the correct preservatives were used? YES...NO... NA
- 16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documentated? YES...NO... NA
- 17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documentated? YES...NO... NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) TH 1/31/17

- 18. Were custody papers properly filled out (ink, signed, etc.)? YES...NO...NA
- 19. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 20. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO... NA
- 21. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO... NA
- 22. Were there Non-Conformance issues at login? YES... NO...NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) TH 1/31/17

I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) _____ 1/31/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 1/31/17


Empirical Laboratories, LLC
WORK ORDER
1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division
Project: Perchlorate
Project Manager: Sonya Gordon
Project Number: MIC_Perc
Report To:

 Microbac Laboratories, Inc.-Ohio Valley Division
 Emily Yoak
 158 Starlite Drive
 Marietta, OH 45750
 Phone: (740) 373-4071
 Fax: (740) 373-4835

Invoice To:

 Microbac Laboratories, Inc.-Ohio Valley Division
 Stephanie Mossburg
 158 Starlite Drive
 Marietta, OH 45750
 Phone : (740) 373-4071
 Fax: (740) 373-4835

Date Due: 02/01/2017 16:00 (1 day TAT)

Date Received: 01/31/2017 09:40

Logged In By: Tiana L. Hutchings

Received By: Tiana L. Hutchings

 Samples Received at: **4.6°C**

Custody Seals Yes Received On Ice Yes

Containers Intact Yes

COC/Labels Agree Yes

Preservation Confirmed No

Analysis	TAT	Expires	Version	Comments
1701251-01 LH18/24-SP650-6416-Grab [Water] Sampled 01/30/2017				
15:00 (GMT-06:00) Central Time (US & Canada)				
LCMS_PERC_6850_Q5	1	02/27/2017 15:00		

Data and Forms For Perchlorates

Sample Extraction Data

Prep Method: PERC_6850_W-SW6850

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [mL]	Final [mL]	Dilution	% Solids	Notes	Date
1701251-01 [LH18/24-SP650-6416-Grab]	7A31017	10.00/10.00	10.0	10.0	500.00			01/31/17

ANALYSIS DATA SHEET

LH18/24-SP650-6416-Grab

Laboratory: Empirical Laboratories, LLC SDG: 1701251
 Client: Microbac Laboratories, Inc.-Ohio Vall Project: Perchlorate
 Matrix: Water Laboratory ID: 1701251-01 File ID: PERC000008.D.Report.TXT
 Sampled: 01/30/17 15:00 Prepared: 01/31/17 14:59 Analyzed: 02/02/17 15:46
 Solids: Preparation: PERC 6850 W Dilution: 500
 Batch: 7A31017 Sequence: 7B03207 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	5400	250	500	1000	D

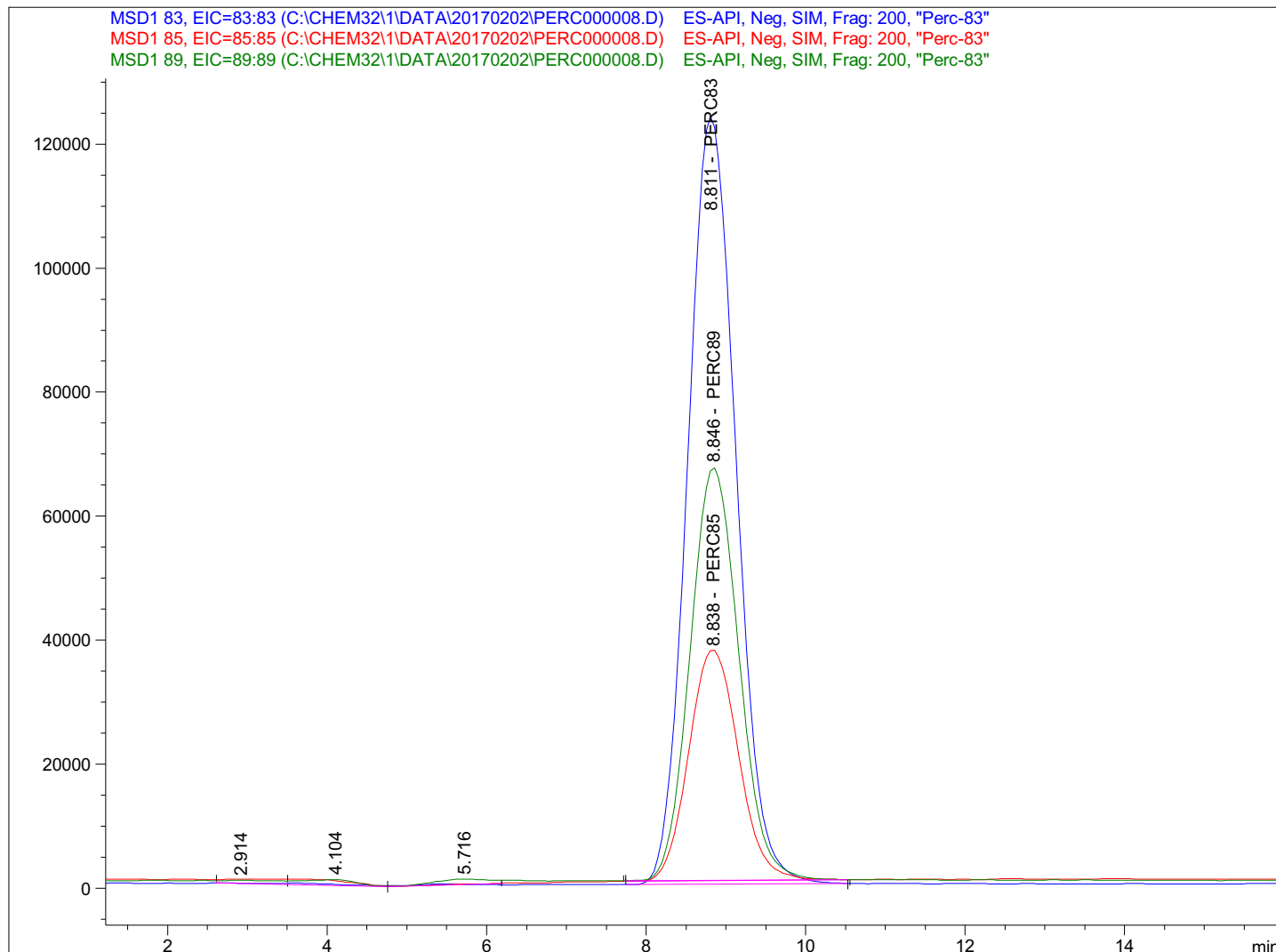
Total Target Analytes Reported 1 Project Analytes: 1

```

=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                   Location  : Vial 6
Injection Date  : 2/2/2017 3:46:55 PM          Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 1/24/2017 3:06:45 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/2/2017 5:48:35 PM
                (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : 2/2/2017 5:47:29 PM
Multiplier     : 1.0000
Dilution      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
# [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                 Location  : Vial 6
Injection Date  : 2/2/2017 3:46:55 PM        Inj       :    1
                                           Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 5:48:35 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.811	BBA	3	5.22029e6	1.17157	10.80096		PERC83

Totals without ISTD(s) : 10.80096

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.838	BBA	3	1.61963e6	3.42345	9.79213		PERC85

Totals without ISTD(s) : 9.79213

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.846	BBA I	3	2.83121e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

LCS / LCS DUPLICATE RECOVERY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1701251
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
 Matrix: Water
 Batch: 7A31017 Laboratory ID: 7A31017-BS1
 Preparation: PERC_6850_W Initial/Final: 10 mL / 10 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Perchlorate	2.000	1.901	95.1	84 - 119

PREPARATION BATCH SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Batch: 7A31017 Batch Matrix: Water Preparation: PERC_6850_W

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
LH18/24-SP650-6416-Grab	1701251-01	01/31/17 14:59	10.00	10.00
Blank	7A31017-BLK1	01/31/17 14:59	10.00	10.00
LCS	7A31017-BS1	01/31/17 14:59	10.00	10.00

ANALYSIS DATA SHEET

Blank

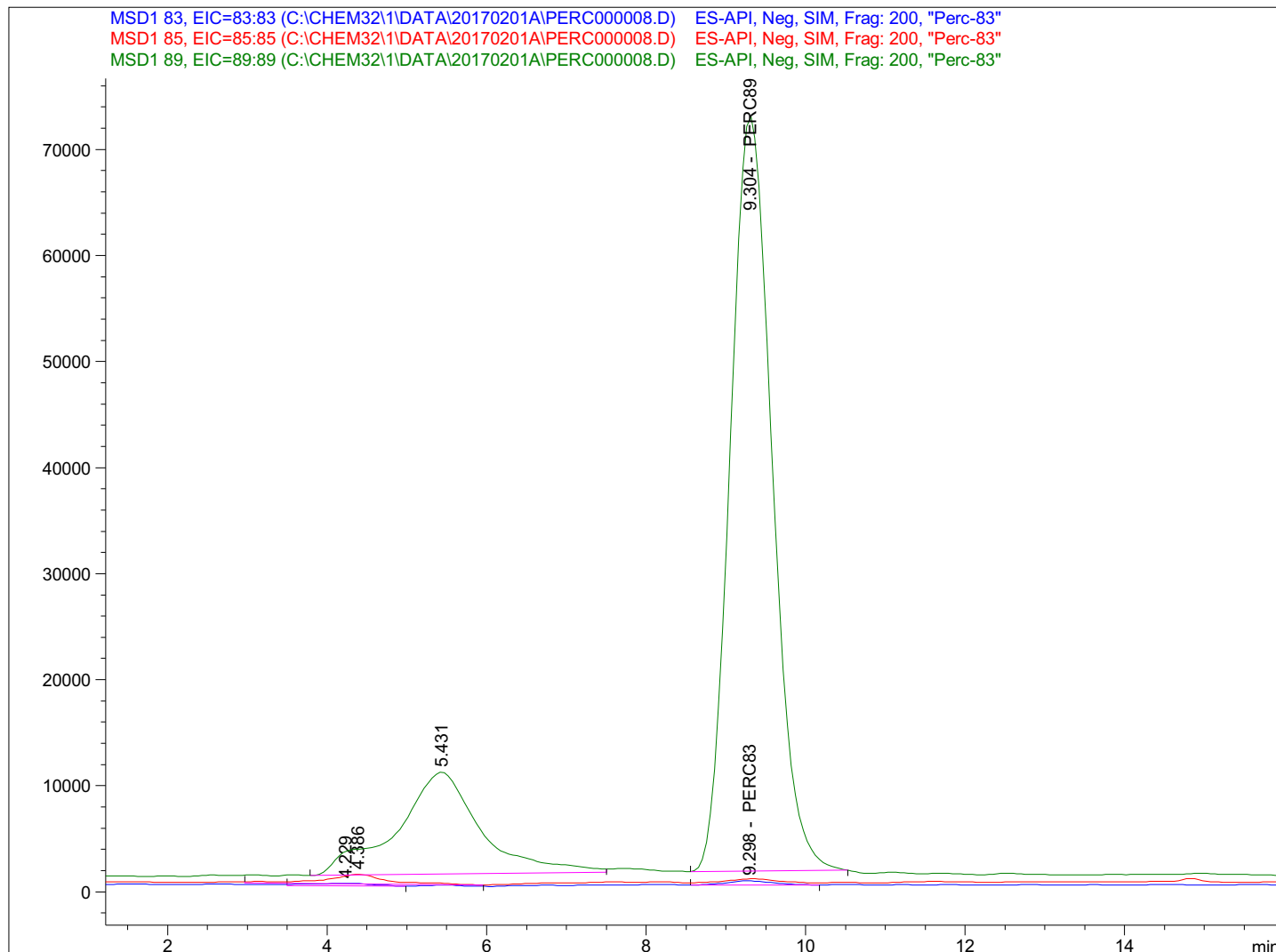
Laboratory: Empirical Laboratories, LLC SDG: 1701251
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
 Matrix: Laboratory ID: 7A31017-BLK1 File ID: PERC000008.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/01/17 16:39
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7A31017 Sequence: 7A03115 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		0.500	1.00	2.00	U

Total Target Analytes Reported: 1


```
=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                  Location  : Vial 6
Injection Date  : 2/1/2017 4:39:56 PM         Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 1/24/2017 3:06:45 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/1/2017 8:55:36 PM
                (modified after loading)
=====
```



Internal Standard Report

```
Sorted By      : Signal
Calib. Data Modified : 2/1/2017 8:53:30 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----
```

```

=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                 Location  : Vial 6
Injection Date  : 2/1/2017 4:39:56 PM        Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:55:36 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.298	BBA	3	1.58974e4	1.17157	3.57285e-2		PERC83

Totals without ISTD(s) : 3.57285e-2

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.300		3	-	-	-		PERC85

Totals without ISTD(s) : 0.00000

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.304	BBA I	3	2.60647e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

*** End of Report ***

ANALYSIS DATA SHEET

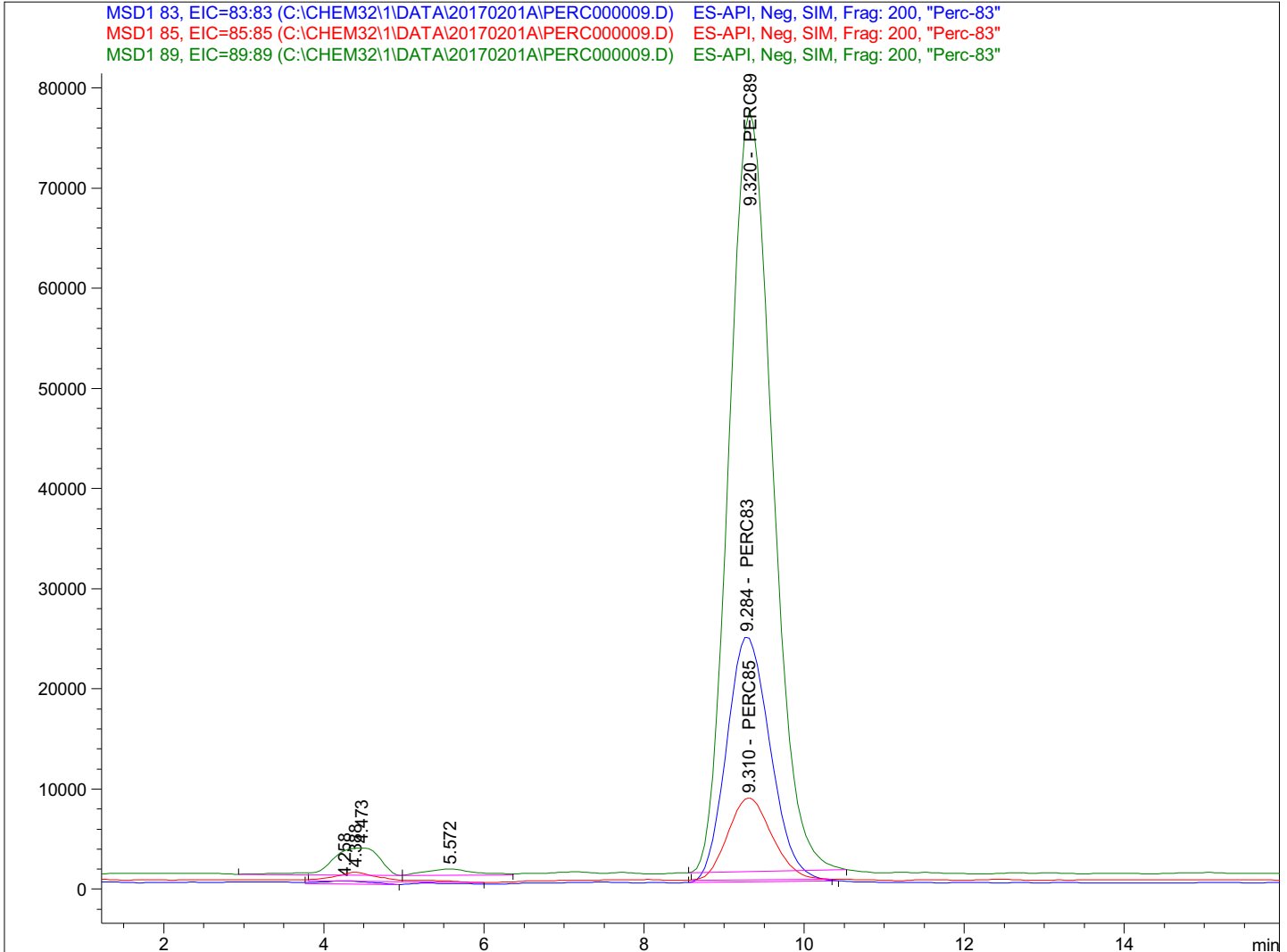
LCS

Laboratory: Empirical Laboratories, LLC SDG: 1701251
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
 Matrix: Laboratory ID: 7A31017-BS1 File ID: PERC000009.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/01/17 16:58
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7A31017 Sequence: 7A03115 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	1.901	0.500	1.00	2.00	J

Total Target Analytes Reported: 1

=====
Acq. Operator : Seq. Line : 9
Acq. Instrument : Instrument 1 Location : Vial 7
Injection Date : 2/1/2017 4:58:47 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 8:58:28 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/1/2017 8:53:30 PM
Multiplier : 1.0000
Dilution : 1.0000

Use Multiplier & Dilution Factor with ISTDs

Sample ISTD Information:

ISTD #	ISTD Amount [ug/l]	Name
--------	--------------------	------

```

=====
Acq. Operator   :                               Seq. Line :    9
Acq. Instrument : Instrument 1                   Location  : Vial 7
Injection Date  : 2/1/2017 4:58:47 PM          Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:58:28 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.284	BBA	3	9.27112e5	1.17157	1.90103		PERC83

Totals without ISTD(s) : 1.90103

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.310	BBA	3	3.11970e5	3.42345	1.86923		PERC85

Totals without ISTD(s) : 1.86923

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.320	BBA I	3	2.85682e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Lab File ID: PERC000002.D.Report.TXT Injection Date: 05/21/16
Instrument ID: LCMS1 Injection Time: 09:46
Sequence: 6E14115 Lab Sample ID: 6E14115-TUN1

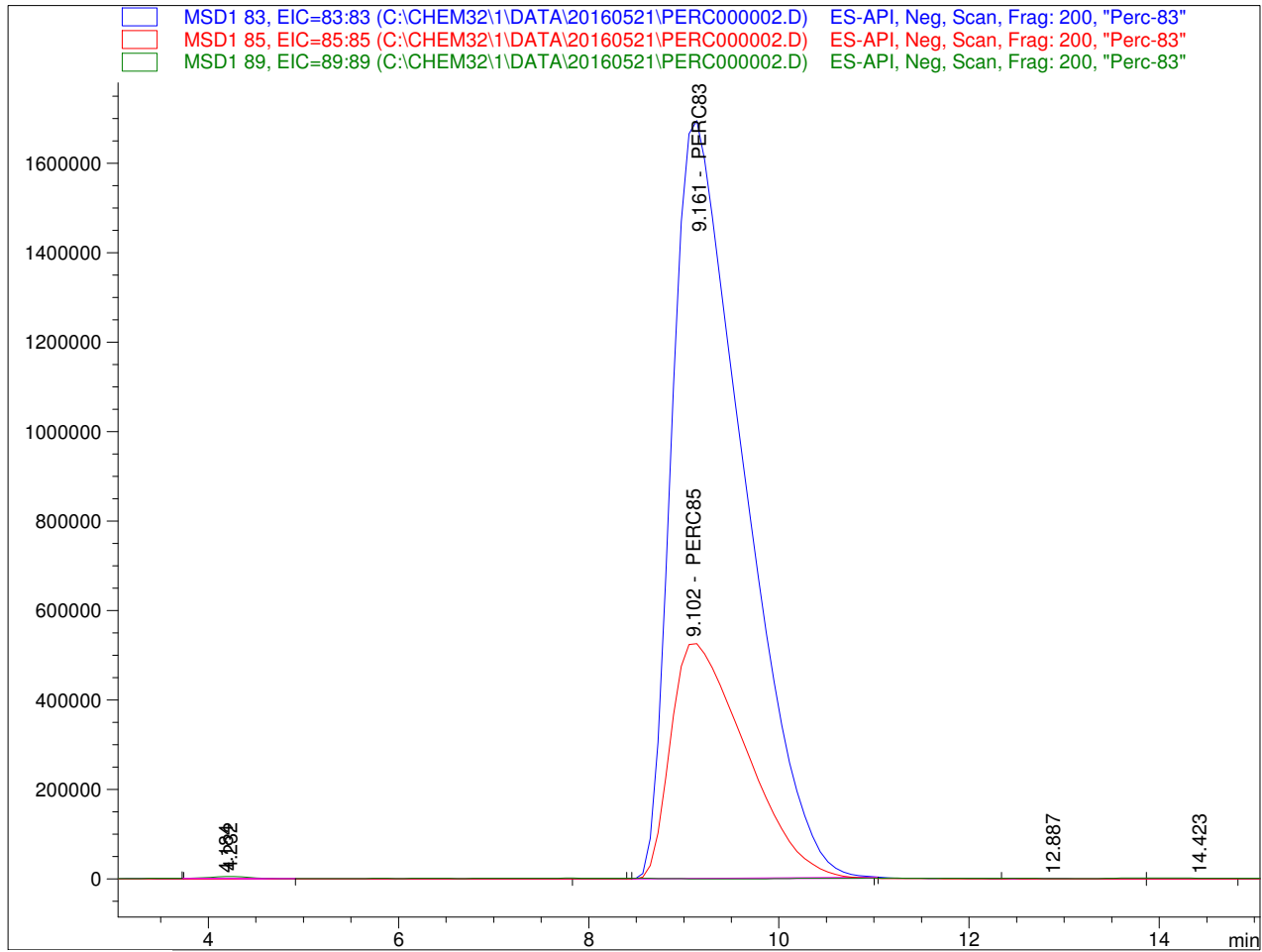
m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

=====

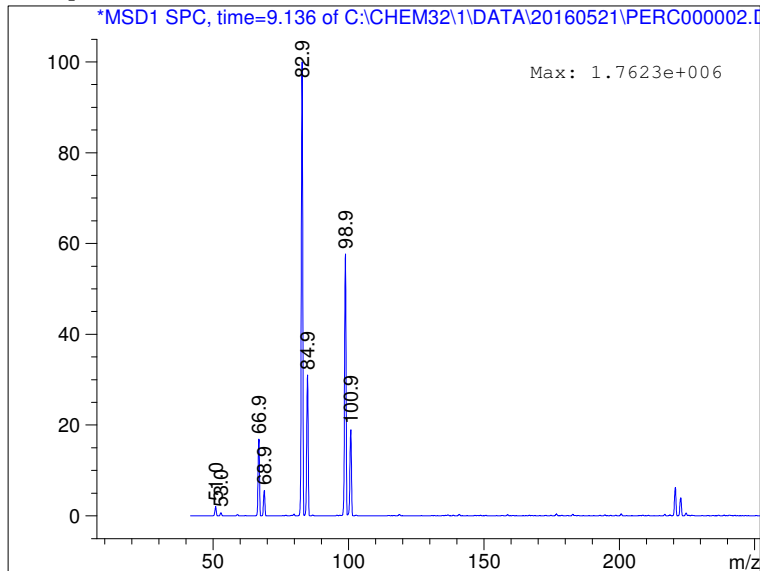
Acq. Operator :	Instrument 1	Seq. Line :	2
Acq. Instrument :	Instrument 1	Location :	Vial 1
Injection Date :	5/21/2016 9:46:07 AM	Inj :	1
		Inj Volume :	100.0 µl

Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed : 5/20/2016 4:13:17 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed : 5/23/2016 5:27:47 PM
(modified after loading)

Current Chromatogram(s)



MS Spectrum



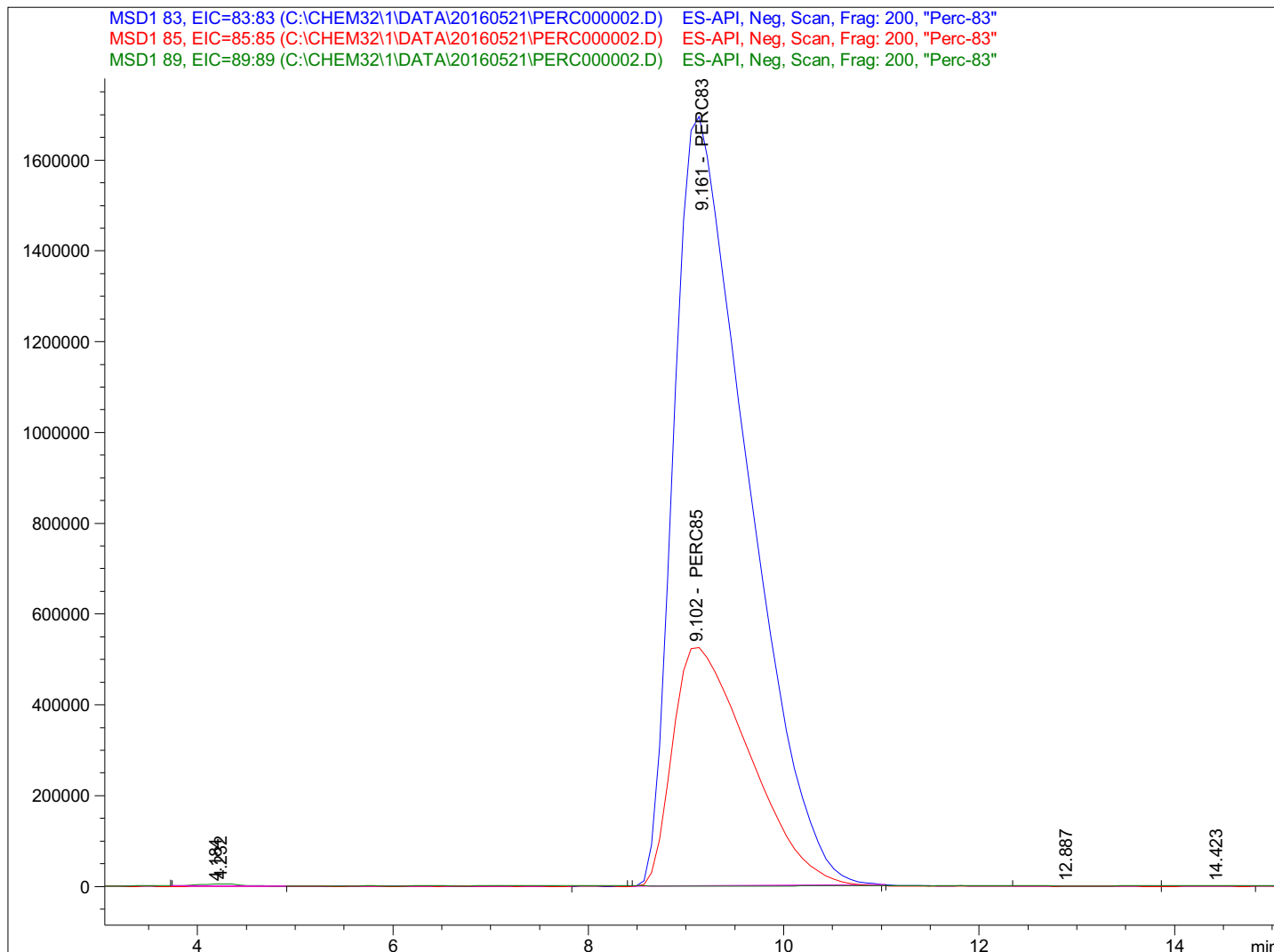
Sample Name: 6E14115-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 5/21/2016 9:46:07 AM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed    : 5/20/2016 4:13:17 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:27:47 PM
                  (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By           : Signal
Calib. Data Modified : 5/23/2016 5:27:55 PM
Multiplier          : 1.0000
Dilution            : 1.0000

```

Use Multiplier & Dilution Factor with ISTDs

Sample ISTD Information:

```

ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```


Sample Name: 6E14115-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 5/21/2016 9:46:07 AM        Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed    : 5/20/2016 4:13:17 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:27:47 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.161	BBA	3	8.88799e7	0.00000	0.00000		PERC83

Totals without ISTD(s) : 0.00000

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.102	BBA	3	2.87790e7	0.00000	0.00000		PERC85

Totals without ISTD(s) : 0.00000

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.100		3	-	-	-		PERC89

Totals without ISTD(s) : 0.00000

1 Warnings or Errors :

Warning : ISTD compound(s) not found

*** End of Report ***

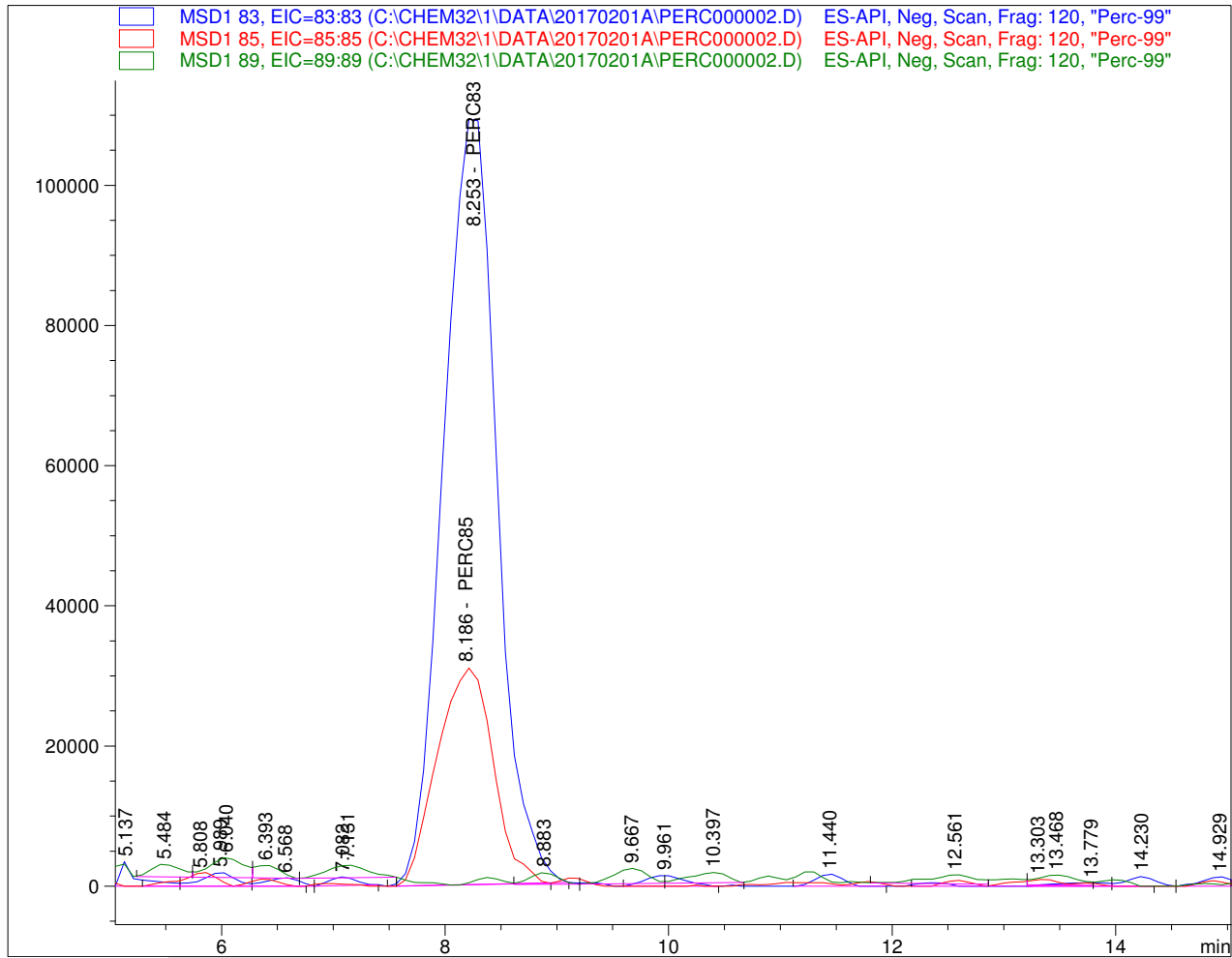
MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Lab File ID: PERC000002.D.Report.TXT Injection Date: 02/01/17
Instrument ID: LCMS1 Injection Time: 14:47
Sequence: 7A03115 Lab Sample ID: 7A03115-TUN1

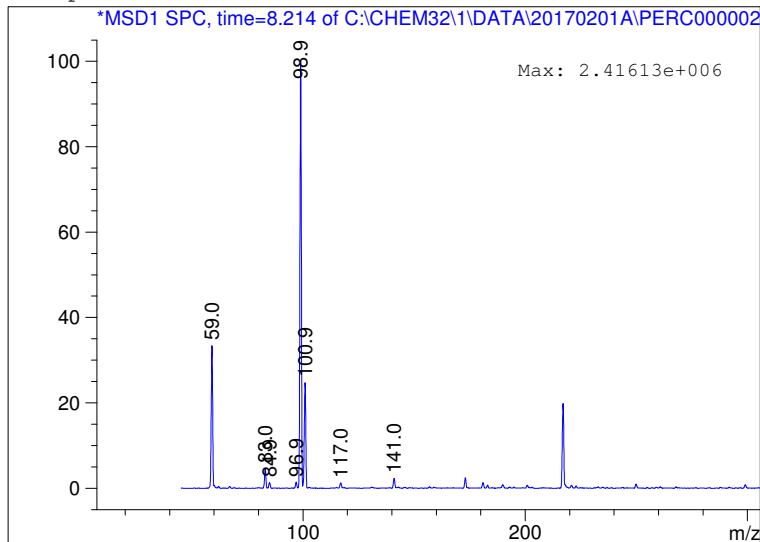
m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

=====
Acq. Operator : Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 2/1/2017 2:47:32 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed : 2/26/2016 12:58:39 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 8:34:51 PM
(modified after loading)

Current Chromatogram(s)



MS Spectrum



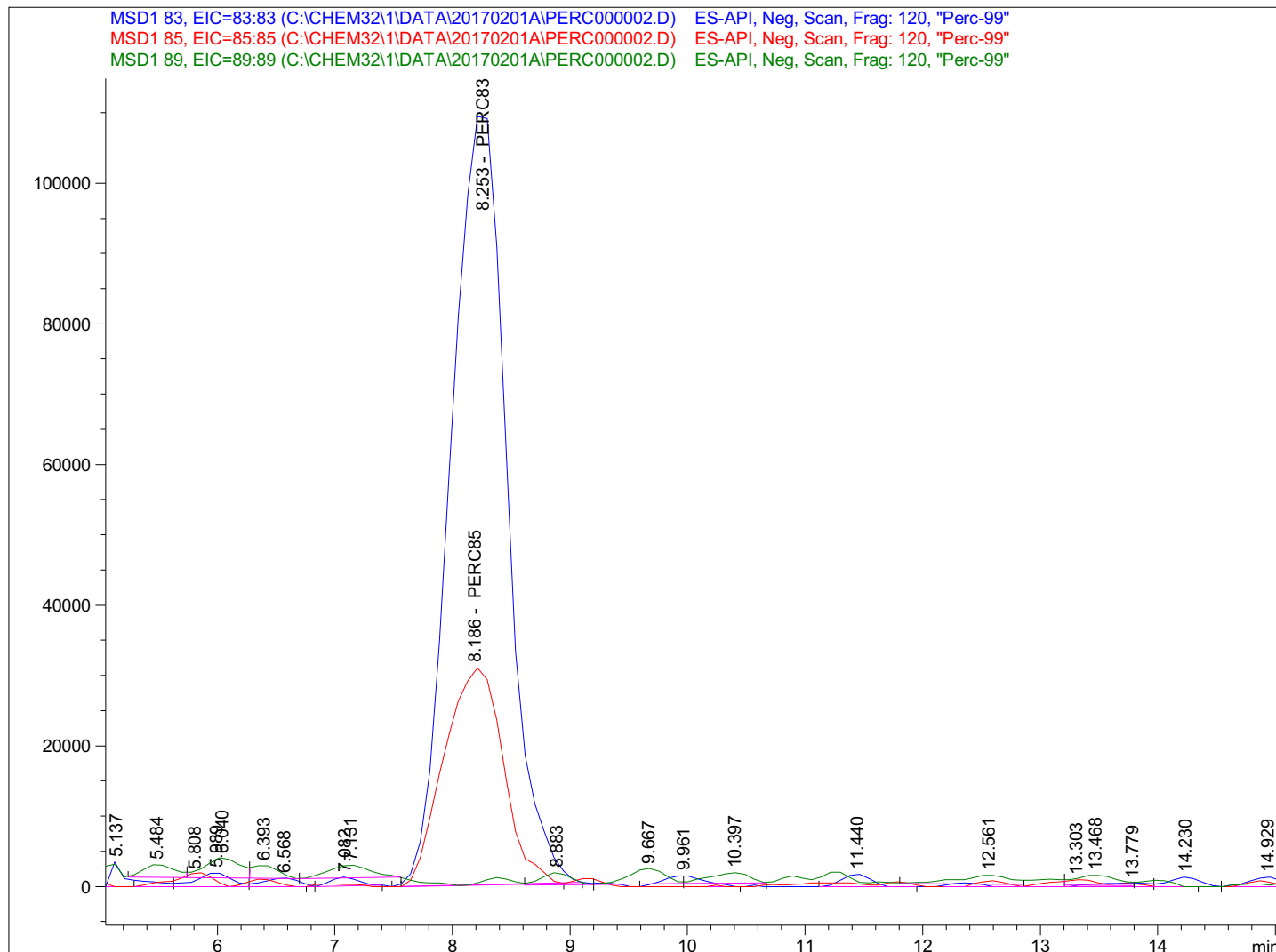
Sample Name: 7A03115-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 2/1/2017 2:47:32 PM          Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed   : 2/26/2016 12:58:39 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/1/2017 8:34:51 PM
                (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : 2/1/2017 8:33:00 PM
Multiplier    : 1.0000
Dilution      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

Sample Name: 7A03115-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 2/1/2017 2:47:32 PM          Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed    : 2/26/2016 12:58:39 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:34:51 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.253	BBA	3	3.61534e6	0.00000	0.00000		PERC83

Totals without ISTD(s) : 0.00000

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.186	BBA	3	1.07896e6	0.00000	0.00000		PERC85

Totals without ISTD(s) : 0.00000

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.200		3	-	-	-		PERC89

Totals without ISTD(s) : 0.00000

1 Warnings or Errors :

Warning : ISTD compound(s) not found

*** End of Report ***

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Lab File ID: PERC000002.D.Report.TXT Injection Date: 02/02/17
Instrument ID: LCMS1 Injection Time: 13:54
Sequence: 7B03207 Lab Sample ID: 7B03207-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

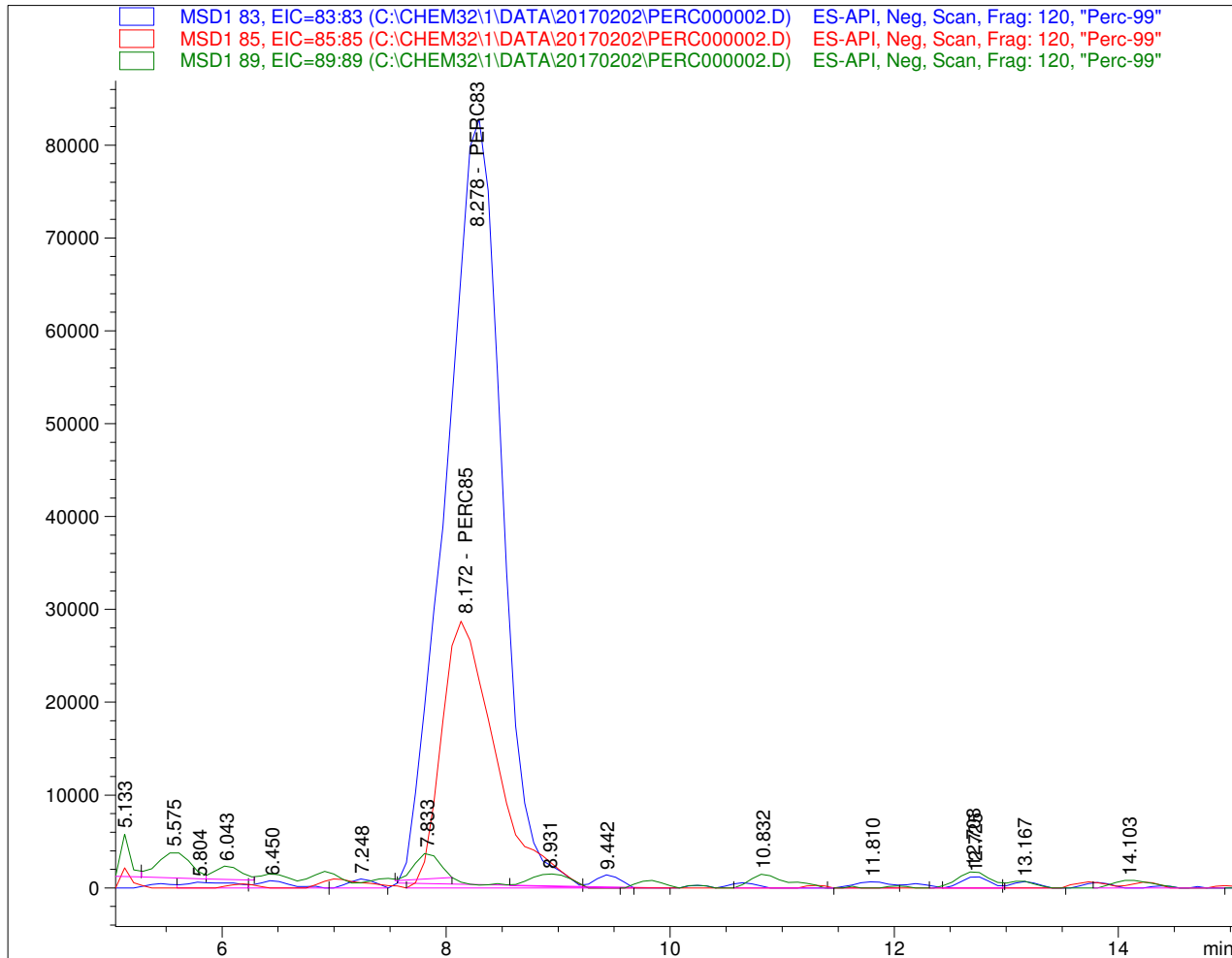
```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                 Location  : Vial 1
Injection Date  : 2/2/2017 1:54:39 PM         Inj       :    1
                                                Inj Volume: 100.0 µl

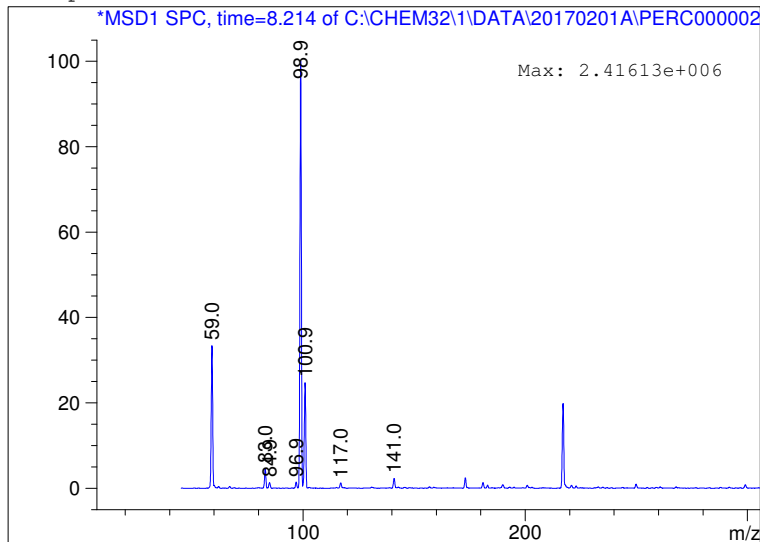
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed    : 2/26/2016 12:58:39 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 2:31:45 PM
                (modified after loading)

```

Current Chromatogram(s)



MS Spectrum



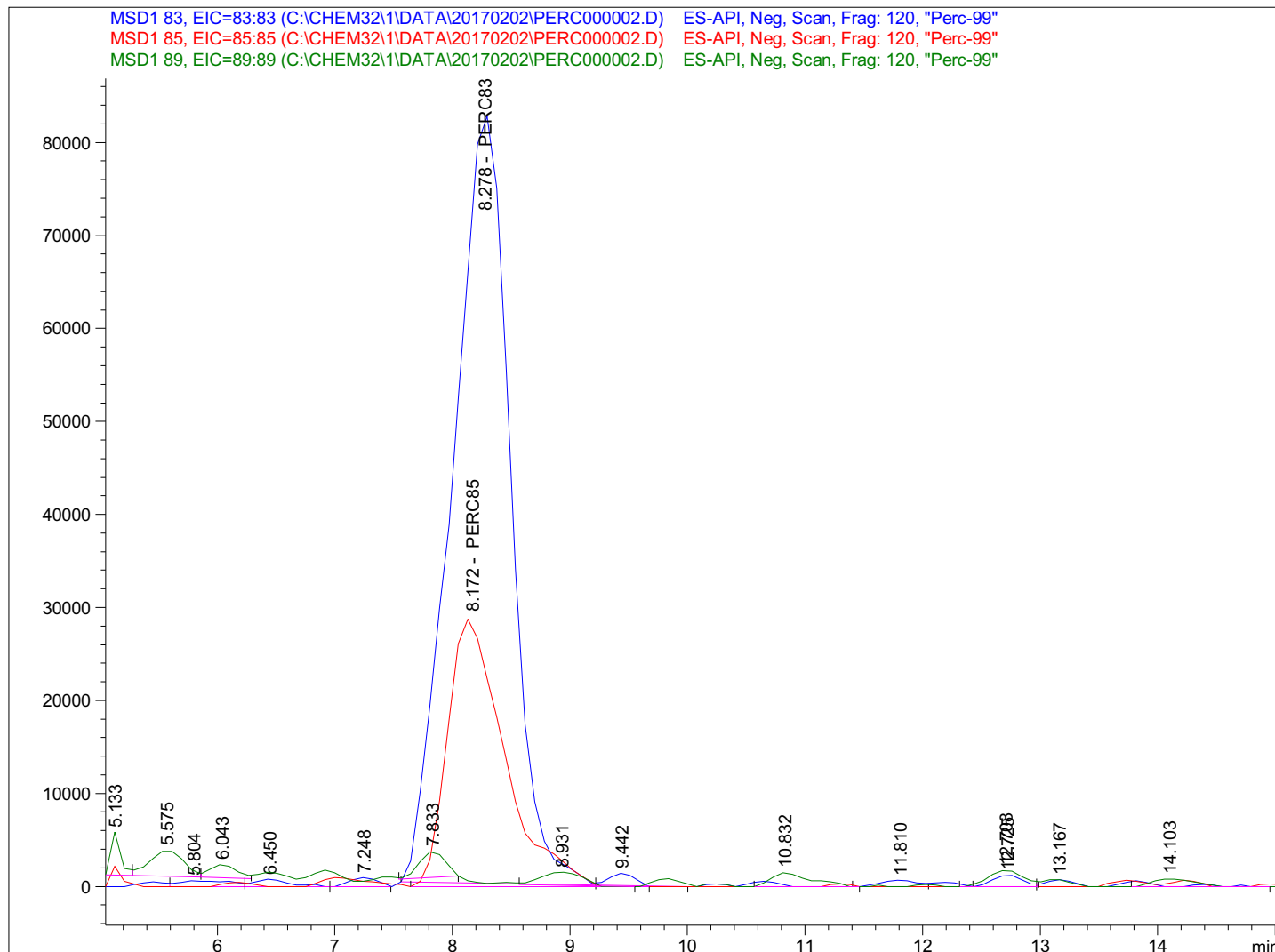
Sample Name: 7A03207-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 2/2/2017 1:54:39 PM          Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed   : 2/26/2016 12:58:39 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/2/2017 2:31:45 PM
                (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By           : Signal
Calib. Data Modified : 2/2/2017 2:31:17 PM
Multiplier          : 1.0000
Dilution            : 1.0000

```

Use Multiplier & Dilution Factor with ISTDs

Sample ISTD Information:

ISTD #	ISTD Amount [ug/l]	ISTD Name

Sample Name: 7A03207-TUN1

```

=====
Acq. Operator   :                               Seq. Line :    2
Acq. Instrument : Instrument 1                   Location  : Vial 1
Injection Date  : 2/2/2017 1:54:39 PM          Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_SC
Last changed    : 2/26/2016 12:58:39 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 2:31:45 PM
                  (modified after loading)
=====

```

```

3      5.00000  PERC89

```

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.278	BV	3	2.82427e6	0.00000	0.00000		PERC83

Totals without ISTD(s) : 0.00000

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.172	BB	3	9.69331e5	0.00000	0.00000		PERC85

Totals without ISTD(s) : 0.00000

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
8.300		3	-	-	-		PERC89

Totals without ISTD(s) : 0.00000

1 Warnings or Errors :

Warning : ISTD compound(s) not found

```

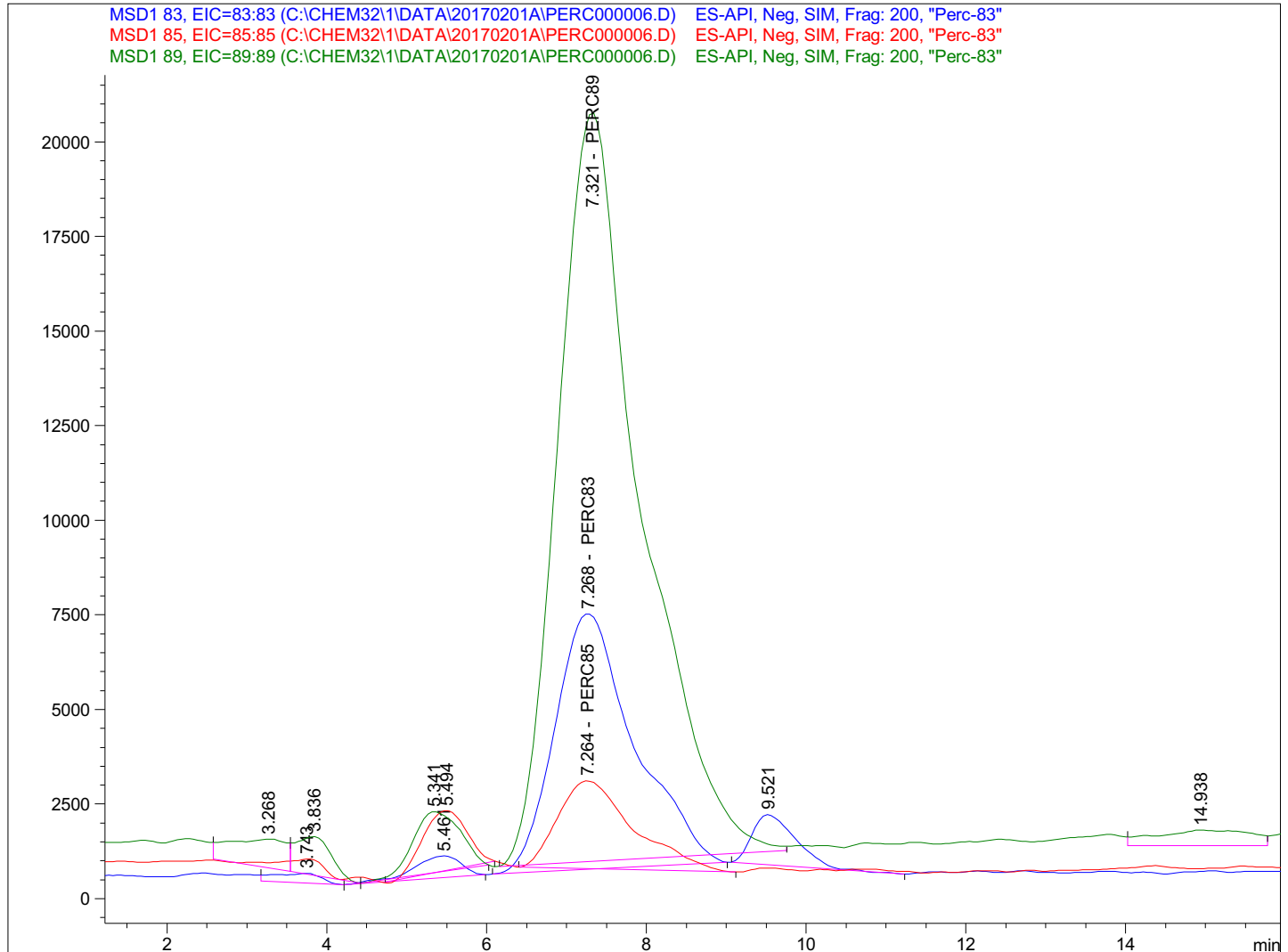
=====
*** End of Report ***

```

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: PerchlorateInstrument ID: LCMS1Calibration: 6144001Sequence: 7A03115

Lab Sample ID	Analyte	True	Found	%R	Units
7A03115-IFA1	Perchlorate-d18	5.000	5.00	49.0	ug/L
	Perchlorate	2.000	1.91	95.5	ug/L

=====
Acq. Operator : Seq. Line : 6
Acq. Instrument : Instrument 1 Location : Vial 5
Injection Date : 2/1/2017 4:02:09 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 8:52:12 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/1/2017 8:49:16 PM
Multiplier : 1.0000
Dilution : 1.0000

Use Multiplier & Dilution Factor with ISTDs

Sample ISTD Information:

ISTD #	ISTD Amount [ug/l]	ISTD Name
--------	--------------------	-----------

```

=====
Acq. Operator   :                               Seq. Line :    6
Acq. Instrument : Instrument 1                   Location  : Vial 5
Injection Date  : 2/1/2017 4:02:09 PM          Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:52:12 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.268	BBA	3	4.66790e5	1.17157	1.90910		PERC83

Totals without ISTD(s) : 1.90910

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.264	BV	3	1.51799e5	3.42345	1.81414		PERC85

Totals without ISTD(s) : 1.81414

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.321	BV I	3	1.43230e6	1.00000	5.00000		PERC89

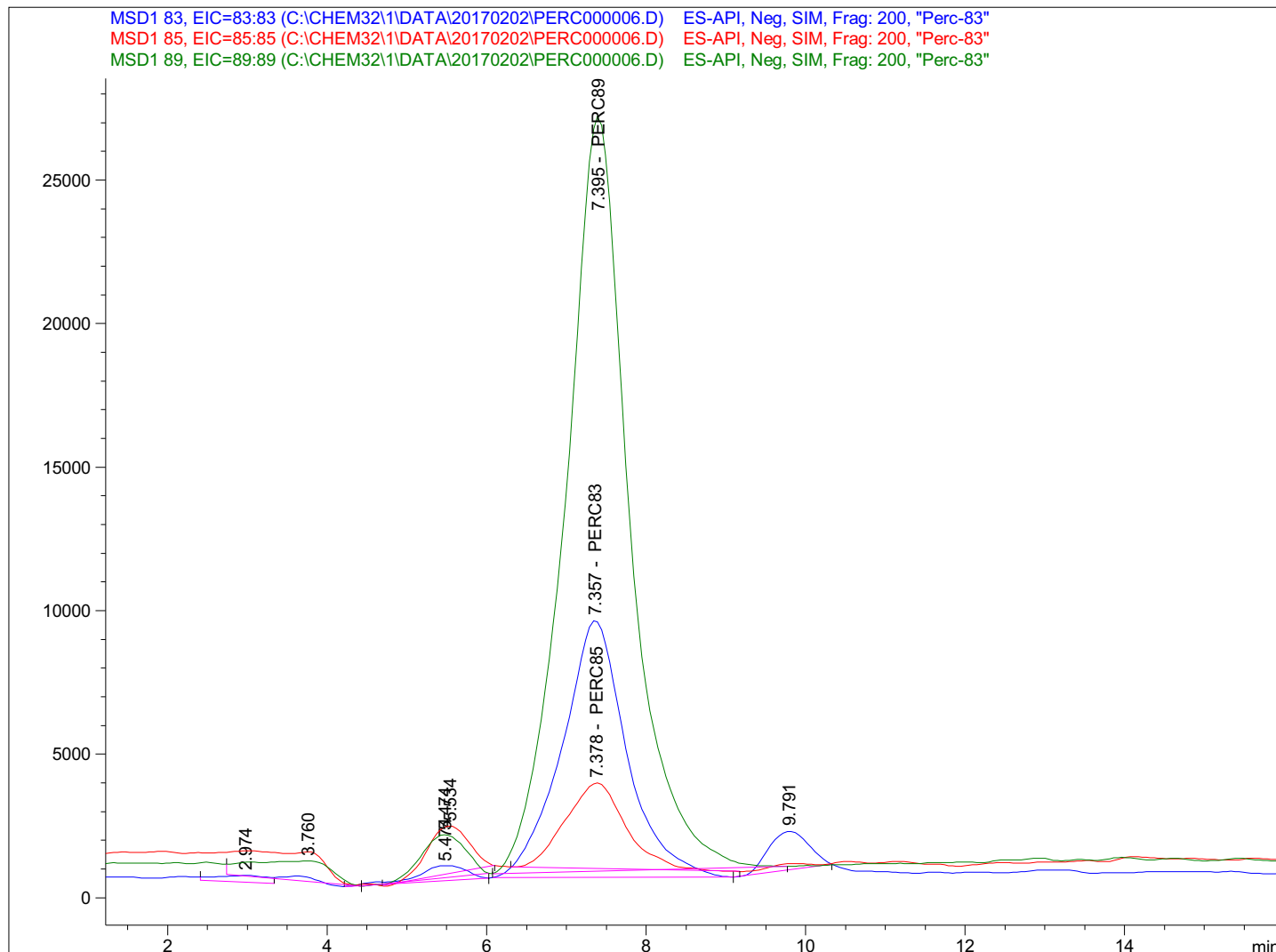
Totals without ISTD(s) : 0.00000

*** End of Report ***

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: PerchlorateInstrument ID: LCMS1Calibration: 6144001Sequence: 7B03207

Lab Sample ID	Analyte	True	Found	%R	Units
7B03207-IFA1	Perchlorate-d18	5.000	5.00	50.9	ug/L
	Perchlorate	2.000	2.03	101	ug/L

=====
Acq. Operator : Seq. Line : 6
Acq. Instrument : Instrument 1 Location : Vial 5
Injection Date : 2/2/2017 3:09:10 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/2/2017 5:46:39 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/2/2017 5:45:54 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
[ug/l]
-----|-----|-----

```

=====
Acq. Operator   :                               Seq. Line :    6
Acq. Instrument : Instrument 1                   Location  : Vial 5
Injection Date  : 2/2/2017 3:09:10 PM        Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 5:46:39 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.357	BV	3	5.05636e5	1.17157	2.02585		PERC83

Totals without ISTD(s) : 2.02585

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.378	BV	3	1.56745e5	3.42345	1.83509		PERC85

Totals without ISTD(s) : 1.83509

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
7.395	BB I	3	1.46208e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

ANALYSIS SEQUENCE SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Sequence: 6E14115 Instrument: LCMS1
Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	6E14115-TUN1	PERC000002.D.Report.TXT	05/21/16 09:46
Cal Standard	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
Cal Standard	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
Cal Standard	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
Cal Standard	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
Cal Standard	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
Cal Standard	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
Cal Standard	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
Cal Standard	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44
Initial Cal Check	6E14115-ICV1	PERC000014.D.Report.TXT	05/21/16 13:20

ANALYSIS SEQUENCE SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1701251
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
Sequence: 7A03115 Instrument: LCMS1
Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	7A03115-TUN1	PERC000002.D.Report.TXT	02/01/17 14:47
Calibration Check	7A03115-CCV1	PERC000004.D.Report.TXT	02/01/17 15:24
Low Cal Check	7A03115-LCV1	PERC000005.D.Report.TXT	02/01/17 15:43
Interference Check A	7A03115-IFA1	PERC000006.D.Report.TXT	02/01/17 16:02
Blank	7A31017-BLK1	PERC000008.D.Report.TXT	02/01/17 16:39
LCS	7A31017-BS1	PERC000009.D.Report.TXT	02/01/17 16:58
Calibration Check	7A03115-CCV2	PERC000017.D.Report.TXT	02/01/17 19:30
Low Cal Check	7A03115-LCV2	PERC000018.D.Report.TXT	02/01/17 19:48

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Sequence:	<u>7A03115</u>	Instrument:	<u>LCMS1</u>
		Calibration:	<u>6144001</u>

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7A03115-CCV1)		Lab File ID: PERC000004.D.Report.TXT			Analyzed: 02/01/17 15:24	
Perchlorate-d18	2921150	9.254	2047316	143	50 - 150	
Low Cal Check (7A03115-LCV1)		Lab File ID: PERC000005.D.Report.TXT			Analyzed: 02/01/17 15:43	
Perchlorate-d18	2894370	9.216	2047316	141	50 - 150	
Interference Check A (7A03115-IFA1)		Lab File ID: PERC000006.D.Report.TXT			Analyzed: 02/01/17 16:02	
Perchlorate-d18	1432300	7.321	2047316	70	50 - 150	
Blank (7A31017-BLK1)		Lab File ID: PERC000008.D.Report.TXT			Analyzed: 02/01/17 16:39	
Perchlorate-d18	2606470	9.304	2047316	127	50 - 150	
LCS (7A31017-BS1)		Lab File ID: PERC000009.D.Report.TXT			Analyzed: 02/01/17 16:58	
Perchlorate-d18	2856820	9.32	2047316	140	50 - 150	
Calibration Check (7A03115-CCV2)		Lab File ID: PERC000017.D.Report.TXT			Analyzed: 02/01/17 19:30	
Perchlorate-d18	2447430	9.171	2047316	120	50 - 150	
Low Cal Check (7A03115-LCV2)		Lab File ID: PERC000018.D.Report.TXT			Analyzed: 02/01/17 19:48	
Perchlorate-d18	2632930	9.22	2047316	129	50 - 150	

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1701251
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Perchlorate
 Sequence: 7B03207 Instrument: LCMS1
 Calibration: 6144001

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7B03207-CCV1)		Lab File ID: PERC000004.D.Report.TXT			Analyzed: 02/02/17 14:31	
Perchlorate-d18	2874130	9.181	2047316	140	50 - 150	
Low Cal Check (7B03207-LCV1)		Lab File ID: PERC000005.D.Report.TXT			Analyzed: 02/02/17 14:50	
Perchlorate-d18	2912800	9.204	2047316	142	50 - 150	
Interference Check A (7B03207-IFA1)		Lab File ID: PERC000006.D.Report.TXT			Analyzed: 02/02/17 15:09	
Perchlorate-d18	1462080	7.395	2047316	71	50 - 150	
LH18/24-SP650-6416-Grab (1701251-01)		Lab File ID: PERC000008.D.Report.TXT			Analyzed: 02/02/17 15:46	
Perchlorate-d18	2831210	8.846	2047316	138	50 - 150	
Calibration Check (7B03207-CCV2)		Lab File ID: PERC000024.D.Report.TXT			Analyzed: 02/02/17 21:15	
Perchlorate-d18	2445510	9.114	2047316	119	50 - 150	
Low Cal Check (7B03207-LCV2)		Lab File ID: PERC000025.D.Report.TXT			Analyzed: 02/02/17 21:34	
Perchlorate-d18	2674700	9.251	2047316	131	50 - 150	

INITIAL CALIBRATION DATA
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: PerchlorateCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:39 5/21/16 12:44

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	0.2	0.7845944	0.5	0.7849415	1	0.783103	2	0.8192946	5	0.8473028	10	0.8833049
Perchlorate (101)	0.2		0.5		1		2		5		10	
Perchlorate (85)	0.2	0.334203	0.5	0.290602	1	0.275233	2	0.2750875	5	0.2714884	10	0.2777807

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: PerchlorateCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	20	0.928708	50	0.9971742								
Perchlorate (101)	20		50									
Perchlorate (85)	20	0.2935408	50	0.3188878								

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: PerchlorateCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Perchlorate	0.8535529	9.160918	9.7105	0.164666			20	
Perchlorate (101)							20	
Perchlorate (85)	0.2921029	7.869005	9.72	0.2060657			20	

INITIAL CALIBRATION STANDARDS

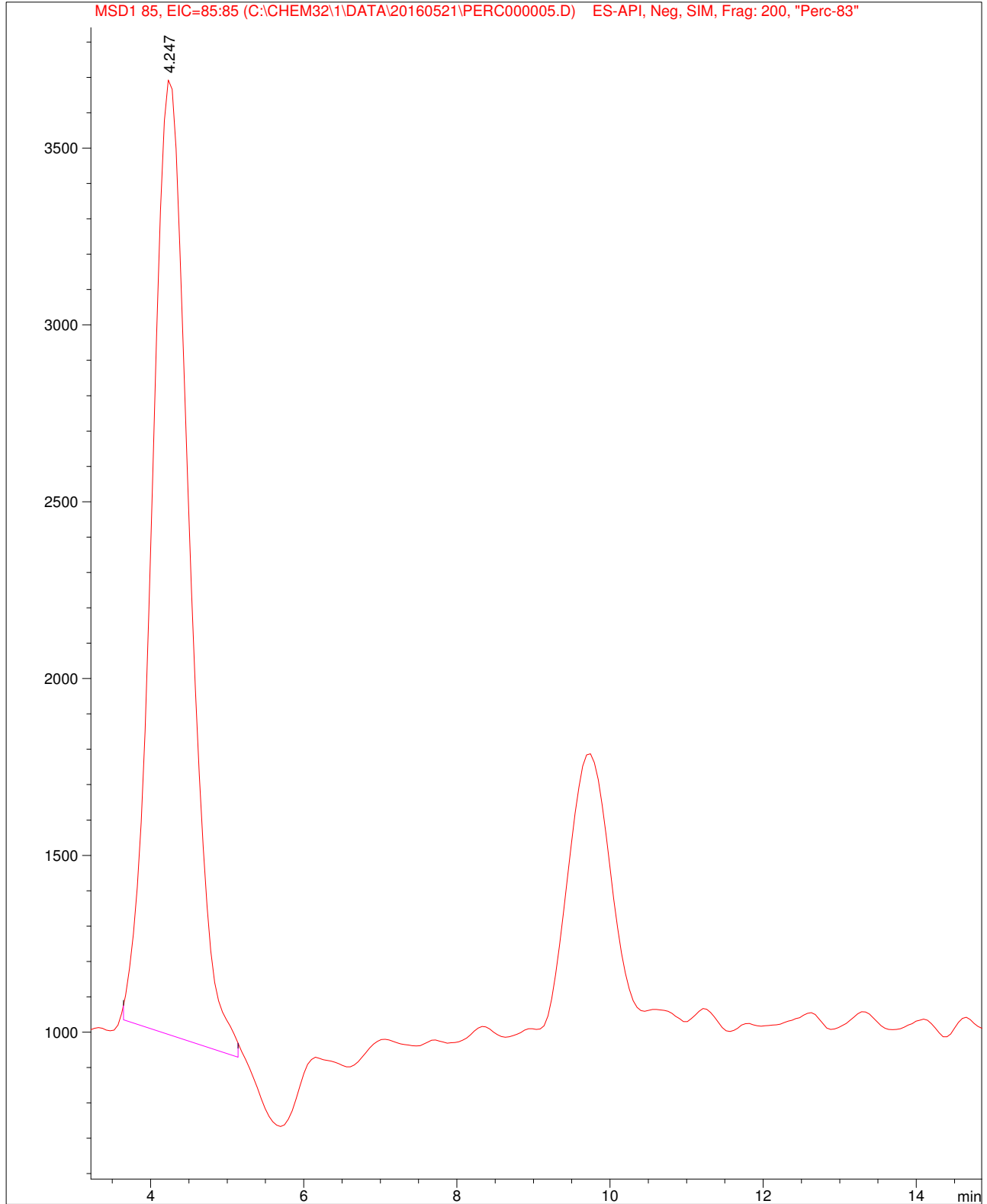
SW6850

Laboratory:	Empirical Laboratories, LLC	SDG:	1701251
Client:	Microbac Laboratories, Inc.-Ohio Valley Division	Project:	Perchlorate
Sequence:	6E14115	Instrument:	LCMS1
Calibration:	6144001		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
16D0528	Perchlorate Init Cal 0.2 ug/L	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
16D0529	Perchlorate Init Cal 0.5 ug/L	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
16D0530	Perchlorate Init Cal 1.0 ug/L	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
16D0531	Perchlorate Init Cal 2.0 ug/L	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
16D0532	Perchlorate Init Cal 5.0 ug/L	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
16D0533	Perchlorate Init Cal 10 ug/L	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
16D0534	Perchlorate Init Cal 20 ug/L	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
16D0536	Perchlorate Init Cal 50 ug/L	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44

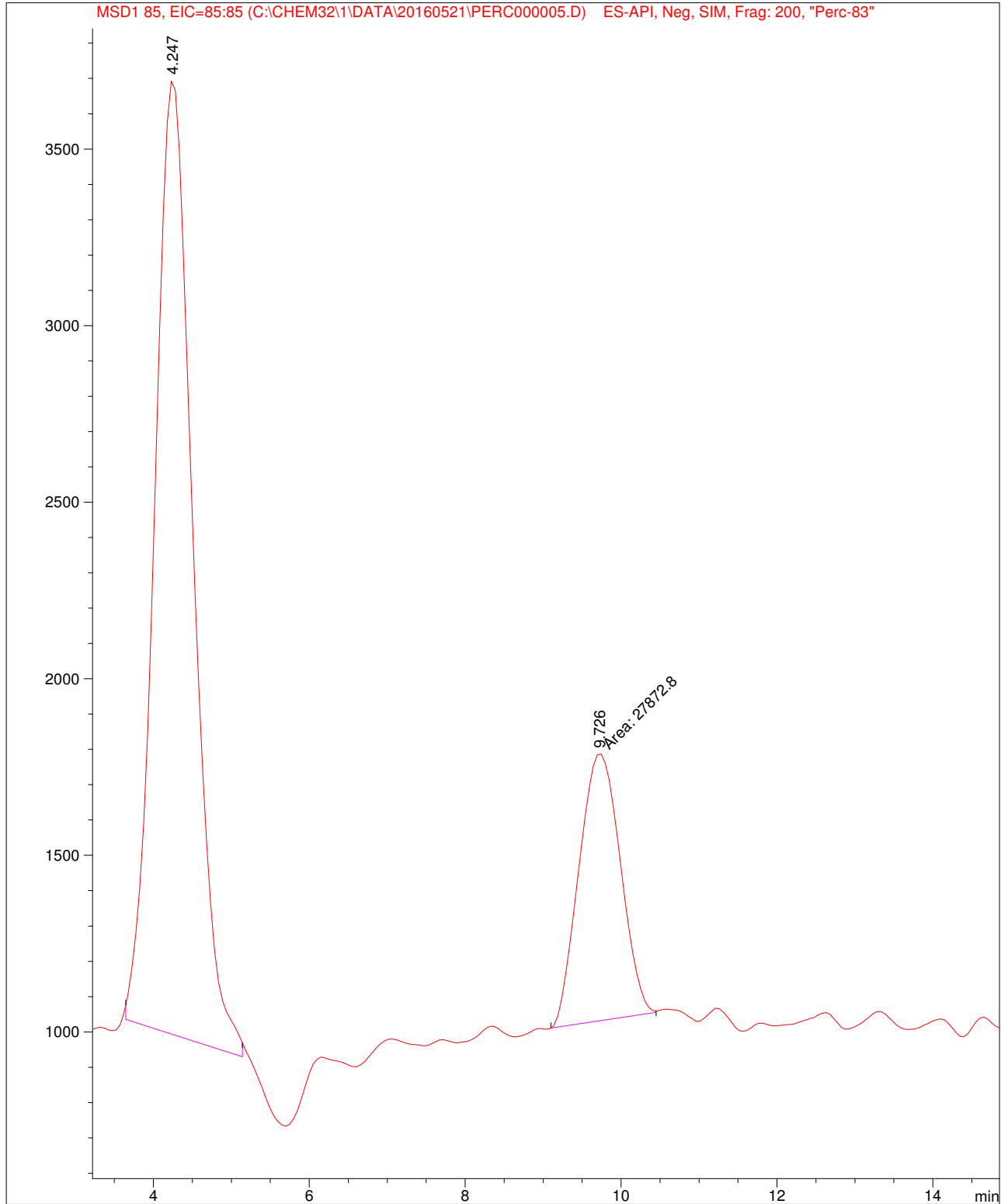
=====
Acq. Operator : Seq. Line : 5
Acq. Instrument : Instrument 1 Location : Vial 91
Injection Date : 5/21/2016 10:39:50 AM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed : 5/23/2016 5:30:00 PM
(modified after loading)

Current Chromatogram(s)



=====
Acq. Operator : Seq. Line : 5
Acq. Instrument : Instrument 1 Location : Vial 91
Injection Date : 5/21/2016 10:39:50 AM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed : 5/23/2016 5:30:00 PM
(modified after loading)
Additional Info : Peak(s) manually integrated

Current Chromatogram(s)



5/23/2016

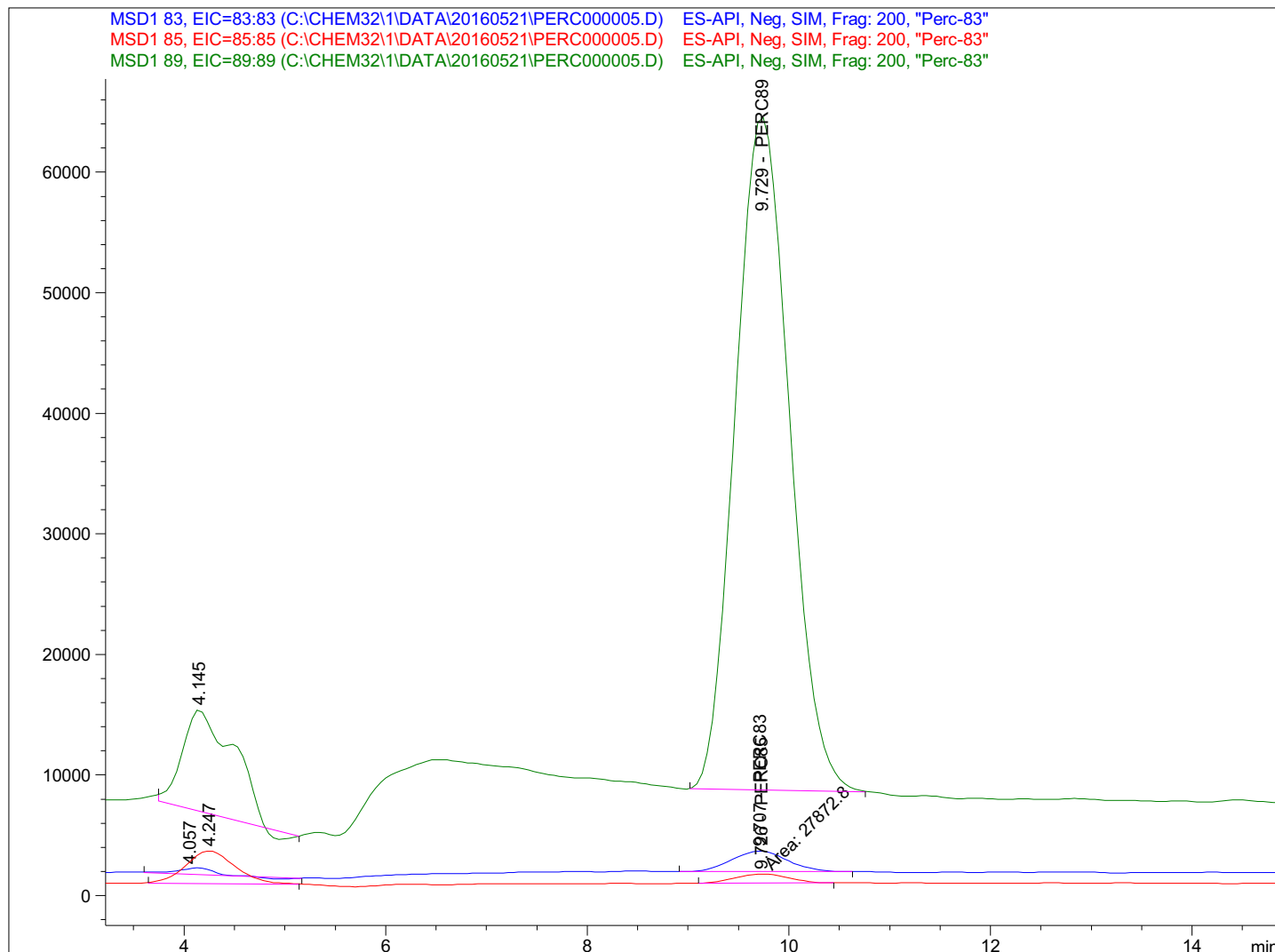
```

=====
Acq. Operator   :                               Seq. Line :    5
Acq. Instrument : Instrument 1                   Location  : Vial 91
Injection Date  : 5/21/2016 10:39:50 AM       Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:34:57 PM
                  (modified after loading)

Additional Info : Peak(s) manually integrated
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By           : Signal
Calib. Data Modified : Monday, May 23, 2016 5:34:56 PM
Multiplier          : 1.0000
Dilution            : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]

```

Sample Name: 6E14115-CAL1

Elisha Richard 00841765

Richard 5/23/2016

```

=====
Acq. Operator   :                               Seq. Line :    5
Acq. Instrument : Instrument 1                     Location  : Vial 91
Injection Date  : 5/21/2016 10:39:50 AM      Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed   : 5/23/2016 5:34:57 PM
                (modified after loading)
Additional Info : Peak(s) manually integrated
=====

```

```

-----|-----|-----
3      5.00000  PERC89

```

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.707	BBA	3	6.54358e4	1.12204	1.76069e-1		PERC83

Totals without ISTD(s) : 1.76069e-1

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.726	MM	3	2.78728e4	3.27940	2.19197e-1		PERC85

Totals without ISTD(s) : 2.19197e-1

Signal 3: MSD1 89, EIC=89:89

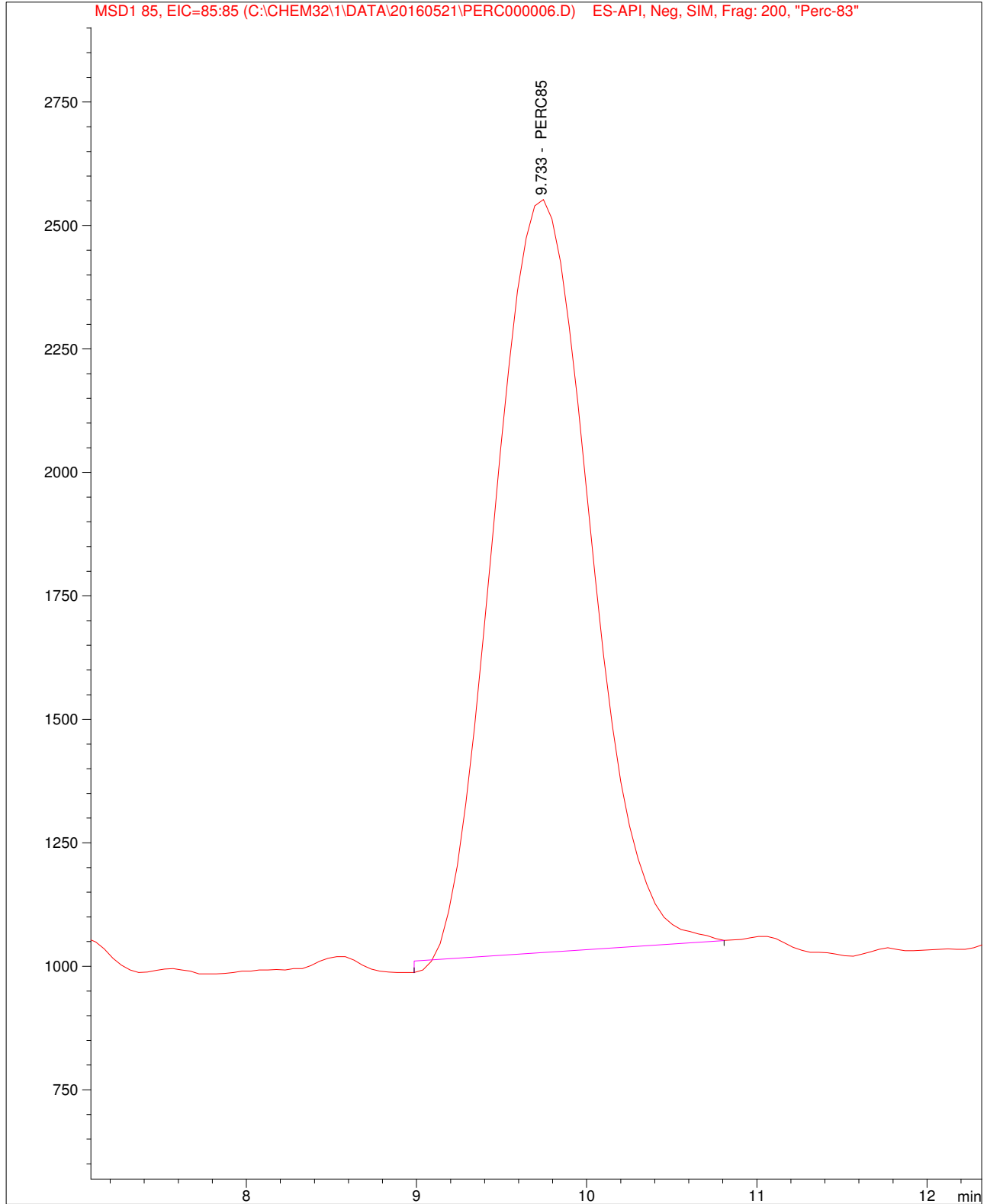
RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.729	BB I	3	2.08502e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

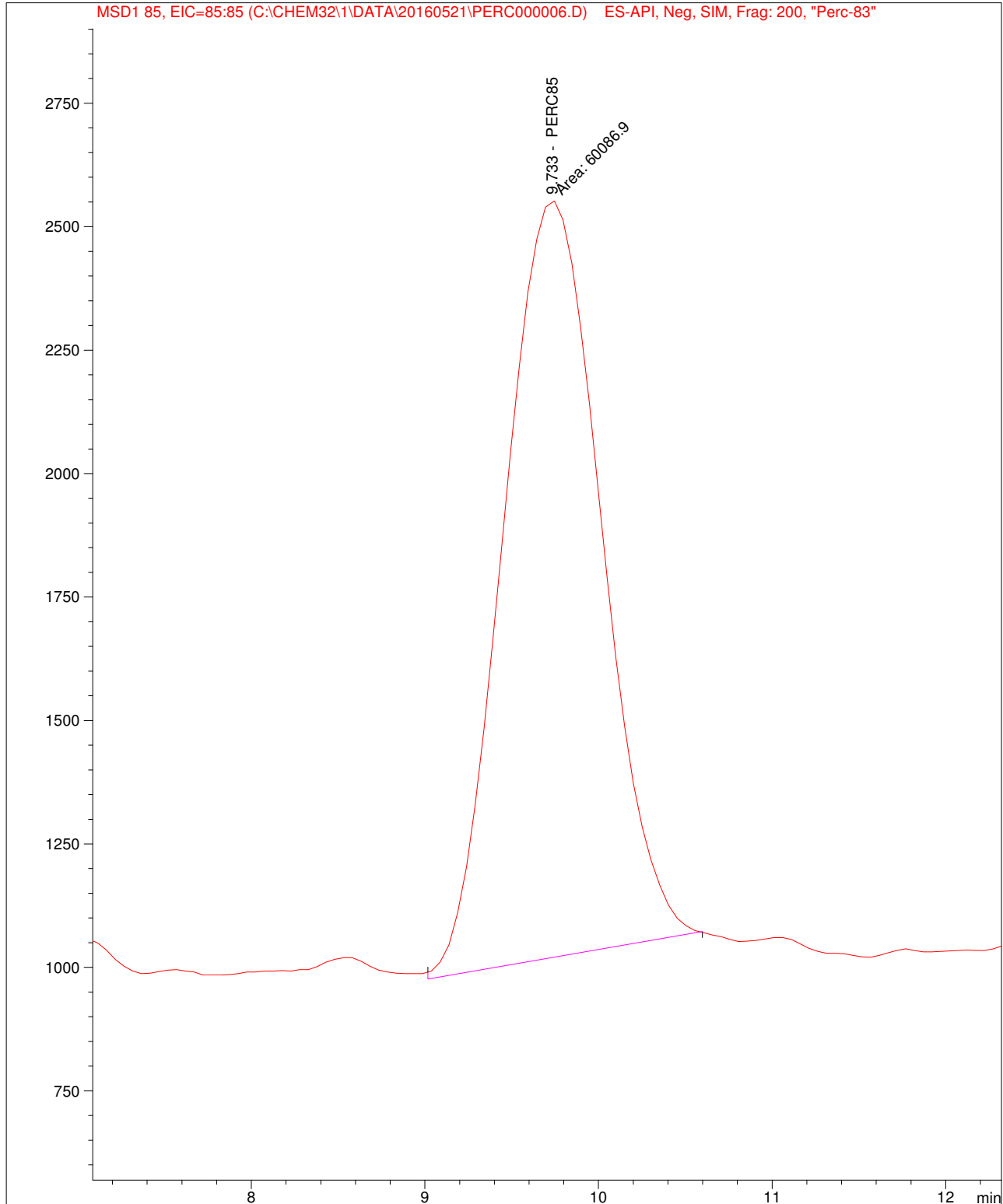
=====
Acq. Operator : Seq. Line : 6
Acq. Instrument : Instrument 1 Location : Vial 92
Injection Date : 5/21/2016 10:57:30 AM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed : 5/23/2016 5:37:02 PM
(modified after loading)

Current Chromatogram(s)



=====
Acq. Operator : Seq. Line : 6
Acq. Instrument : Instrument 1 Location : Vial 92
Injection Date : 5/21/2016 10:57:30 AM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed : 5/23/2016 5:37:02 PM
(modified after loading)
Additional Info : Peak(s) manually integrated

Current Chromatogram(s)

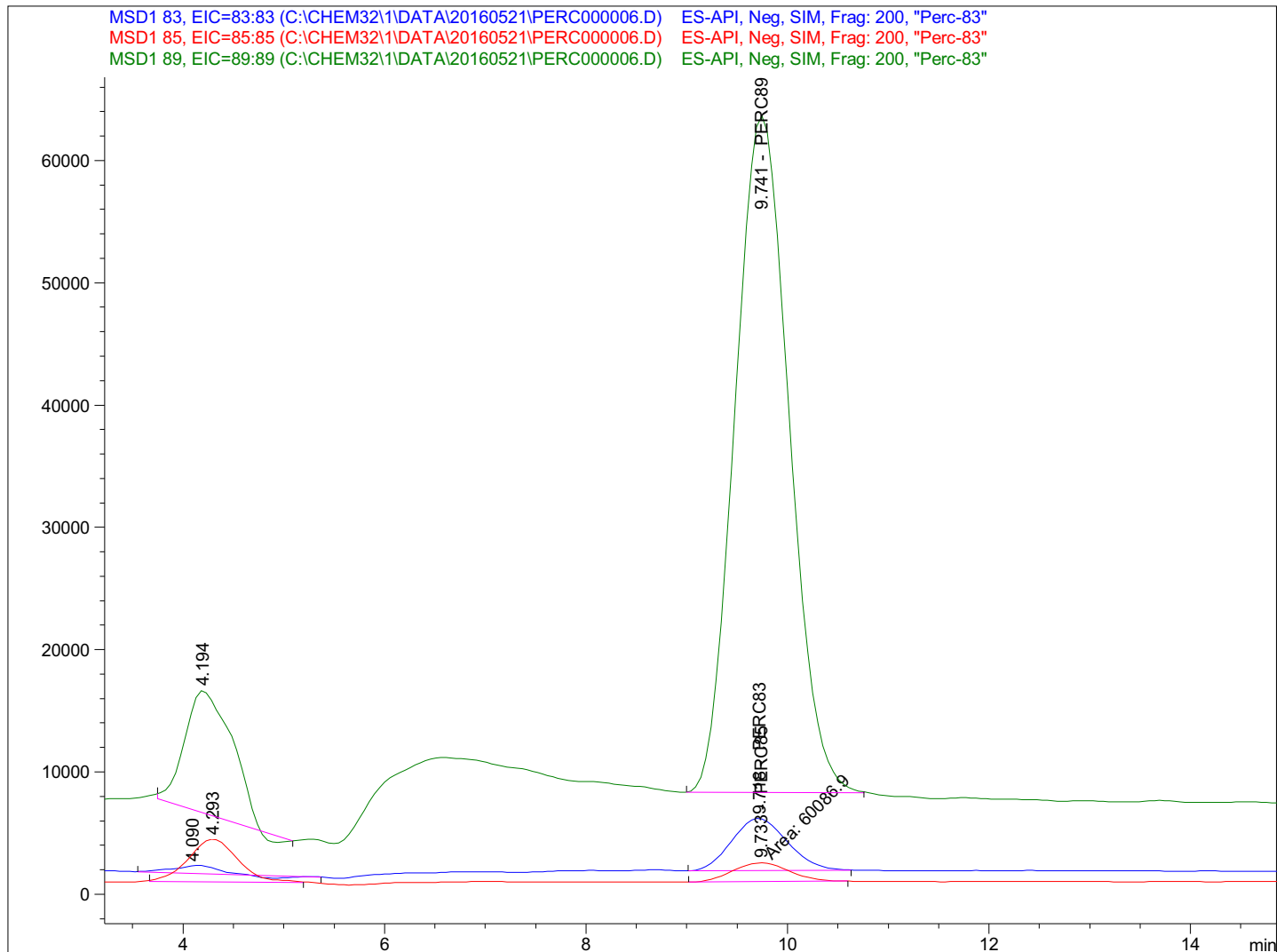


```

=====
Acq. Operator   :                               Seq. Line :    6
Acq. Instrument : Instrument 1                  Location  : Vial 92
Injection Date  : 5/21/2016 10:57:30 AM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:38:08 PM
                  (modified after loading)

Additional Info  : Peak(s) manually integrated
=====
    
```



Internal Standard Report

```

=====
Sorted By      : Signal
Calib. Data Modified : Monday, May 23, 2016 5:38:08 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
    
```

Elisha Richard
Richard

```

=====
Acq. Operator   :                               Seq. Line :    6
Acq. Instrument : Instrument 1                   Location  : Vial 92
Injection Date  : 5/21/2016 10:57:30 AM      Inj       :    1
                                           Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed   : 5/23/2016 5:38:08 PM
                (modified after loading)

Additional Info : Peak(s) manually integrated
=====

```

```

-----|-----|-----
3      5.00000  PERC89

```

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.718	BBA	3	1.62300e5	1.12479	4.41447e-1		PERC83

Totals without ISTD(s) : 4.41447e-1

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.733	MM	3	6.00869e4	3.30347	4.79998e-1		PERC85

Totals without ISTD(s) : 4.79998e-1

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.741	BB I	3	2.06767e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

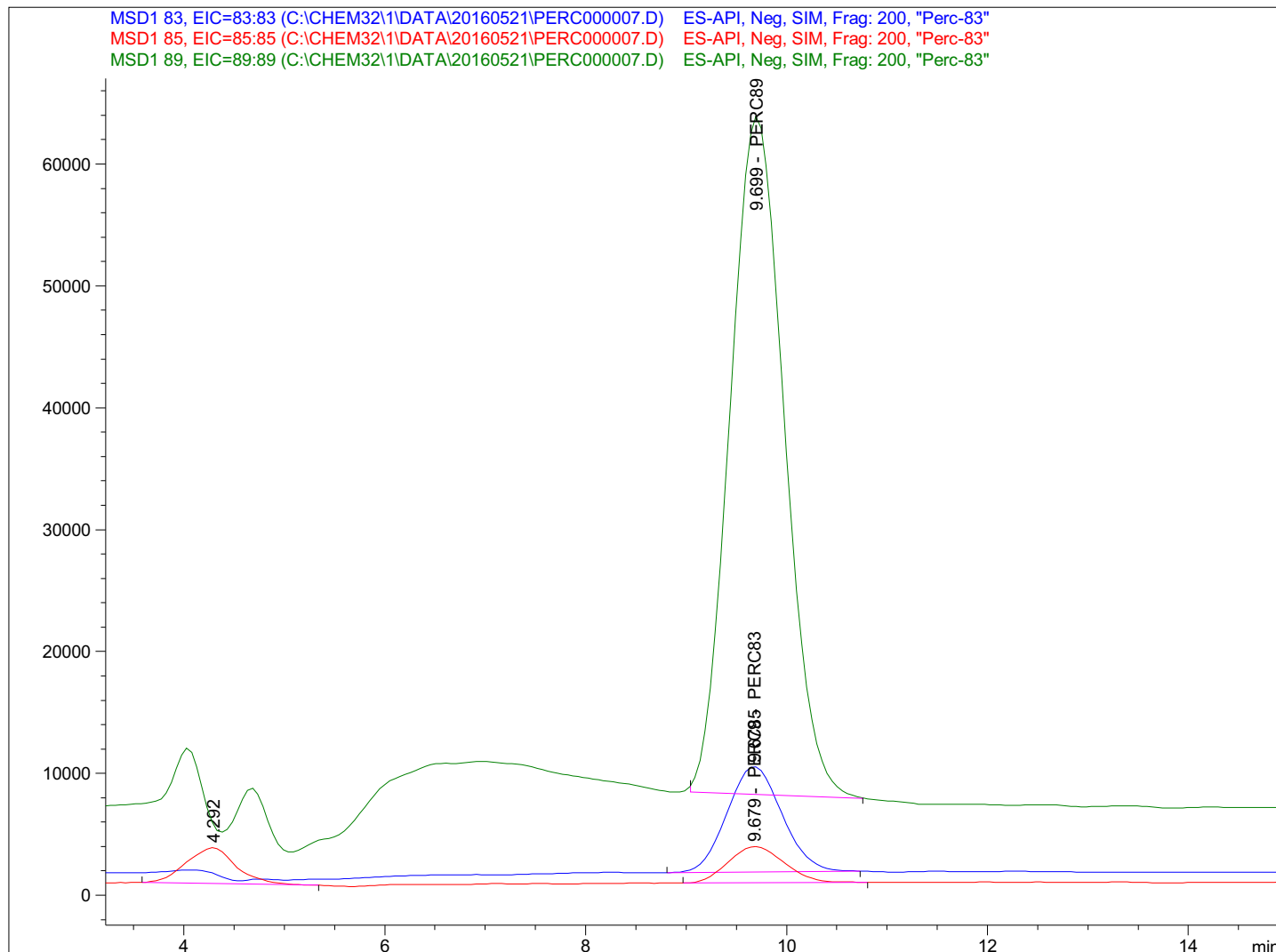
*** End of Report ***


```

=====
Acq. Operator   :                               Seq. Line :    7
Acq. Instrument : Instrument 1                   Location  : Vial 93
Injection Date  : 5/21/2016 11:15:16 AM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:40:58 PM
                  (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : Monday, May 23, 2016 5:40:58 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    7
Acq. Instrument : Instrument 1                   Location  : Vial 93
Injection Date  : 5/21/2016 11:15:16 AM      Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:40:58 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.679	BBA	3	3.27868e5	1.13088	8.85600e-1		PERC83

Totals without ISTD(s) : 8.85600e-1

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.679	BBA	3	1.15234e5	3.31246	9.11695e-1		PERC85

Totals without ISTD(s) : 9.11695e-1

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.699	BB I	3	2.09339e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

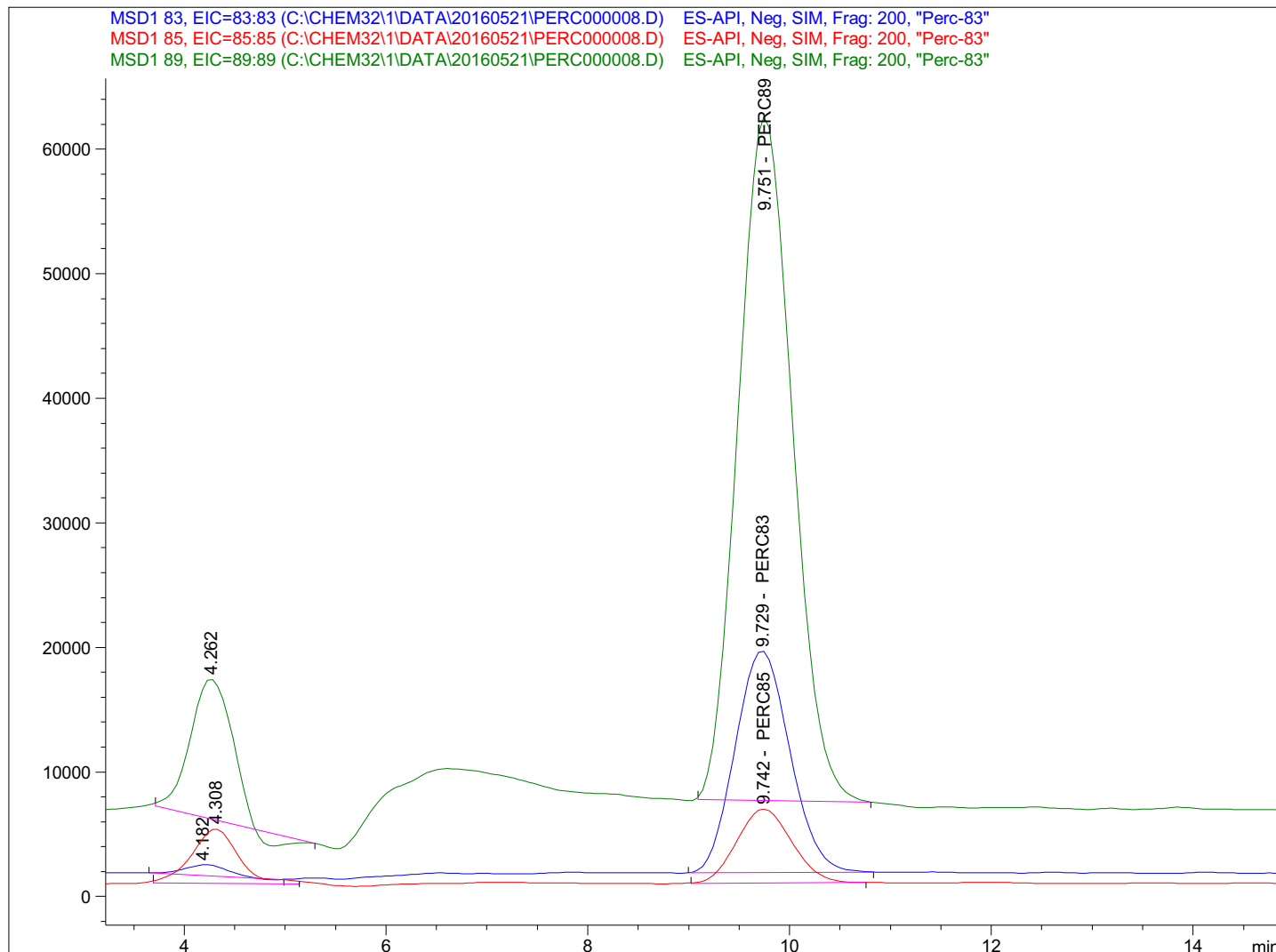
*** End of Report ***

```

=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                   Location  : Vial 94
Injection Date  : 5/21/2016 11:33:07 AM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed   : 5/23/2016 5:43:00 PM
                (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : Monday, May 23, 2016 5:43:00 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    8
Acq. Instrument : Instrument 1                   Location  : Vial 94
Injection Date  : 5/21/2016 11:33:07 AM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:43:00 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.729	BBA	3	6.70491e5	1.13688	1.86287		PERC83

Totals without ISTD(s) : 1.86287

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.742	BB	3	2.25125e5	3.33197	1.83316		PERC85

Totals without ISTD(s) : 1.83316

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.751	BBA I	3	2.04594e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

Sample Name: 6E14115-CAL5

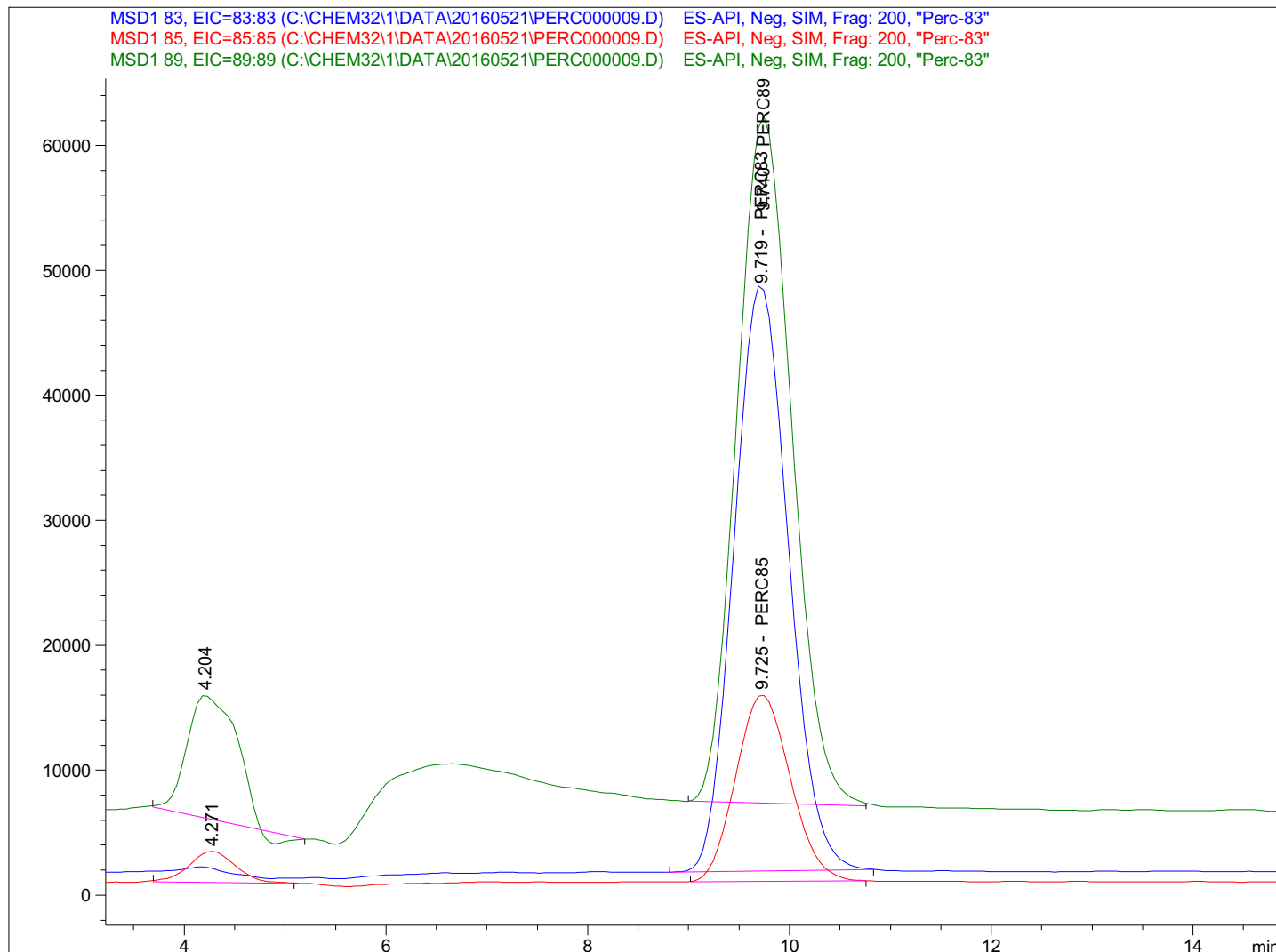
Elisha Richard 00841774

Richard 5/23/2016

```

=====
Acq. Operator   :                               Seq. Line :    9
Acq. Instrument : Instrument 1                  Location  : Vial 95
Injection Date  : 5/21/2016 11:50:56 AM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:44:51 PM
                  (modified after loading)
=====
    
```



Internal Standard Report

```

Sorted By           : Signal
Calib. Data Modified : Monday, May 23, 2016 5:44:51 PM
Multiplier          : 1.0000
Dilution            : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----
    
```

[Signature] 5/23/2016

```

=====
Acq. Operator   :                               Seq. Line :    9
Acq. Instrument : Instrument 1                 Location  : Vial 95
Injection Date  : 5/21/2016 11:50:56 AM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:44:51 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.719	BBA	3	1.75573e6	1.14662	4.85767		PERC83

Totals without ISTD(s) : 4.85767

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.725	BB	3	5.62562e5	3.35778	4.55799		PERC85

Totals without ISTD(s) : 4.55799

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.740	BB I	3	2.07214e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

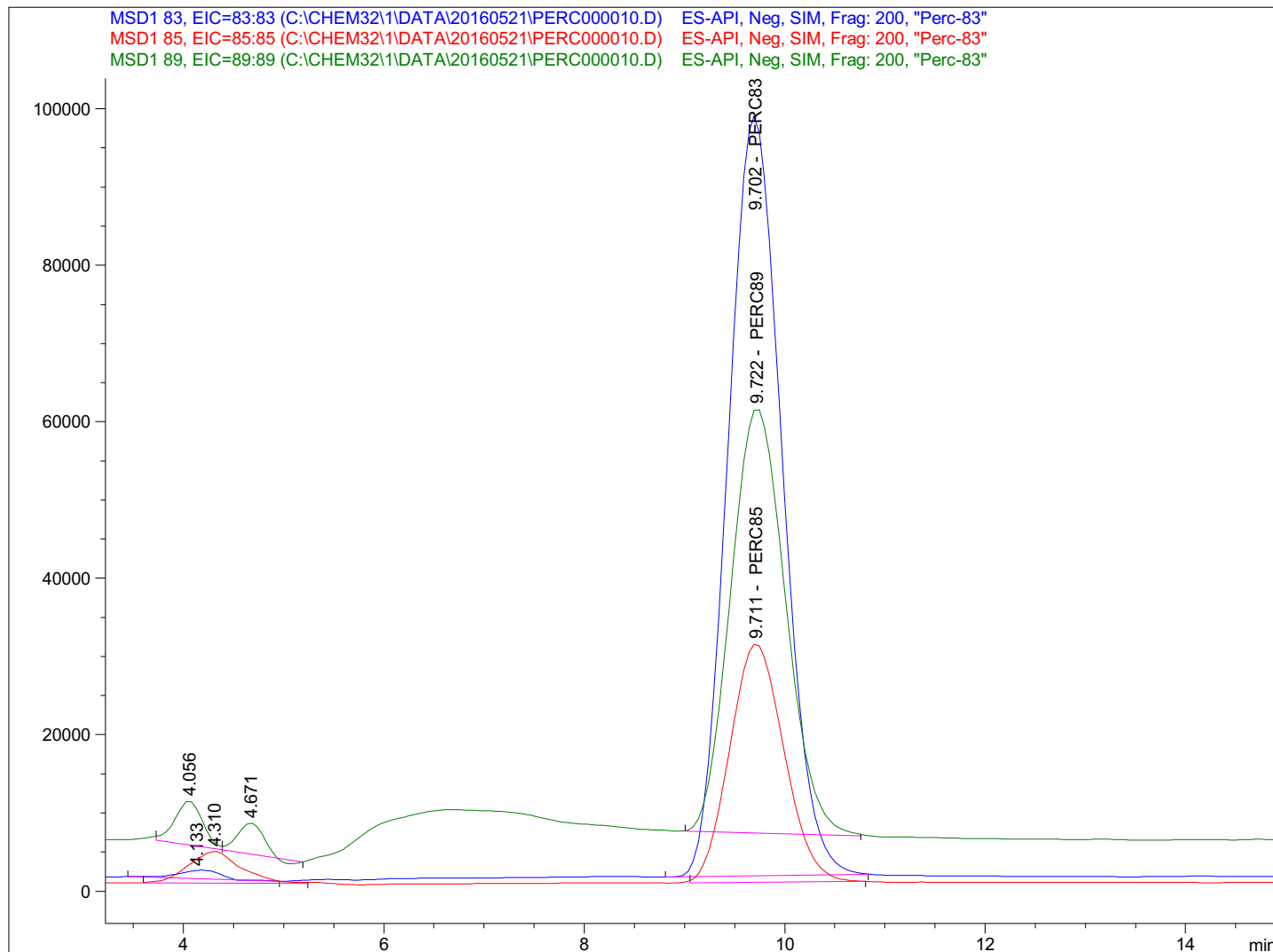
*** End of Report ***

```

=====
Acq. Operator   :                               Seq. Line :   10
Acq. Instrument : Instrument 1                 Location  : Vial 96
Injection Date  : 5/21/2016 12:08:44 PM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:47:31 PM
                  (modified after loading)
=====

```



Internal Standard Report

```

=====
Sorted By      : Signal
Calib. Data Modified : Monday, May 23, 2016 5:47:30 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :   10
Acq. Instrument : Instrument 1                   Location  : Vial 96
Injection Date  : 5/21/2016 12:08:44 PM        Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:47:31 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.702	BBA	3	3.64600e6	1.15625	10.21321		PERC83

Totals without ISTD(s) : 10.21321

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.711	BBA	3	1.14659e6	3.38338	9.39835		PERC85

Totals without ISTD(s) : 9.39835

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.722	BB I	3	2.06384e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

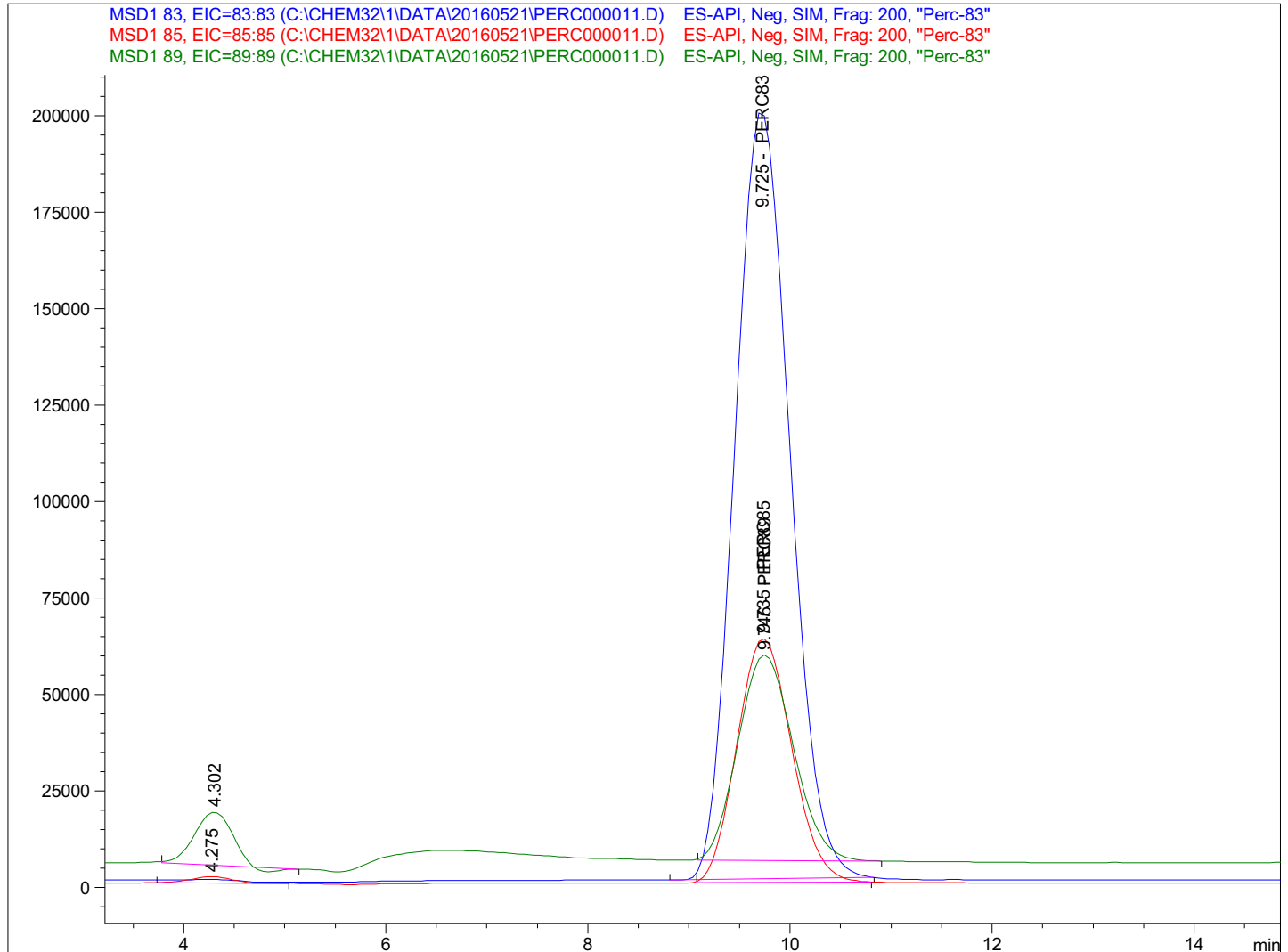
*** End of Report ***


```

=====
Acq. Operator   :                               Seq. Line :   11
Acq. Instrument : Instrument 1                   Location  : Vial 97
Injection Date  : 5/21/2016 12:26:37 PM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:49:45 PM
                  (modified after loading)
=====

```



Internal Standard Report

```

=====
Sorted By      :      Signal
Calib. Data Modified :      Monday, May 23, 2016 5:49:45 PM
Multiplier    :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :   11
Acq. Instrument : Instrument 1                   Location  : Vial 97
Injection Date  : 5/21/2016 12:26:37 PM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed   : 5/23/2016 5:49:45 PM
                (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.725	BBA	3	7.55047e6	1.16467	21.63270		PERC83

Totals without ISTD(s) : 21.63270

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.735	BBA	3	2.38651e6	3.40504	19.99040		PERC85

Totals without ISTD(s) : 19.99040

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.746	BBA	I 3	2.03252e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

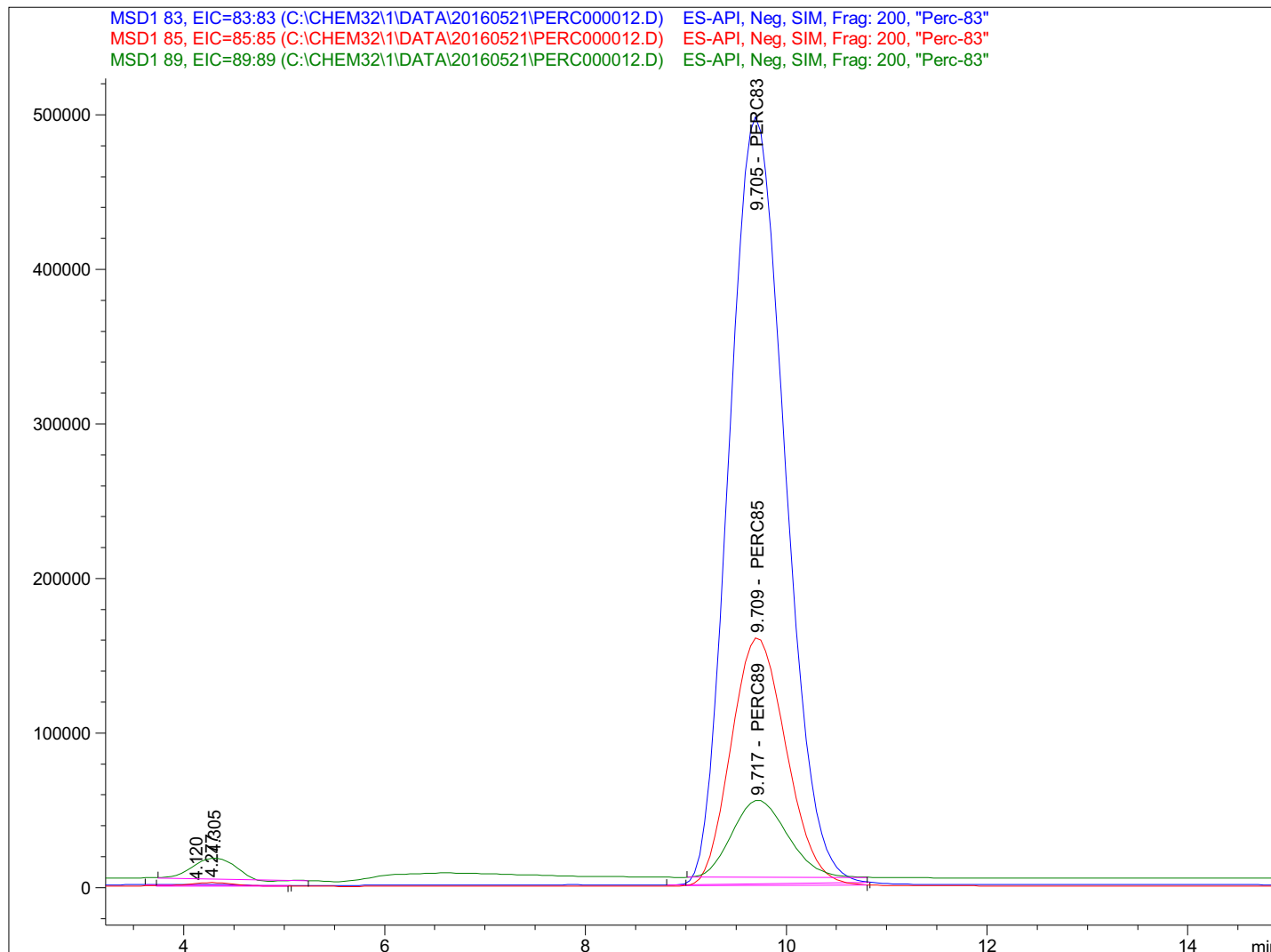
Elisha Richard
Richard

```

=====
Acq. Operator   :                               Seq. Line :   12
Acq. Instrument : Instrument 1                   Location  : Vial 98
Injection Date  : 5/21/2016 12:44:24 PM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed    : 5/23/2016 5:51:24 PM
                  (modified after loading)
=====

```



Internal Standard Report

```

=====
Sorted By      : Signal
Calib. Data Modified : Monday, May 23, 2016 5:51:24 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :   12
Acq. Instrument : Instrument 1                 Location  : Vial 98
Injection Date  : 5/21/2016 12:44:24 PM      Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_042516CAL_83.M
Last changed   : 5/23/2016 5:51:24 PM
                (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.705	BBA	3	1.91259e7	1.17157	58.41308		PERC83

Totals without ISTD(s) : 58.41308

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.709	BBA	3	6.11630e6	3.42345	54.58495		PERC85

Totals without ISTD(s) : 54.58495

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.717	BB I	3	1.91801e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

INITIAL CALIBRATION CHECK

SW6850

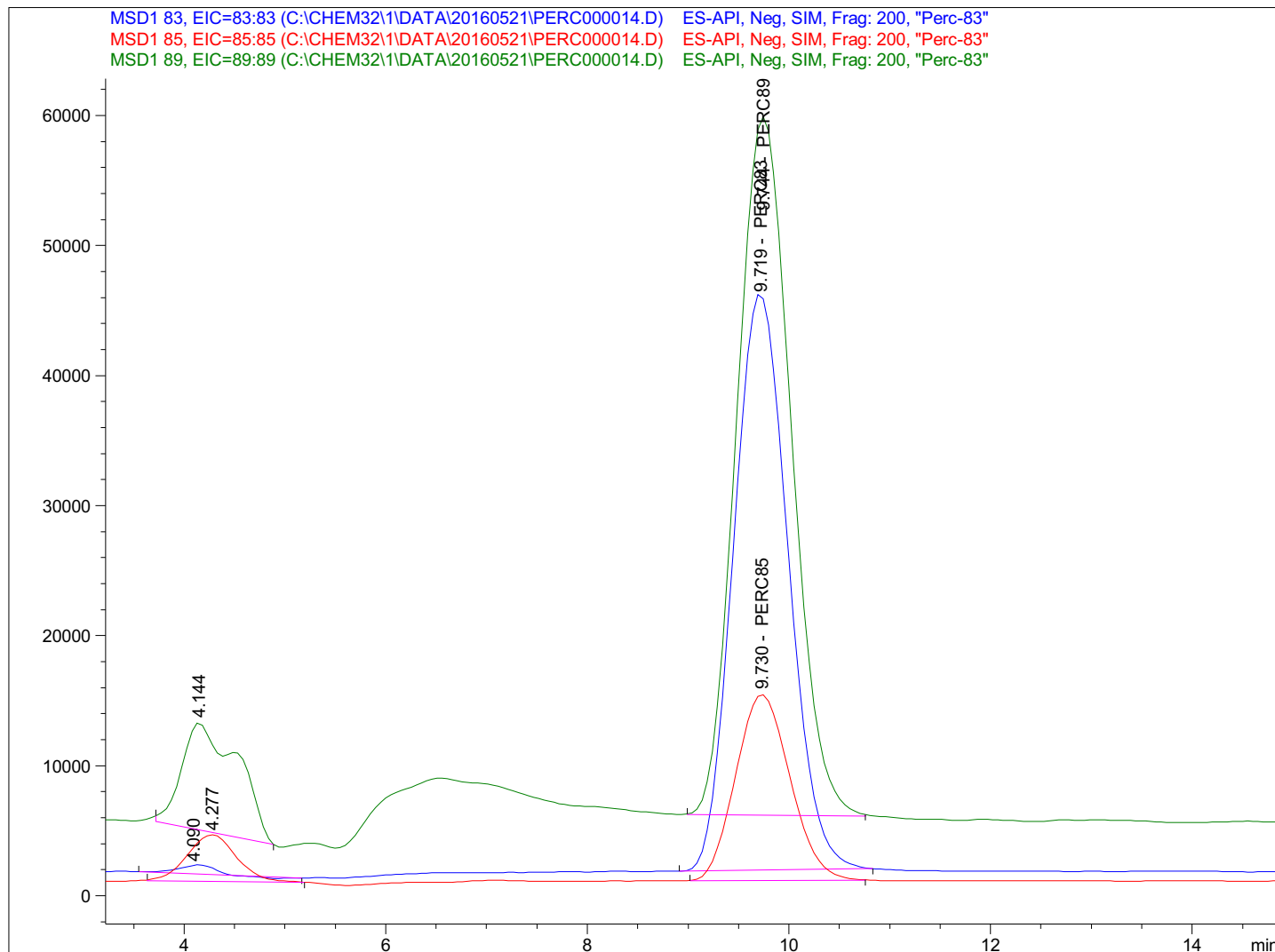
Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000014.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>6E14115</u>	Injection Date:	<u>05/21/16</u>
Lab Sample ID:	<u>6E14115-ICV1</u>	Injection Time:	<u>13:20</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Perchlorate	A	5.000	4.824	0.8535529	0.8235756		-3.5	15

```

=====
Acq. Operator   :                               Seq. Line :   14
Acq. Instrument : Instrument 1                 Location  : Vial 99
Injection Date  : 5/21/2016 1:20:06 PM       Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 5/23/2016 5:53:19 PM
=====
    
```



Internal Standard Report

```

Sorted By           : Signal
Calib. Data Modified : Monday, May 23, 2016 5:51:24 PM
Multiplier          : 1.0000
Dilution            : 1.0000
    
```

Use Multiplier & Dilution Factor with ISTDs

Sample ISTD Information:

ISTD #	ISTD Amount [ug/l]	Name
--------	--------------------	------

3	5.00000	PERC89
---	---------	--------

Sample Name: 6E14115-ICV1

Elisha Richard 00841784

[Signature] 5/23/2016

```

=====
Acq. Operator   :                               Seq. Line :   14
Acq. Instrument : Instrument 1                   Location  : Vial 99
Injection Date  : 5/21/2016 1:20:06 PM       Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 5/21/2016 8:58:44 AM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 5/23/2016 5:53:19 PM
=====

```

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.719	BBA	3	1.66597e6	1.17157	4.82440		PERC83

Totals without ISTD(s) : 4.82440

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.730	BB	3	5.36774e5	3.42345	4.54215		PERC85

Totals without ISTD(s) : 4.54215

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.744	BB	I 3	2.02285e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7A03115</u>	Injection Date:	<u>02/01/17</u>
Lab Sample ID:	<u>7A03115-CCV1</u>	Injection Time:	<u>15:24</u>

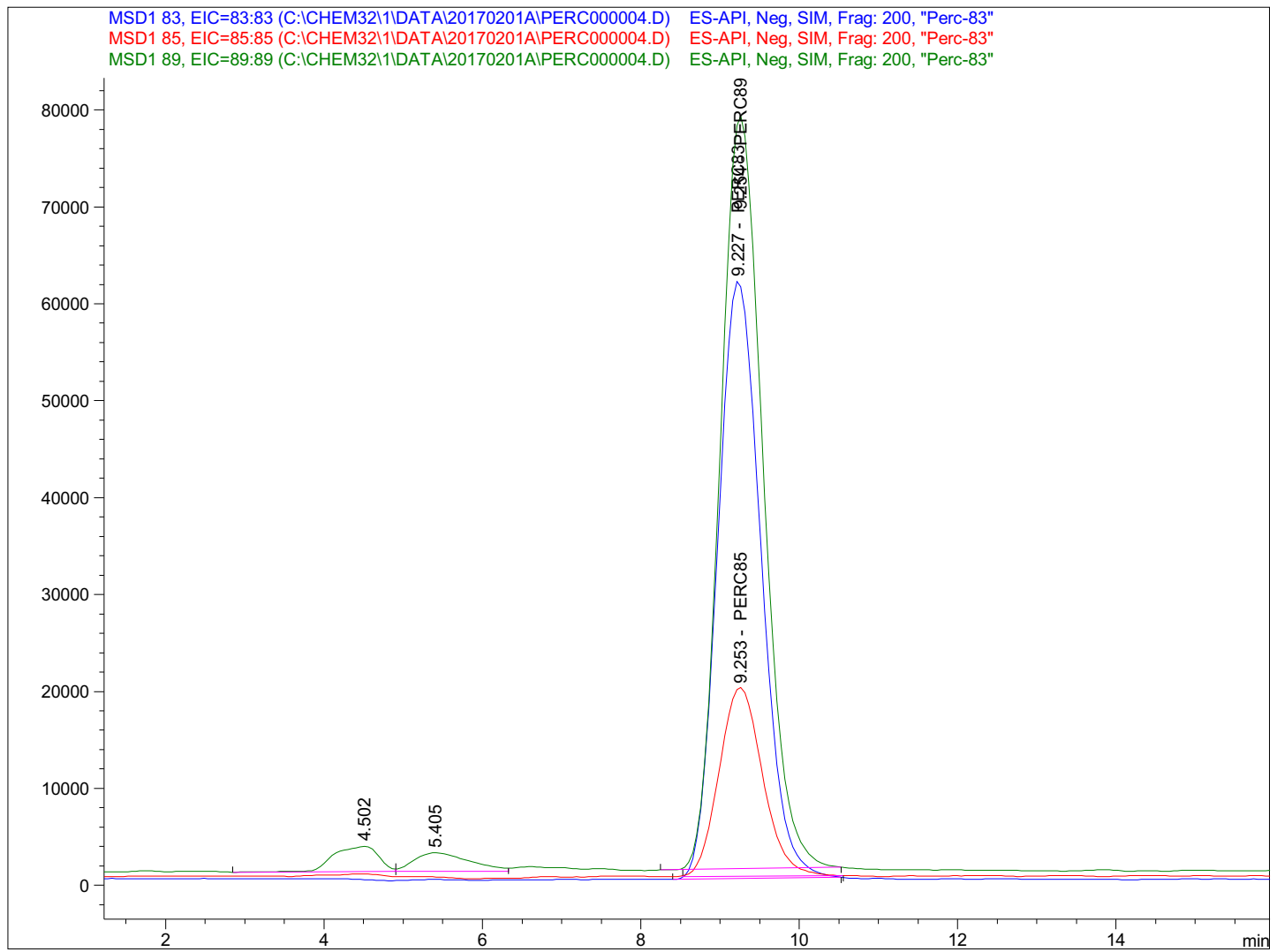
COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.706	0.8535529	0.8034404		-5.9	15


```

=====
Acq. Operator   :                               Seq. Line :    4
Acq. Instrument : Instrument 1                   Location  : Vial 3
Injection Date  : 2/1/2017 3:24:27 PM          Inj       :    1
                                                    Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:40:19 PM
                  (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : 2/1/2017 8:38:25 PM
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    4
Acq. Instrument : Instrument 1                 Location  : Vial 3
Injection Date  : 2/1/2017 3:24:27 PM        Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/1/2017 8:40:19 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.227	BBA	3	2.34697e6	1.17157	4.70645		PERC83

Totals without ISTD(s) : 4.70645

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.253	BBA	3	7.44136e5	3.42345	4.36046		PERC85

Totals without ISTD(s) : 4.36046

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.254	BBA	I 3	2.92115e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

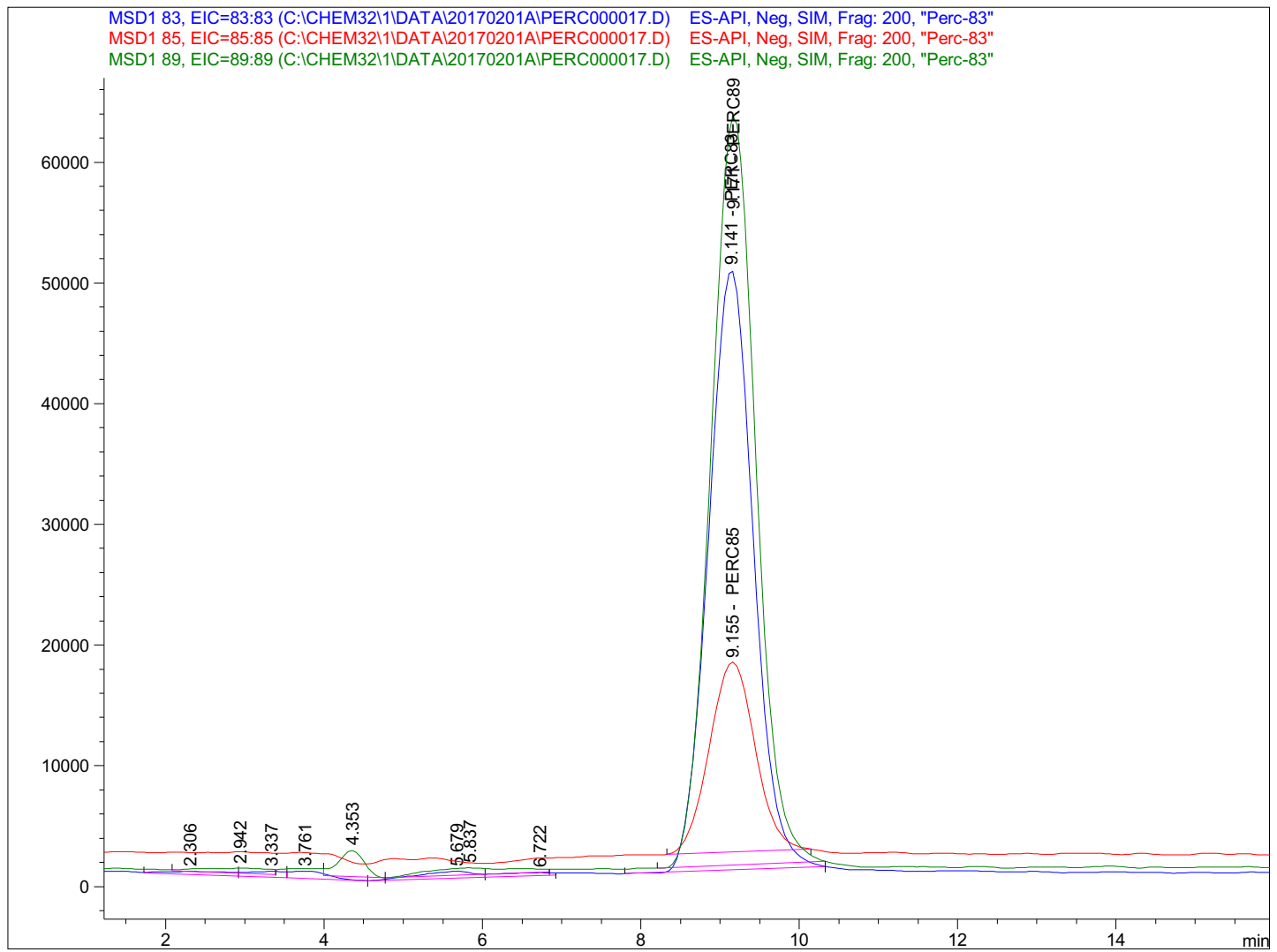
*** End of Report ***

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000017.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7A03115</u>	Injection Date:	<u>02/01/17</u>
Lab Sample ID:	<u>7A03115-CCV2</u>	Injection Time:	<u>19:30</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.706	0.8535529	0.8034183		-5.9	15

=====
Acq. Operator : Seq. Line : 17
Acq. Instrument : Instrument 1 Location : Vial 3
Injection Date : 2/1/2017 7:30:11 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 9:20:10 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/1/2017 9:20:02 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
[ug/l]
-----|-----|-----

=====
Acq. Operator : Seq. Line : 17
Acq. Instrument : Instrument 1 Location : Vial 3
Injection Date : 2/1/2017 7:30:11 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 9:20:10 PM
(modified after loading)
=====

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.141	BBA	3	1.96631e6	1.17157	4.70634		PERC83

Totals without ISTD(s) : 4.70634

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.155	BBA	3	6.30245e5	3.42345	4.40792		PERC85

Totals without ISTD(s) : 4.40792

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.171	VBA I	3	2.44743e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

=====
*** End of Report ***

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B03207</u>	Injection Date:	<u>02/02/17</u>
Lab Sample ID:	<u>7B03207-CCV1</u>	Injection Time:	<u>14:31</u>

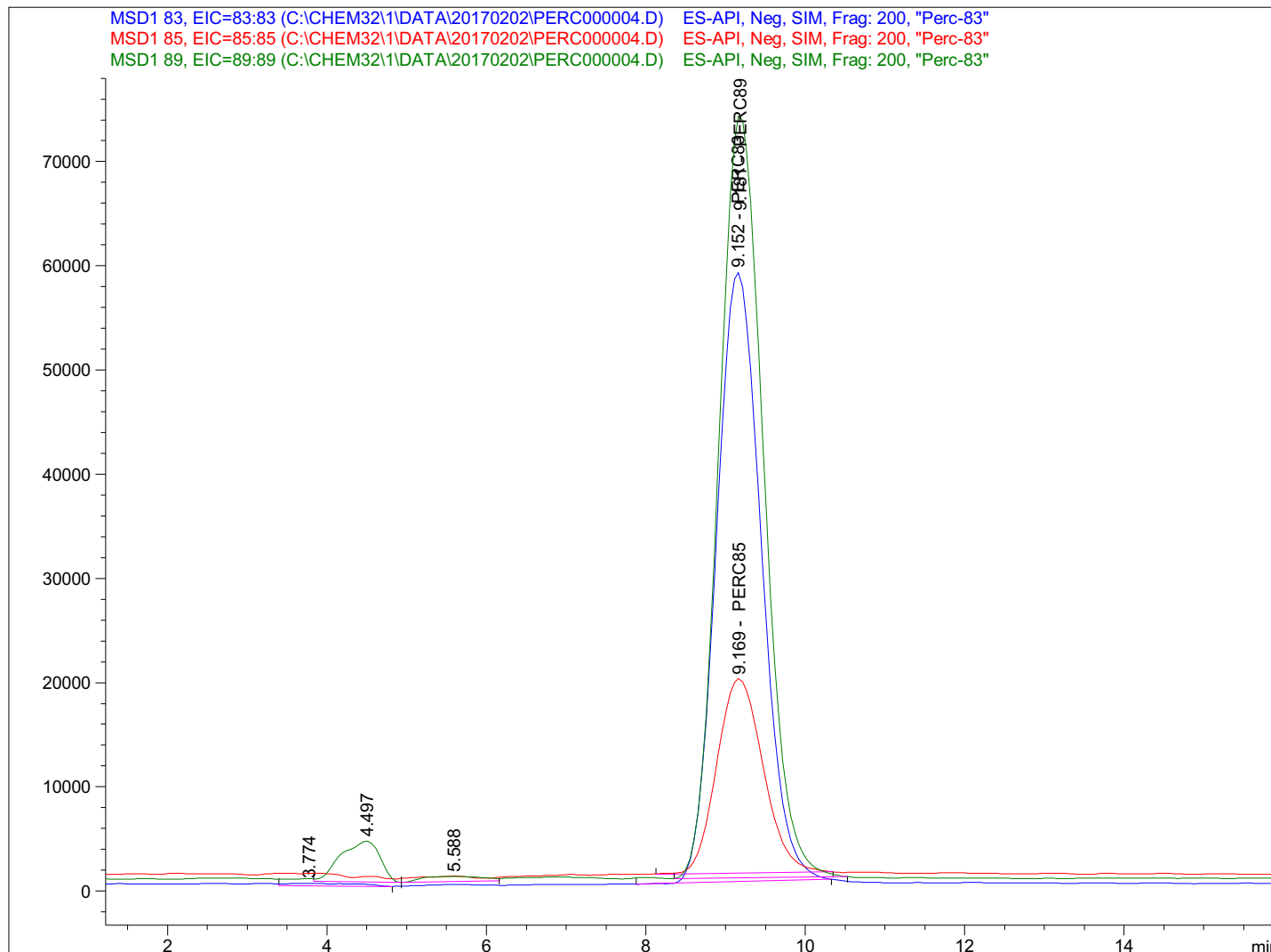
COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.684	0.8535529	0.7995707		-6.3	15

```

=====
Acq. Operator   :                               Seq. Line :    4
Acq. Instrument : Instrument 1                 Location  : Vial 3
Injection Date  : 2/2/2017 2:31:32 PM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 5:43:55 PM
                  (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By           :      Signal
Calib. Data Modified : 2/2/2017 5:43:56 PM
Multiplier          :      1.0000
Dilution            :      1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    4
Acq. Instrument : Instrument 1                   Location  : Vial 3
Injection Date  : 2/2/2017 2:31:32 PM         Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 5:43:55 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.152	VBA	3	2.29807e6	1.17157	4.68378		PERC83

Totals without ISTD(s) : 4.68378

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.169	BBA	3	7.54161e5	3.42345	4.49150		PERC85

Totals without ISTD(s) : 4.49150

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.181	BBA I	3	2.87413e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

CONTINUING CALIBRATION CHECK
SW6850

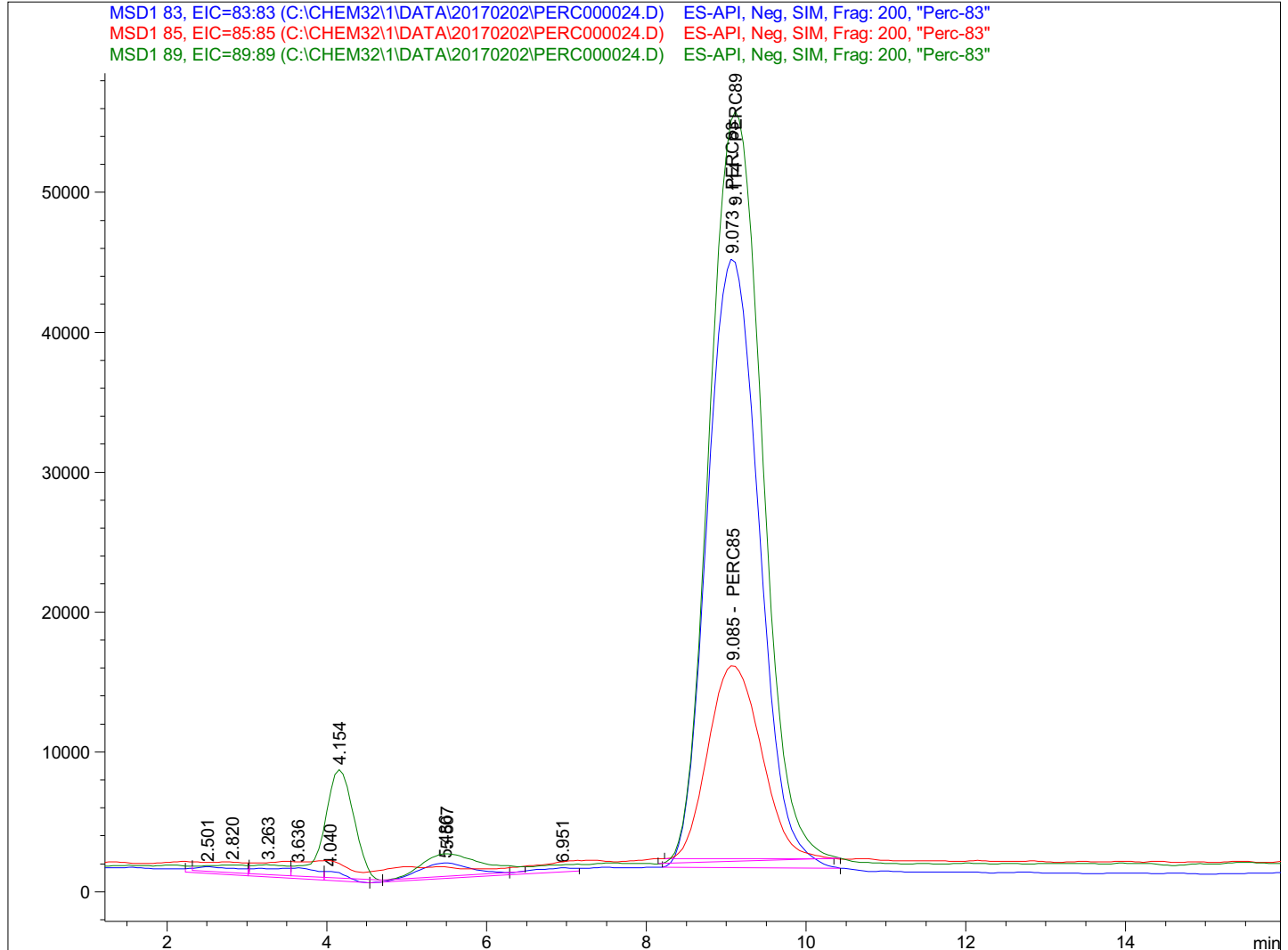
Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1701251</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Perchlorate</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000024.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B03207</u>	Injection Date:	<u>02/02/17</u>
Lab Sample ID:	<u>7B03207-CCV2</u>	Injection Time:	<u>21:15</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.724	0.8535529	0.8064085		-5.5	15

```

=====
Acq. Operator   :                               Seq. Line :   24
Acq. Instrument : Instrument 1                  Location  : Vial 3
Injection Date  : 2/2/2017 9:15:59 PM         Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/4/2017 6:56:16 AM
                  (modified after loading)
=====
    
```



Internal Standard Report

```

=====
Sorted By      :      Signal
Calib. Data Modified : 2/4/2017 6:56:07 AM
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----
    
```

```

=====
Acq. Operator   :                               Seq. Line :   24
Acq. Instrument : Instrument 1                 Location  : Vial 3
Injection Date  : 2/2/2017 9:15:59 PM        Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/4/2017 6:56:16 AM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.073	BBA	3	1.97208e6	1.17157	4.72385		PERC83

Totals without ISTD(s) : 4.72385

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.085	BBA	3	6.35892e5	3.42345	4.45091		PERC85

Totals without ISTD(s) : 4.45091

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.114	BBA I	3	2.44551e6	1.00000	5.00000		PERC89

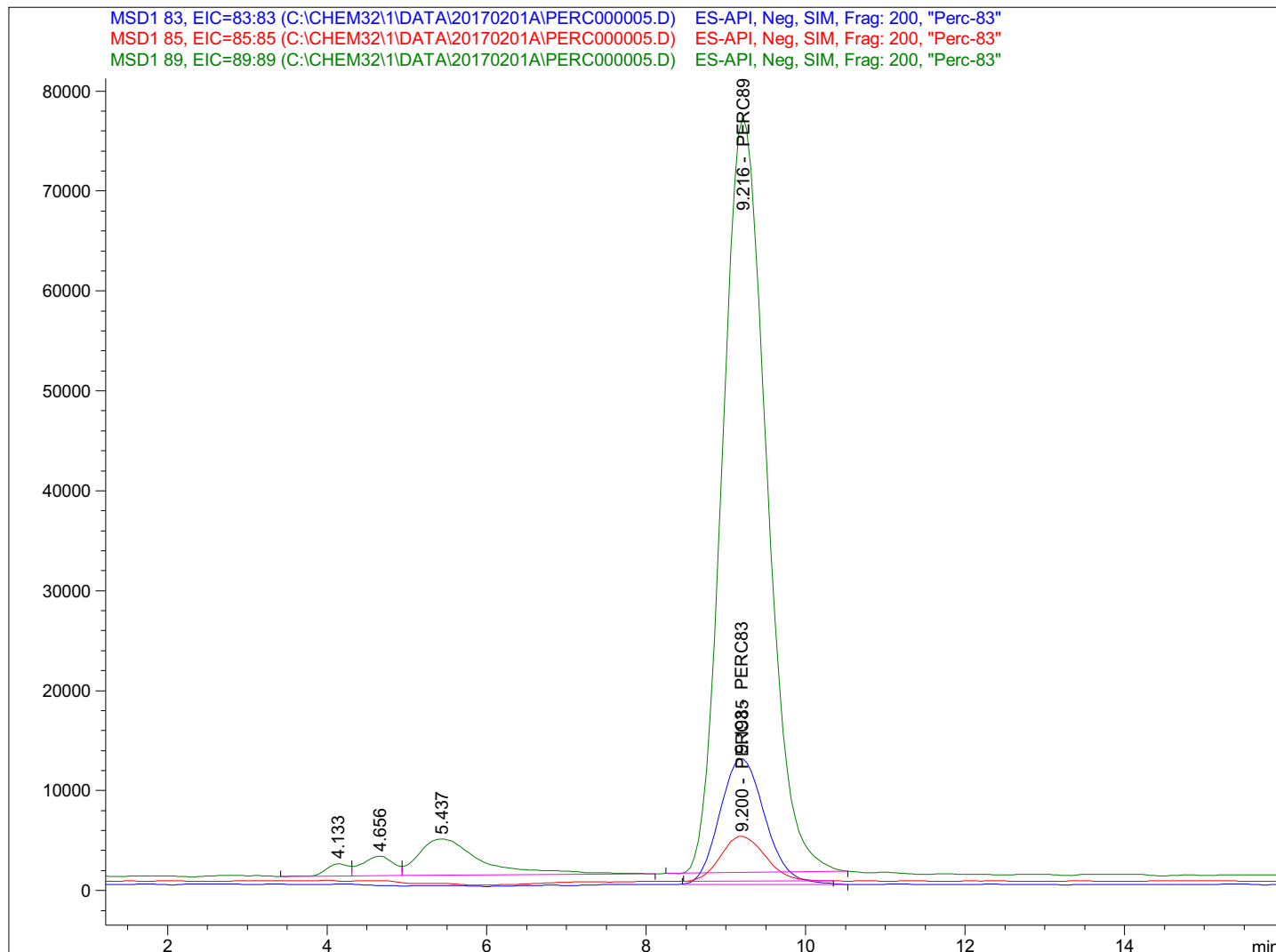
Totals without ISTD(s) : 0.00000

*** End of Report ***

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1701251**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Perchlorate**Calibration:** 6144001**Laboratory ID:** 7A03115-LCV1**Sequence:** 7A03115**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.006	0.6	30.00

=====
Acq. Operator : Seq. Line : 5
Acq. Instrument : Instrument 1 Location : Vial 4
Injection Date : 2/1/2017 3:43:18 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 8:41:52 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/1/2017 8:38:25 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
[ug/l]
-----|-----|-----

=====
Acq. Operator : Seq. Line : 5
Acq. Instrument : Instrument 1 Location : Vial 4
Injection Date : 2/1/2017 3:43:18 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 8:41:52 PM
(modified after loading)
=====

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.193	BBA	3	4.96840e5	1.17157	1.00555		PERC83

Totals without ISTD(s) : 1.00555

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.200	BBA	3	1.74748e5	3.42345	1.03346		PERC85

Totals without ISTD(s) : 1.03346

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.216	BBA	I 3	2.89437e6	1.00000	5.00000		PERC89

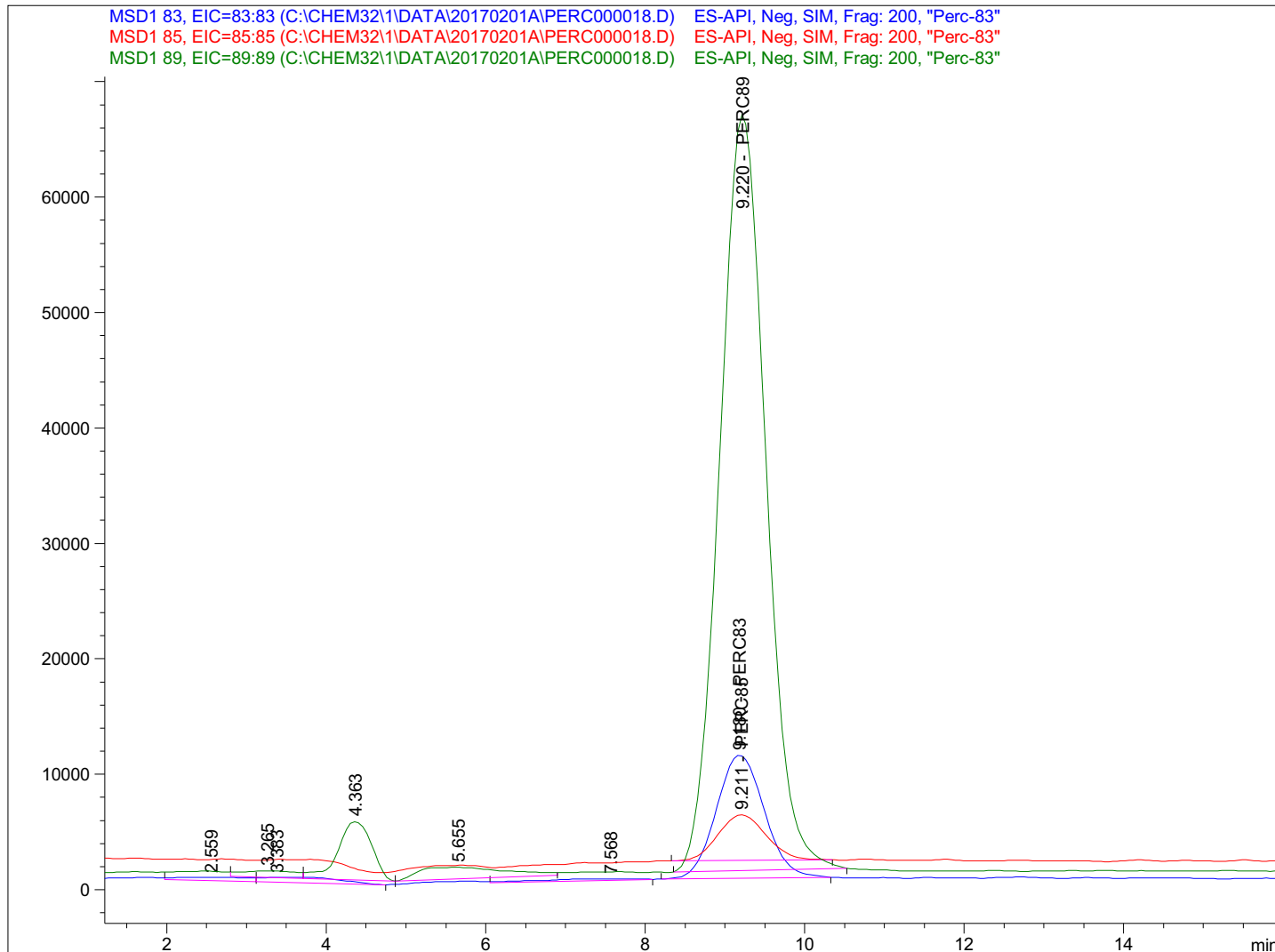
Totals without ISTD(s) : 0.00000

=====
*** End of Report ***

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1701251**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Perchlorate**Calibration:** 6144001**Laboratory ID:** 7A03115-LCV2**Sequence:** 7A03115**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9909	-0.9	30.00

=====
Acq. Operator : Seq. Line : 18
Acq. Instrument : Instrument 1 Location : Vial 4
Injection Date : 2/1/2017 7:48:58 PM Inj : 1
Inj Volume : 100.0 µl
Acq. Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed : 2/1/2017 9:21:52 PM
(modified after loading)
=====



=====
Internal Standard Report
=====

Sorted By : Signal
Calib. Data Modified : 2/1/2017 9:20:55 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
[ug/l]
-----|-----|-----


```

=====
Acq. Operator   :                               Seq. Line :   18
Acq. Instrument : Instrument 1                   Location  : Vial 4
Injection Date  : 2/1/2017 7:48:58 PM          Inj       :    1
                                                Inj Volume: 100.0 µl
Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/1/2017 9:21:52 PM
                (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.180	BBA	3	4.45391e5	1.17157	9.90926e-1		PERC83

Totals without ISTD(s) : 9.90926e-1

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.211	BBA	3	1.67363e5	3.42345	1.08807		PERC85

Totals without ISTD(s) : 1.08807

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.220	BBA	I 3	2.63293e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1701251**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Perchlorate**Calibration:** 6144001**Laboratory ID:** 7B03207-LCV1**Sequence:** 7B03207**Standard ID:** 17A0679

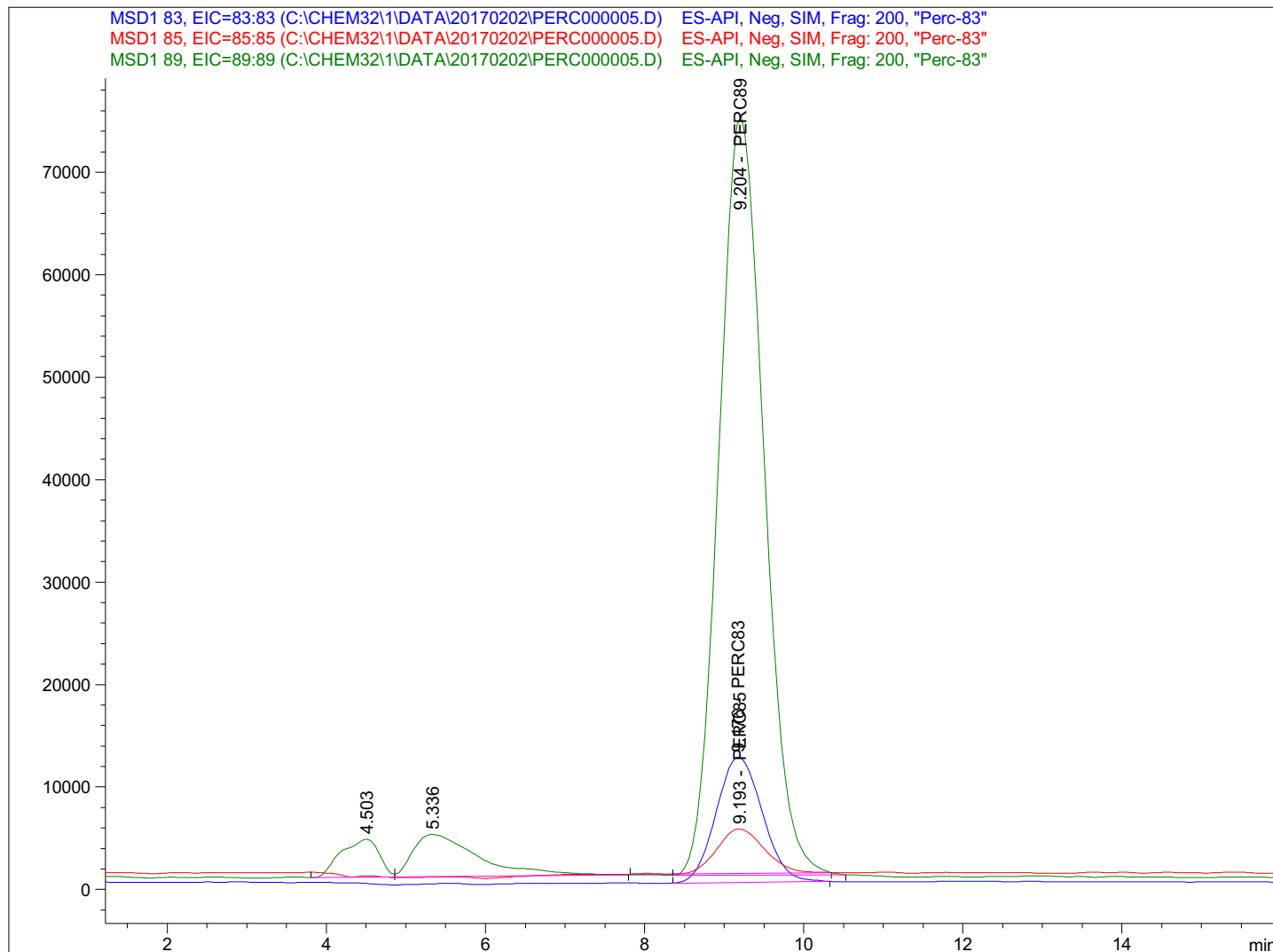
ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9919	-0.8	30.00

```

=====
Acq. Operator   :                               Seq. Line :    5
Acq. Instrument : Instrument 1                  Location  : Vial 4
Injection Date  : 2/2/2017 2:50:21 PM         Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 1/24/2017 3:06:45 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/2/2017 5:43:55 PM
                (modified after loading)
=====

```



```

=====
Internal Standard Report
=====

```

```

Sorted By           :      Signal
Calib. Data Modified : 2/2/2017 5:43:56 PM
Multiplier          :      1.0000
Dilution            :      1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD  ISTD Amount  Name
#      [ug/l]
-----|-----|-----

```

```

=====
Acq. Operator   :                               Seq. Line :    5
Acq. Instrument : Instrument 1                 Location  : Vial 4
Injection Date  : 2/2/2017 2:50:21 PM        Inj       :    1
                                           Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/2/2017 5:43:55 PM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.176	BBA	3	4.93197e5	1.17157	9.91858e-1		PERC83

Totals without ISTD(s) : 9.91858e-1

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.193	BBA	3	1.77848e5	3.42345	1.04513		PERC85

Totals without ISTD(s) : 1.04513

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.204	BBA	I 3	2.91280e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

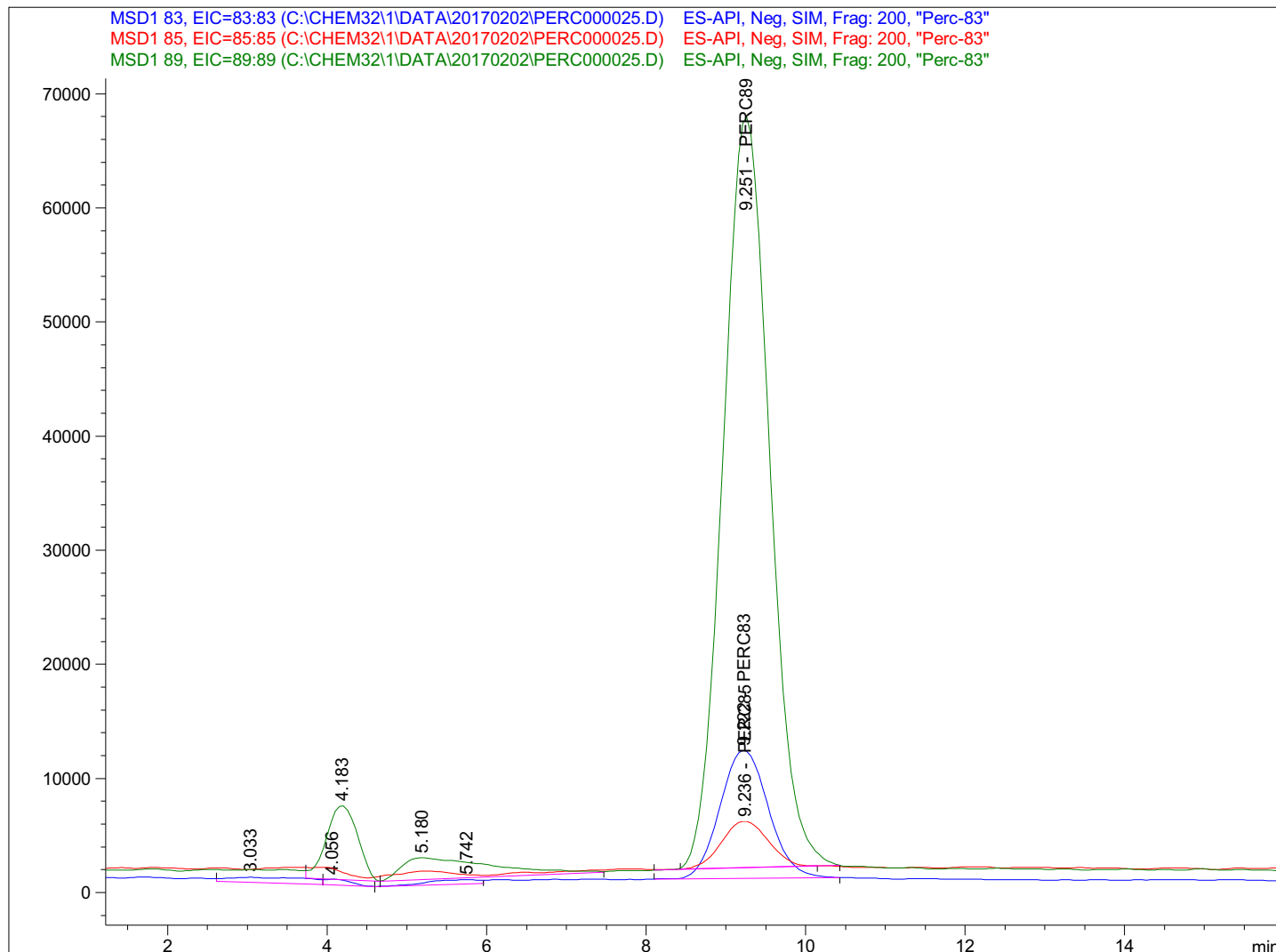
LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1701251**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Perchlorate**Calibration:** 6144001**Laboratory ID:** 7B03207-LCV2**Sequence:** 7B03207**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.038	3.8	30.00

```

=====
Acq. Operator   :                               Seq. Line :   25
Acq. Instrument : Instrument 1                  Location  : Vial 4
Injection Date  : 2/2/2017 9:34:51 PM         Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method    : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed   : 1/24/2017 3:06:45 PM
Analysis Method: C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed   : 2/4/2017 6:57:46 AM
                (modified after loading)
=====
    
```



Internal Standard Report

```

=====
Sorted By      : Signal
Calib. Data Modified : 2/4/2017 6:57:15 AM
Multiplier    : 1.0000
Dilution      : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Sample ISTD Information:
ISTD ISTD Amount Name
# [ug/l]
-----|-----|-----
    
```

```

=====
Acq. Operator   :                               Seq. Line :   25
Acq. Instrument : Instrument 1                 Location  : Vial 4
Injection Date  : 2/2/2017 9:34:51 PM      Inj       :    1
                                                Inj Volume: 100.0 µl

Acq. Method     : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS83.
Last changed    : 1/24/2017 3:06:45 PM
Analysis Method : C:\CHEM32\1\METHODS\PERCHLORATE_LCMS_052116CAL_83.M
Last changed    : 2/4/2017 6:57:46 AM
                  (modified after loading)
=====

```

3 5.00000 PERC89

Signal 1: MSD1 83, EIC=83:83

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.222	BBA	3	4.73745e5	1.17157	1.03755		PERC83

Totals without ISTD(s) : 1.03755

Signal 2: MSD1 85, EIC=85:85

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.236	BBA	3	1.65772e5	3.42345	1.06089		PERC85

Totals without ISTD(s) : 1.06089

Signal 3: MSD1 89, EIC=89:89

RetTime [min]	Type	ISTD used	Area	Amt/Area ratio	Amount [ug/l]	Grp	Name
9.251	BBA I	3	2.67470e6	1.00000	5.00000		PERC89

Totals without ISTD(s) : 0.00000

*** End of Report ***

HOLDING TIME SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1701251Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: Perchlorate

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LH18/24-SP650-6416-Grab	01/30/17 15:00	01/31/17 09:40	01/31/17 14:59	1.00	28.00	02/02/17 15:46	3.03	28.00	

PREPARATION BENCH SHEET

7A31017

Empirical Laboratories, LLC

Printed: 2/7/2017 12:18:03PM

Instrument: LCMS1

Prepared using: GCLC - PERC_6850_W

(No Surrogate)

Matrix: Water

Lab Number	Cont ID	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1701251-01	A	LCMS_PERC_6850_Q5	01/31/2017	10.00	10.00					NA	Diluted 10x due to conductivity KEP 1-31-17
7A31017-BLK1		LCMS_PERC_6850_Q5	01/31/2017	10.00	10.00					NA	
7A31017-BS1		LCMS_PERC_6850_Q5	01/31/2017	10.00	10.00	17A0609		20		NA	

Reagents Used:

Standard	Description
16J0607	Water HPLC GRADE

SEQUENCE TABLE:

```

=====
Line           : 1
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

Eluent ID 16E0510
16E0510

```

=====
Line           : 2
Location       : Vial 1
Sample Information :
Sample Name    : 6E14115-TUN1 16D0464
=====

```

```

=====
Line           : 3
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 4
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 5
Location       : Vial 91
Sample Information :
Sample Name    : 6E14115-CAL1 16D0529
=====

```

```

=====
Line           : 6
Location       : Vial 92
Sample Information :
Sample Name    : 6E14115-CAL2 16D0529
=====

```

```

=====
Line           : 7
Location       : Vial 93
Sample Information :
Sample Name    : 6E14115-CAL3 16D0530
=====

```

```

=====
Line           : 8
Location       : Vial 94
Sample Information :
Sample Name    : 6E14115-CAL4 16D0531
=====

```

Line : 9
Location : Vial 95
Sample Information :
Sample Name : 6E14115-CAL5 1600532

=====
Line : 10
Location : Vial 96
Sample Information :
Sample Name : 6E14115-CAL6 1600533

=====
Line : 11
Location : Vial 97
Sample Information :
Sample Name : 6E14115-CAL7 1600534

=====
Line : 12
Location : Vial 98
Sample Information :
Sample Name : 6E14115-CAL8 1600536

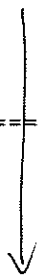
=====
Line : 13
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 14
Location : Vial 99
Sample Information :
Sample Name : 6E14115-ICV1 1600537

=====
Line : 15
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV1 NOT USING

=====
Line : 16
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV1

=====
Line : 17
Location : Vial 5
Sample Information :
Sample Name : 6E14115-IFAL



01671

```

=====
Line           : 18
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank NOT USING
=====

```

```

=====
Line           : 19
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 20
Location      : Vial 41
Sample Information :
Sample Name    : 1605063-01@100
=====

```

```

=====
Line           : 21
Location      : Vial 42
Sample Information :
Sample Name    : 1605063-02@100
=====

```

```

=====
Line           : 22
Location      : Vial 3
Sample Information :
Sample Name    : 6E14115-CCV2
=====

```

```

=====
Line           : 23
Location      : Vial 4
Sample Information :
Sample Name    : 6E14115-LCV2
=====

```

```

=====
Line           : 24
Location      : Vial 5
Sample Information :
Sample Name    : 6E-IFA1
=====

```

```

=====
Line           : 25
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 26
Location      : Vial 2
=====

```

00841814
SR 5-23-16
P1672

Sample Information :
Sample Name : Reagent Blank

=====
Line : 27
Location : Vial 51
Sample Information :
Sample Name : 6E-IFA2600

=====
Line : 28
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 29
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

WHEA

SEQUENCE TABLE: *eluent ID= 17A0620 17A0619*

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7A03115-TUN1 *17A0671*
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : 7A03115-CCV1 *17A0678*
=====

=====
Line : 5
Location : Vial 4
Sample Information :
Sample Name : 7A03115-LCV1 *17A0679*
=====

=====
Line : 6
Location : Vial 5
Sample Information :
Sample Name : 7A03115-IFA1 *16F0477*
=====

=====
Line : 7
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 8
Location : Vial 6
Sample Information :
Sample Name : 7A31017-BLK1
=====

=====
Line : 9
Location : Vial 7
Sample Information :
Sample Name : 7A31017-BS1
=====

=====
Line : 10
Location : Vial 8
Sample Information :
Sample Name : 1701251-01@10
=====

=====
Line : 11
Location : Vial 9
Sample Information :
Sample Name : 1701231-01 x1
=====

=====
Line : 12
Location : Vial 10
Sample Information :
Sample Name : 7A31017-MS1
=====

=====
Line : 13
Location : Vial 11
Sample Information :
Sample Name : 7A31017-MSD1 ↓
=====

=====
Line : 14
Location : Vial 14
Sample Information :
Sample Name : 1701251-01@500
=====

=====
Line : 15
Location : Vial 12
Sample Information :
Sample Name : 1701231-02 x1
=====

=====
Line : 16
Location : Vial 13
Sample Information :
Sample Name : 1701102-01@2
=====

=====
Line : 17
Location : Vial 3
Sample Information :
Sample Name : 7A03115-CCV2 17A0678
=====

=====
Line : 18
Location : Vial 4
Sample Information :
Sample Name : 7A03115-LCV2 17A0679
=====

Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====

2-3-17

[Handwritten signature]

SEQUENCE TABLE: *eluent ID. 17A0620 17A0619*

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information : *7303207 KP 2-6-17*
Sample Name : ~~7A03207~~-TUN1 *17A0677*
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information : *7303207 KP 2-6-17*
Sample Name : ~~7A03207~~-CCV1 *17A0678*
=====

=====
Line : 5
Location : Vial 4
Sample Information : *7303207 KP 2-6-17*
Sample Name : ~~7A03207~~-LCV1 *17A0679*
=====

=====
Line : 6
Location : Vial 5
Sample Information : *7303207 KP 2-6-17*
Sample Name : ~~7A03207~~-IFA1 *16F0477*
=====

=====
Line : 7
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 8
Location : Vial 6
Sample Information :
Sample Name : 1701251-01@500
=====

=====
Line : 9
Location : Vial 7
Sample Information :
Sample Name : 1701217-02@20
=====

Not all

=====
 Line : 10
 Location : Vial 8
 Sample Information :
 Sample Name : 1701231-02@2
 =====

=====
 Line : 11
 Location : Vial 9
 Sample Information :
 Sample Name : 1701197-01
 =====

=====
 Line : 12
 Location : Vial 10
 Sample Information :
 Sample Name : 7A27012-MS1
 =====

=====
 Line : 13
 Location : Vial 11
 Sample Information :
 Sample Name : 7A27012-MSD1
 =====

=====
 Line : 14
 Location : Vial 12
 Sample Information :
 Sample Name : 7B02028-BLK1
 =====

=====
 Line : 15
 Location : Vial 13
 Sample Information :
 Sample Name : 7B02028-BS1
 =====

=====
 Line : 16
 Location : Vial 14
 Sample Information :
 Sample Name : 1701238-01
 =====

=====
 Line : 17
 Location : Vial 15
 Sample Information :
 Sample Name : 7B02028-MS1
 =====

=====
 Line : 18
 Location : Vial 16
 Sample Information :
 Sample Name : 7B02028-MSD1
 =====

x1



← **HAZ LEAK DETECTED IN AUTOSAMPLER @ BASE**
OF INJECTION NEEDLE; RE-STARTED
 2-2-17

2-2-17

2-3-17

[Handwritten signature]

Location : Vial 17
Sample Information :
Sample Name : 1701257-01 X!

=====
Line : 20
Location : Vial 18
Sample Information :
Sample Name : 1701257-02

=====
Line : 21
Location : Vial 19
Sample Information :
Sample Name : 1701257-03

=====
Line : 22
Location : Vial 20
Sample Information :
Sample Name : 1701257-04

=====
Line : 23
Location : Vial 21
Sample Information :
Sample Name : 1701257-05

=====
Line : 24
Location : Vial 3
Sample Information :
Sample Name : 7B03207-CCV2 17A0678

=====
Line : 25
Location : Vial 4
Sample Information :
Sample Name : 7B03207-LCV2 17A0679

=====
Line : 26
Location : Vial 22
Sample Information :
Sample Name : 1701257-06 X!

=====
Line : 27
Location : Vial 23
Sample Information :
Sample Name : 1701261-01

=====
Line : 28
Location : Vial 24
Sample Information : 1701263-01

MA elly

=====
Line : 29
Location : Vial 3
Sample Information :
Sample Name : 7B03207-CCV3 *17A0678*
=====

=====
Line : 30
Location : Vial 4
Sample Information :
Sample Name : 7B03207-LCV3 *17A0679*
=====

=====
Line : 31
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

Perchlorate Analysis Evaluation

5/21/2016

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
Perchlorate 0.2 ug/L	65435.8	27872.8	2.3	2085020		9.707	9.729	0.998
Perchlorate 0.5 ug/L	162300	60086.9	2.7	2067670		9.733	9.741	0.999
Perchlorate 1.0 ug/L	327868	115234	2.8	2093390		9.679	9.699	0.998
Perchlorate 2.0 ug/L	670491	225125	3.0	2045940		9.729	9.751	0.998
Perchlorate 5.0 ug/L	1755730	562562	3.1	2072140		9.719	9.74	0.998
Perchlorate 10 ug/L	3646000	1146590	3.2	2063840		9.702	9.722	0.998
Perchlorate 20 ug/L	7550470	2386510	3.2	2032520		9.735	9.746	0.999
Perchlorate 50 ug/L	19125900	6116300	3.1	1918010		9.705	9.717	0.999
Perchlorate 5.0 ug/L ICV	1665970	536774	3.1	2022850	98.80	9.719	9.744	0.997
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
Average IS area of curve:	2047316							

83/85 Ratio Criteria 2.3-3.8
 RRT Criteria 0.98-1.02
 IS Recovery Criteria ± 50% of Avg IS of curve
 CAL Date 04/25/16

Perchlorate Analysis Evaluation

1/31/2017 Seq. ID #7A03115

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1701102-01	3056430	964851	3.168	1989520	97.177	8.804	8.841	0.996
1701231-01	0	0		2609060	127.438	9	9.022	0.998
7A03115-CCV1	2346970	744136	3.154	2921150	142.682	9.227	9.254	0.997
7A03115-CCV2	1966310	630245	3.12	2447430	119.543	9.141	9.171	0.997
7A03115-IFA1	466790	151799	3.075	1432300	69.96	7.268	7.321	0.993
7A03115-LCV1	496840	174748	2.843	2894370	141.374	9.193	9.216	0.998
7A03115-LCV2	445391	167363	2.661	2632930	128.604	9.18	9.22	0.996
7A31017-BLK1	15897.4	0		2606470	127.312	9.298	9.304	0.999
7A31017-BS1	927112	311970	2.972	2856820	139.54	9.284	9.32	0.996
7A31017-MS1	753403	268102	2.81	2346740	114.625	8.94	8.972	0.996
7A31017-MSD1	729703	263362	2.771	2186650	106.806	8.777	8.799	0.997

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

Perchlorate Analysis Evaluation

2/2/2017 Seq. ID #7B03207

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1701197-01	170422	59507.6	2.864	2476020	120.94	8.722	8.728	0.999
1701231-02	62193.5	0		2472450	120.765	8.495	8.517	0.997
1701238-01	0	0		2849120	139.164	9.2	9.315	0.988
1701251-01	5220290	1619630	3.223	2831210	138.289	8.811	8.846	0.996
1701257-02	20293.4	0		2890830	141.201	9.177	9.252	0.992
1701257-03	16178	0		2158190	105.416	9.18	9.216	0.996
1701257-04	0	0		2610590	127.513	8.8	8.766	1.004
1701257-05	35429.8	0		2705990	132.173	8.895	8.973	0.991
7A27012-MS1	1032480	357912	2.885	2617050	127.828	8.765	8.789	0.997
7A27012-MSD1	1076630	361593	2.977	2745440	134.099	8.758	8.796	0.996
7B02028-BLK1	0	0		2228810	108.865	9.2	9.265	0.993
7B02028-BS1	924929	316980	2.919	2797870	136.66	9.216	9.255	0.996
7B02028-MS1	970862	326902	2.97	2980300	145.571	9.27	9.311	0.996
7B02028-MSD1	909718	310205	2.933	2895960	141.452	9.381	9.415	0.996
7B03207-CCV1	2298070	754161	3.047	2874130	140.385	9.152	9.181	0.997
7B03207-CCV2	1972080	635892	3.101	2445510	119.45	9.073	9.114	0.996
7B03207-IFA1	505636	156745	3.226	1462080	71.414	7.357	7.395	0.995
7B03207-LCV1	493197	177848	2.773	2912800	142.274	9.176	9.204	0.997
7B03207-LCV2	473745	165772	2.858	2674700	130.644	9.222	9.251	0.997

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

**ANALYTICAL DATA PACKAGE**

SDG # 1702196

PROJECT NAME: Perchlorate**SUBMITTAL TO:**

Stephanie Mossburg
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, OH 45750

SUBMITTAL BY:

Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (866)417-0548

LABORATORY CONTACT PERSON:

Project Manager: Sonya Gordon
Tel (615)345-1115
Fax (866)417-0548
Email: sgordon@empirlabs.com

Original Report Date: February 27, 2017

Report Revision #: 01

Revision Date: March 16, 2017

THIS DOCUMENT MEETS DoD QSM 5.0 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Data Review Manager, Ms. Amy Barnett, is responsible for the final data produced and reported. Her signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

L-A-B Accredited - Certificate Number L2226 - Testing

Table of Contents

#	Description
1	Cover Page
2	Table of Contents
3	Case Narrative
4	Sample Receipt Information Chain of Custody Forms Sample Receipt Confirmations WorkOrder Summary Sample Delivery Group (SDG) Sheets
5	Data for Perchlorate Required Data / QAQC / Calibration Forms Supporting Raw Data / Logs

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to provide a level III package instead of a level IV.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

Perchlorate:

No anomalies or deviations are noted.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- DL:** The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** Exceeding quality control criteria are associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.
- H:** The result was analyzed, extracted, or received outside of the EPA recommended holding time.
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it

indicates that the parameters DL/LOD/LOQ have been raised.

- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.
- Q:** The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.
- S:** The associated internal standard exceeded criteria.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.
- X:** The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.
- Y:** The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.
- Z:** The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

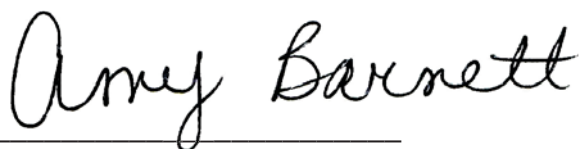
- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to

assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.
- MS:** The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.
- IDs:** The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Ms. Amy M. Barnett
Data Review Manager

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 01/18/2017)

00841831

DoD ELAP QSM5.0, Certificate Number L2226

- Aqueous
- Non-aqueous
- Expires: 11/30/2018

State of Florida, Department of Health – NELAP Primary, Lab ID: E87646

- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2017

State of Georgia, Environmental Protection Agency – NELAP, Self Certification

- Expires: 06/30/2017

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017

- Wastewater
- Expires: 12/31/2017

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77

- Aqueous
- Non-aqueous
- Expires: 06/30/2017

State of New Jersey, Department of Environmental Protection – NELAP, Lab ID: TN473

- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2017

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-16-14

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Utah, Department of Health – NELAP, Certificate Number: TN0042016-8

- Aqueous
- Non-aqueous
- Expires: 07/31/2017

**Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 8924,
Lab ID: 460243**

- Aqueous
- Non-aqueous
- Expires: 12/14/2017

State of Washington, Department of Ecology – NELAP, Lab ID: C934-16

- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2017

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg)} * \text{Expected Vol/Weight (mL or g)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL)} * \text{Final Vol (ml)} * \text{Dilution} * (1000\text{uL/mL})}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL)} * \text{Final Vol (mL)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Sample Receipt Information



1702196-01 A

CHAIN OF CUSTODY

RICAL (615) 345-1115 ATTN: SONYA GORDON

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No.: 60256135.GWTPT HRUMAR16	
Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES			
Prepared By: Scott Beesinger		P.O. Number	
Field Sample I.D.: LH18/24-SP650-6417-Grab 01	Sample Matrix Water	Date / Time 02/22/17 / 10:00	MS / MSD 1
No. OF CONTAINERS 1		ANALYSES PERCHLORATE	
Remarks (Preservatives, etc.)		Lab I.D.#	

Additional Remarks: 24 HOUR TAT Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>[Signature]</i>	02/22/17	15:00									

For Lab Use Only

Received At Lab By: <i>[Signature]</i>	Date 2/22/17	Time 950	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition
--	------------------------	--------------------	--------------------	-------------	-------------	--------------------------	-----------------	------------------

Remarks:

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 2/23/17@0850 950

Work-order# 1702196

- 1. Tracking # 8903 (last 4 digits, FedEx)
Courier: FedEx UPS
- 2. Temperature of rep. sample or temp blank when opened: 4.6 °C + correction factor (-0.1) = 4.5 °C
(Temp Fluke#1 SN17680086)
- 3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA
- 4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: NA
- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 2/23/17

- 7. Were custody seals on containers: YES and Intact YES...NO...NA
Were these signed and dated correctly? YES...NO...NA
- 8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc.)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13. a. Were VOA vials received? YES...NO...NA
b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA
- 14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 2/23/17

- 15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA
b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA
- 16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documented? YES...NO...NA
- 17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documented? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) TH 2/23/17

- 18. Were custody papers properly filled out (ink, signed, etc.)? YES...NO...NA
- 19. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 20. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA
- 21. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA
- 22. Were there Non-Conformance issues at login? YES...NO...NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) TH 2/23/17
I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) TH 2/23/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 2/23/17



Empirical Laboratories, LLC

WORK ORDER

1702196

Client: Microbac Laboratories, Inc.-Ohio Valley Division
Project: Longhorn

Project Manager: Sonya Gordon
Project Number: MIC_Perc

Report To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone: (740) 373-4071
 Fax: (740) 373-4835

Invoice To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Stephanie Mossburg
 158 Starlite Drive
 Marietta, OH 45750
 Phone : (740) 373-4071
 Fax: (740) 373-4835

Date Due: 02/24/2017 16:00 (1 day TAT)

Date Received: 02/23/2017 09:50

Logged In By: Tiana L. Hutchings

Received By: Tiana L. Hutchings

Samples Received at: **4.5°C**

Custody seals on the o	Yes	Samples received on i	Yes	Any headspace in vials	No
All containers in good	Yes	Custody seals intact?	Yes	Trip blank received?	No
Did the containers mat	Yes	Proper packing materi	Yes	Cyanide Effluent samp	No
Preserved containers a	No	VOA vials received?	No	608 Pest/PCB sample:	No

Analysis	TAT	Expires	Version	Comments
1702196-01 LH18/24-SP650-6417-Grab [Water] Sampled 02/22/2017				
10:00 (GMT-06:00) Central Time (US & Canada)				
LCMS_PERC_6850_Q5	1	03/22/2017 10:00		

Sample Delivery Group Assignment Form

CLIENT: Microbac Laboratories, Inc.-Ohio Valley Division

PROJECT NAME: Longhorn

SDG #: 1702196

QC LEVEL: Level IV

Report Due: 2/24/2017

Client Sample Count: 1

Sample Type	Sampled	Received	Lab ID	Client ID	Lab Matrix	SW6850
Client Sample	2/22/2017	2/23/2017	1702196-01	LH18/24-SP650-6417-Grab	Water	X

Forms For Perchlorates

Sample Extraction Data

Prep Method: PERC_6850_W-SW6850

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [mL]	Final [mL]	Dilution	% Solids	Notes	Date
1702196-01 [LH18/24-SP650-6417-Grab]	7B23020	10.00/10.00	10.0	10.0	500.00			02/23/17

ANALYSIS DATA SHEET

LH18/24-SP650-6417-Grab

Laboratory: Empirical Laboratories, LLC SDG: 1702196
 Client: Microbac Laboratories, Inc.-Ohio Vall Project: Longhorn
 Matrix: Water Laboratory ID: 1702196-01 File ID: PERC000040.D.Report.TXT
 Sampled: 02/22/17 10:00 Prepared: 02/23/17 13:30 Analyzed: 02/24/17 01:41
 Solids: Preparation: PERC 6850 W Dilution: 500
 Batch: 7B23020 Sequence: 7B05408 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	519	250	500	1000	JD

Total Target Analytes Reported 1 Project Analytes: 1

LCS / LCS DUPLICATE RECOVERY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1702196
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Matrix: Water
Batch: 7B23020 Laboratory ID: 7B23020-BS1
Preparation: PERC_6850_W Initial/Final: 10 mL / 10 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Perchlorate	2.000	1.864	93.2	84 - 119

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: 1702196
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7B23020-BLK1 File ID: PERC000041.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/24/17 02:00
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7B23020 Sequence: 7B05408 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		0.500	1.00	2.00	U

Total Target Analytes Reported: 1

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1702196
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7B23020-BS1 File ID: PERC000042.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/24/17 02:19
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7B23020 Sequence: 7B05408 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	1.864	0.500	1.00	2.00	J

Total Target Analytes Reported: 1

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Lab File ID:	<u>PERC000002.D.Report.TXT</u>	Injection Date:	<u>05/21/16</u>
Instrument ID:	<u>LCMS1</u>	Injection Time:	<u>09:46</u>
Sequence:	<u>6E14115</u>	Lab Sample ID:	<u>6E14115-TUN1</u>

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW6850

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1702196</u>
Client: <u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project: <u>Longhorn</u>
Lab File ID: <u>PERC000002.D.Report.TXT</u>	Injection Date: <u>02/23/17</u>
Instrument ID: <u>LCMS1</u>	Injection Time: <u>13:45</u>
Sequence: <u>7B05408</u>	Lab Sample ID: <u>7B05408-TUN1</u>

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7B05408

Lab Sample ID	Analyte	True	Found	%R	Units
7B05408-IFA1	Perchlorate-d18	5.000	5.00	61.6	ug/L
	Perchlorate	2.000	1.98	99.2	ug/L

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7B05408

Lab Sample ID	Analyte	True	Found	%R	Units
7B05408-IFA2	Perchlorate-d18	5.000	5.00	90.4	ug/L
	Perchlorate	2.000	2.02	101	ug/L

ANALYSIS SEQUENCE SUMMARY

SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1702196
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7B05408 Instrument: LCMS1
 Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	7B05408-TUN1	PERC000002.D.Report.TXT	02/23/17 13:45
Calibration Check	7B05408-CCV1	PERC000004.D.Report.TXT	02/23/17 14:22
Low Cal Check	7B05408-LCV1	PERC000005.D.Report.TXT	02/23/17 14:41
Interference Check A	7B05408-IFA1	PERC000006.D.Report.TXT	02/23/17 15:00
Calibration Check	7B05408-CCV2	PERC000022.D.Report.TXT	02/23/17 20:02
Low Cal Check	7B05408-LCV2	PERC000023.D.Report.TXT	02/23/17 20:20
Calibration Check	7B05408-CCV3	PERC000036.D.Report.TXT	02/24/17 00:26
Low Cal Check	7B05408-LCV3	PERC000037.D.Report.TXT	02/24/17 00:45
Interference Check A	7B05408-IFA2	PERC000038.D.Report.TXT	02/24/17 01:03
LH18/24-SP650-6417-Grab	1702196-01	PERC000040.D.Report.TXT	02/24/17 01:41
Blank	7B23020-BLK1	PERC000041.D.Report.TXT	02/24/17 02:00
LCS	7B23020-BS1	PERC000042.D.Report.TXT	02/24/17 02:19
Calibration Check	7B05408-CCV4	PERC000052.D.Report.TXT	02/24/17 05:27
Low Cal Check	7B05408-LCV4	PERC000053.D.Report.TXT	02/24/17 05:46

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1702196
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7B05408 Instrument: LCMS1
 Calibration: 6144001

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7B05408-CCV1)		Lab File ID: PERC000004.D.Report.TXT			Analyzed: 02/23/17 14:22	
Perchlorate-d18	2319060	9.261	2047316	113	50 - 150	
Low Cal Check (7B05408-LCV1)		Lab File ID: PERC000005.D.Report.TXT			Analyzed: 02/23/17 14:41	
Perchlorate-d18	2338540	9.239	2047316	114	50 - 150	
Interference Check A (7B05408-IFA1)		Lab File ID: PERC000006.D.Report.TXT			Analyzed: 02/23/17 15:00	
Perchlorate-d18	1429030	7.515	2047316	70	50 - 150	
Calibration Check (7B05408-CCV2)		Lab File ID: PERC000022.D.Report.TXT			Analyzed: 02/23/17 20:02	
Perchlorate-d18	1850400	8.465	2047316	90	50 - 150	
Low Cal Check (7B05408-LCV2)		Lab File ID: PERC000023.D.Report.TXT			Analyzed: 02/23/17 20:20	
Perchlorate-d18	2174110	8.827	2047316	106	50 - 150	
Calibration Check (7B05408-CCV3)		Lab File ID: PERC000036.D.Report.TXT			Analyzed: 02/24/17 00:26	
Perchlorate-d18	1900870	9.106	2047316	93	50 - 150	
Low Cal Check (7B05408-LCV3)		Lab File ID: PERC000037.D.Report.TXT			Analyzed: 02/24/17 00:45	
Perchlorate-d18	2030230	9.256	2047316	99	50 - 150	
Interference Check A (7B05408-IFA2)		Lab File ID: PERC000038.D.Report.TXT			Analyzed: 02/24/17 01:03	
Perchlorate-d18	1719310	7.786	2047316	84	50 - 150	
LH18/24-SP650-6417-Grab (1702196-01)		Lab File ID: PERC000040.D.Report.TXT			Analyzed: 02/24/17 01:41	
Perchlorate-d18	2163370	8.925	2047316	106	50 - 150	
Blank (7B23020-BLK1)		Lab File ID: PERC000041.D.Report.TXT			Analyzed: 02/24/17 02:00	
Perchlorate-d18	2311930	9.391	2047316	113	50 - 150	
LCS (7B23020-BS1)		Lab File ID: PERC000042.D.Report.TXT			Analyzed: 02/24/17 02:19	
Perchlorate-d18	2297450	9.395	2047316	112	50 - 150	
Calibration Check (7B05408-CCV4)		Lab File ID: PERC000052.D.Report.TXT			Analyzed: 02/24/17 05:27	
Perchlorate-d18	1863200	9.044	2047316	91	50 - 150	
Low Cal Check (7B05408-LCV4)		Lab File ID: PERC000053.D.Report.TXT			Analyzed: 02/24/17 05:46	
Perchlorate-d18	2020010	9.246	2047316	99	50 - 150	

INITIAL CALIBRATION DATA

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:39 5/21/16 12:44

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	0.2	0.7845944	0.5	0.7849415	1	0.783103	2	0.8192946	5	0.8473028	10	0.8833049
Perchlorate (101)	0.2		0.5		1		2		5		10	
Perchlorate (85)	0.2	0.334203	0.5	0.290602	1	0.275233	2	0.2750875	5	0.2714884	10	0.2777807

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	20	0.928708	50	0.9971742								
Perchlorate (101)	20		50									
Perchlorate (85)	20	0.2935408	50	0.3188878								

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Mean RF	RF RSD	Slope/QRA	Intercept/QR B	QR C	LR r/QRCOD	LIMIT	Q	Typ
Perchlorate	0.8535529	9.160918					20		A
Perchlorate (101)							20		A
Perchlorate (85)	0.2921029	7.869005					20		A

INITIAL CALIBRATION STANDARDS

SW6850

Laboratory:	Empirical Laboratories, LLC	SDG:	1702196
Client:	Microbac Laboratories, Inc.-Ohio Valley Division	Project:	Longhorn
Sequence:	6E14115	Instrument:	LCMS1
Calibration:	6144001		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
16D0528	Perchlorate Init Cal 0.2 ug/L	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
16D0529	Perchlorate Init Cal 0.5 ug/L	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
16D0530	Perchlorate Init Cal 1.0 ug/L	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
16D0531	Perchlorate Init Cal 2.0 ug/L	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
16D0532	Perchlorate Init Cal 5.0 ug/L	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
16D0533	Perchlorate Init Cal 10 ug/L	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
16D0534	Perchlorate Init Cal 20 ug/L	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
16D0536	Perchlorate Init Cal 50 ug/L	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44

INITIAL CALIBRATION CHECK

SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000014.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>6E14115</u>	Injection Date:	<u>05/21/16</u>
Lab Sample ID:	<u>6E14115-ICV1</u>	Injection Time:	<u>13:20</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Perchlorate	A	5.000	4.824	0.8535529	0.8235756		-3.5	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B05408</u>	Injection Date:	<u>02/23/17</u>
Lab Sample ID:	<u>7B05408-CCV1</u>	Injection Time:	<u>14:22</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.705	0.8535529	0.8032047		-5.9	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000022.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B05408</u>	Injection Date:	<u>02/23/17</u>
Lab Sample ID:	<u>7B05408-CCV2</u>	Injection Time:	<u>20:02</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.699	0.8535529	0.8021185		-6.0	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000036.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B05408</u>	Injection Date:	<u>02/24/17</u>
Lab Sample ID:	<u>7B05408-CCV3</u>	Injection Time:	<u>00:26</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.735	0.8535529	0.808272		-5.3	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702196</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000052.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B05408</u>	Injection Date:	<u>02/24/17</u>
Lab Sample ID:	<u>7B05408-CCV4</u>	Injection Time:	<u>05:27</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.732	0.8535529	0.8078843		-5.4	15

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702196**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05408-LCV1**Sequence:** 7B05408**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.011	1.1	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702196**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05408-LCV2**Sequence:** 7B05408**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.011	1.1	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702196**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05408-LCV3**Sequence:** 7B05408**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.025	2.5	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702196**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05408-LCV4**Sequence:** 7B05408**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.031	3.1	30.00

HOLDING TIME SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702196Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: Longhorn

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LH18/24-SP650-6417-Grab	02/22/17 10:00	02/23/17 09:50	02/23/17 13:30	1.15	28.00	02/24/17 01:41	1.65	28.00	

PREPARATION BENCH SHEET

7B23020

Empirical Laboratories, LLC

Printed: 2/27/2017 11:54:26AM

Instrument: LCMS1

Prepared using: GCLC - PERC_6850_W

(No Surrogate)

Matrix: Water

Lab Number	Cont ID	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1702196-01	A	LCMS_PERC_6850_Q5	02/23/2017	10.00	10.00					NA	Diluted 500x due to conductivity 2-23-17 KEP
7B23020-BLK1		LCMS_PERC_6850_Q5	02/23/2017	10.00	10.00					NA	
7B23020-BS1		LCMS_PERC_6850_Q5	02/23/2017	10.00	10.00	17A0609		20		NA	

Reagents Used:

Standard	Description
16J0607	Water HPLC GRADE

SEQUENCE TABLE:

```

=====
Line           : 1
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

Eluent ID 16E0510
16E0510

```

=====
Line           : 2
Location      : Vial 1
Sample Information :
Sample Name   : 6E14115-TUN1 16D0464
=====

```

```

=====
Line           : 3
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 4
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 5
Location      : Vial 91
Sample Information :
Sample Name   : 6E14115-CAL1 16D0529
=====

```

```

=====
Line           : 6
Location      : Vial 92
Sample Information :
Sample Name   : 6E14115-CAL2 16D0529
=====

```

```

=====
Line           : 7
Location      : Vial 93
Sample Information :
Sample Name   : 6E14115-CAL3 16D0530
=====

```

```

=====
Line           : 8
Location      : Vial 94
Sample Information :
Sample Name   : 6E14115-CAL4 16D0531
=====

```

Line : 9
Location : Vial 95
Sample Information :
Sample Name : 6E14115-CAL5 1600532

=====
Line : 10
Location : Vial 96
Sample Information :
Sample Name : 6E14115-CAL6 1600533

=====
Line : 11
Location : Vial 97
Sample Information :
Sample Name : 6E14115-CAL7 1600534

=====
Line : 12
Location : Vial 98
Sample Information :
Sample Name : 6E14115-CAL8 1600536

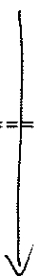
=====
Line : 13
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 14
Location : Vial 99
Sample Information :
Sample Name : 6E14115-ICV1 1600537

=====
Line : 15
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV1 NOT USING

=====
Line : 16
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV1

=====
Line : 17
Location : Vial 5
Sample Information :
Sample Name : 6E14115-IFAL



01671

```

=====
Line           : 18
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank NOT USING
=====

```

```

=====
Line           : 19
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 20
Location      : Vial 41
Sample Information :
Sample Name   : 1605063-01@100
=====

```

```

=====
Line           : 21
Location      : Vial 42
Sample Information :
Sample Name   : 1605063-02@100
=====

```

```

=====
Line           : 22
Location      : Vial 3
Sample Information :
Sample Name   : 6E14115-CCV2
=====

```

```

=====
Line           : 23
Location      : Vial 4
Sample Information :
Sample Name   : 6E14115-LCV2
=====

```

```

=====
Line           : 24
Location      : Vial 5
Sample Information :
Sample Name   : 6E-IFA1
=====

```

```

=====
Line           : 25
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 26
Location      : Vial 2
=====

```

SR 5-23-14

P1672

Sample Information :
Sample Name : Reagent Blank

=====
Line : 27
Location : Vial 51
Sample Information :
Sample Name : 6E-IFA2600

=====
Line : 28
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 29
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

SEQUENCE TABLE: eluent IDs: 17B0519, 17B0520

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7B05408-TUN1 17A0677
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : 7B05408-CCV1 17A0678
=====

=====
Line : 5
Location : Vial 4
Sample Information :
Sample Name : 7B05408-LCV1 17A0679
=====

=====
Line : 6
Location : Vial 5
Sample Information :
Sample Name : 7B05408-IFA1 16F0977
=====

=====
Line : 7
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 8
Location : Vial 6
Sample Information :
Sample Name : 7B23018-BLK1
=====

=====
Line : 9
Location : Vial 7
Sample Information :
Sample Name : 7B23018-BS1
=====

Handwritten signature

=====
Line : 10
Location : Vial 8
Sample Information :
Sample Name : 1702137-11 x |

=====
Line : 11
Location : Vial 9
Sample Information :
Sample Name : 1702137-12

=====
Line : 12
Location : Vial 10
Sample Information :
Sample Name : 1702137-13

=====
Line : 13
Location : Vial 11
Sample Information :
Sample Name : 7B23018-MS1

=====
Line : 14
Location : Vial 12
Sample Information :
Sample Name : 7B23018-MSD1

=====
Line : 15
Location : Vial 13
Sample Information :
Sample Name : 1702143-01

=====
Line : 16
Location : Vial 14
Sample Information :
Sample Name : 1702143-02

=====
Line : 17
Location : Vial 15
Sample Information :
Sample Name : 1702143-03

=====
Line : 18
Location : Vial 16
Sample Information :
Sample Name : 1702143-04
=====

Not OK

Location : Vial 17
Sample Information :
Sample Name : 1702143-05

X |

=====
Line : 20
Location : Vial 18
Sample Information :
Sample Name : 1702145-01
=====

=====
Line : 21
Location : Vial 19
Sample Information :
Sample Name : 1702152-01
=====

|
↓

=====
Line : 22
Location : Vial 3
Sample Information :
Sample Name : 7B05408-CCV2 17A0678
=====

=====
Line : 23
Location : Vial 4
Sample Information :
Sample Name : 7B05408-LCV2 17A0679
=====

=====
Line : 24
Location : Vial 20
Sample Information :
Sample Name : 1702152-02 X |
=====

=====
Line : 25
Location : Vial 21
Sample Information :
Sample Name : 1702152-03@2
=====

=====
Line : 26
Location : Vial 22
Sample Information :
Sample Name : 1702152-04 X |
=====

=====
Line : 27
Location : Vial 23
Sample Information :
Sample Name : 1702154-01
=====

|
↓

=====
Line : 28
Location : Vial 24
Sample Information : 7B23018-M52
1702196 REV01

Handwritten signature

=====
Line : 29
Location : Vial 25
Sample Information :
Sample Name : 7B23018-MSD2 x1
=====

=====
Line : 30
Location : Vial 26
Sample Information :
Sample Name : 1702154-02
=====

=====
Line : 31
Location : Vial 27
Sample Information :
Sample Name : 1702154-03
=====

=====
Line : 32
Location : Vial 28
Sample Information :
Sample Name : 1702154-04
=====

=====
Line : 33
Location : Vial 29
Sample Information :
Sample Name : 1702154-05
=====

=====
Line : 34
Location : Vial 30
Sample Information :
Sample Name : 1702154-06
=====

=====
Line : 35
Location : Vial 31
Sample Information :
Sample Name : 1702154-07
=====

=====
Line : 36
Location : Vial 3
Sample Information :
Sample Name : 7B05408-CCV3 17A0678
=====

=====
Line : 37
Location : Vial 4
Sample Information :
Sample Name : 7B05408-LCV3 17A0679
=====

[Handwritten signature]

Location : Vial 5
Sample Information :
Sample Name : 7B05408-IFA2 16E0477

=====
Line : 39
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 40
Location : Vial 32
Sample Information :
Sample Name : 1702196-01@500

=====
Line : 41
Location : Vial 33
Sample Information :
Sample Name : 7B23020-BLK1

=====
Line : 42
Location : Vial 34
Sample Information :
Sample Name : 7B23020-BS1

=====
Line : 43
Location : Vial 35
Sample Information :
Sample Name : 1702154-08 x1

=====
Line : 44
Location : Vial 36
Sample Information :
Sample Name : 7B23020-MS1

=====
Line : 45
Location : Vial 37
Sample Information :
Sample Name : 7B23020-MSD1

=====
Line : 46
Location : Vial 38
Sample Information :
Sample Name : 1702154-09

=====
Line : 47
Location : Vial 39
Sample Information : 1702154-10

Handwritten signature

=====
Line : 48
Location : Vial 40
Sample Information :
Sample Name : 1702154-11 X 1

=====
Line : 49
Location : Vial 41
Sample Information :
Sample Name : 1702154-12

=====
Line : 50
Location : Vial 42
Sample Information :
Sample Name : 1702154-13

=====
Line : 51
Location : Vial 43
Sample Information :
Sample Name : 1702154-14

=====
Line : 52
Location : Vial 3
Sample Information :
Sample Name : 7B05408-CCV4 17A0678

=====
Line : 53
Location : Vial 4
Sample Information :
Sample Name : 7B05408-LCV4 17A0679

=====
Line : 54
Location : Vial 44
Sample Information :
Sample Name : 1702128-04@2

=====
Line : 55
Location : Vial 45
Sample Information :
Sample Name : 7B21008-MS1@2

=====
Line : 56
Location : Vial 46
Sample Information :
Sample Name : 7B21008-MSD1@2

PhA-2017

Location : Vial 47
Sample Information :
Sample Name : 1702128-11@2

=====
Line : 58
Location : Vial 48
Sample Information :
Sample Name : 1702128-11@5

=====
Line : 59
Location : Vial 49
Sample Information :
Sample Name : 1702128-12@2

=====
Line : 60
Location : Vial 50
Sample Information :
Sample Name : 1702137-03@50

=====
Line : 61
Location : Vial 51
Sample Information :
Sample Name : 1702137-04@5

=====
Line : 62
Location : Vial 52
Sample Information :
Sample Name : 1702137-05@5

=====
Line : 63
Location : Vial 53
Sample Information :
Sample Name : 1702137-06@2

=====
Line : 64
Location : Vial 54
Sample Information :
Sample Name : 1702137-07@2

=====
Line : 65
Location : Vial 55
Sample Information :
Sample Name : 1702137-10@2

=====
Line : 66
Location : Vial 3
Sample Information : *7B05408-CCV5 17A0678*

14th 9th

=====
Line : 67
Location : Vial 4
Sample Information :
Sample Name : 7B05408-LCV5 17A0679
=====

=====
Line : 68
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

Sequence Summary Parameters:

One page header:	No
Print Configuration:	No
Print Sequence:	No
Print Logbook:	No
Print Method(s):	No
Print Analysis reports:	No
Print Statistics for Calib. runs:	No
Print Statistics for Sample runs:	No
Summary style:	Sample Summary

Perchlorate Analysis Evaluation

5/21/2016

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
Perchlorate 0.2 ug/L	65435.8	27872.8	2.3	2085020		9.707	9.729	0.998
Perchlorate 0.5 ug/L	162300	60086.9	2.7	2067670		9.733	9.741	0.999
Perchlorate 1.0 ug/L	327868	115234	2.8	2093390		9.679	9.699	0.998
Perchlorate 2.0 ug/L	670491	225125	3.0	2045940		9.729	9.751	0.998
Perchlorate 5.0 ug/L	1755730	562562	3.1	2072140		9.719	9.74	0.998
Perchlorate 10 ug/L	3646000	1146590	3.2	2063840		9.702	9.722	0.998
Perchlorate 20 ug/L	7550470	2386510	3.2	2032520		9.735	9.746	0.999
Perchlorate 50 ug/L	19125900	6116300	3.1	1918010		9.705	9.717	0.999
Perchlorate 5.0 ug/L ICV	1665970	536774	3.1	2022850	98.80	9.719	9.744	0.997
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
Average IS area of curve:	2047316							

83/85 Ratio Criteria 2.3-3.8
 RRT Criteria 0.98-1.02
 IS Recovery Criteria \pm 50% of Avg IS of curve

CAL Date 04/25/16

Perchlorate Analysis Evaluation

2/23/2017 Seq. ID #7B05408

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1702128-04	108099	0		1686170	82.36	8.639	8.7	0.993
1702128-11	7219450	2243970	3.217	1449580	70.804	7.738	7.778	0.995
1702128-12	0	0		1226500	59.908	6.7	6.744	0.993
1702137-03	4909450	1508230	3.255	2041130	99.698	9.062	9.09	0.997
1702137-04	4097260	1287330	3.183	1971940	96.318	8.673	8.707	0.996
1702137-05	4904510	1516330	3.234	1880780	91.866	8.474	8.494	0.998
1702137-06	96629.2	0		1542570	75.346	7.344	7.415	0.99
1702137-07	47924.5	0		1613950	78.832	8.277	8.237	1.005
1702137-10	7755960	2424700	3.199	1549240	75.672	7.912	7.933	0.997
1702137-13	65298.8	0		1079690	52.737	6.479	6.578	0.985
1702143-01	0	0		1845230	90.129	8.45	8.45	1
1702143-02	0	0		1912960	93.437	8.45	8.559	0.987
1702143-03	0	0		1933940	94.462	8.45	8.571	0.986
1702143-04	85631.4	34159.6	2.507	2035500	99.423	8.96	8.984	0.997
1702143-05	138496	50050.6	2.767	2073360	101.272	8.962	9.013	0.994
1702145-01	0	48227	0	1759050	85.92	7.6	7.638	0.995
1702154-01	875376	305201	2.868	1111090	54.271	6.739	6.764	0.996
1702154-02	1473840	501154	2.941	1225970	59.882	6.737	6.77	0.995
1702154-03	4315410	1368520	3.153	1189040	58.078	6.694	6.75	0.992
1702154-04	8775520	2761280	3.178	1187240	57.99	6.671	6.718	0.993
1702154-05	22709.5	0		1153820	56.358	6.639	6.701	0.991
1702154-11	2114260	720356	2.935	1229600	60.059	7.157	7.192	0.995
1702154-14	2925300	978499	2.99	1139420	55.654	6.604	6.632	0.996
1702196-01	383590	141896	2.703	2163370	105.669	8.912	8.925	0.999
7B05408-CCV1	1862680	599468	3.107	2319060	113.273	9.233	9.261	0.997
7B05408-CCV2	1484240	490026	3.029	1850400	90.382	8.437	8.465	0.997
7B05408-CCV3	1536420	500600	3.069	1900870	92.847	9.078	9.106	0.997
7B05408-CCV4	1505250	492525	3.056	1863200	91.007	9.016	9.044	0.997
7B05408-CCV5	1602340	527733	3.036	2009540	98.155	8.98	9.015	0.996
7B05408-IFA1	483765	165800	2.918	1429030	69.8	7.479	7.515	0.995
7B05408-IFA2	591411	217592	2.718	1719310	83.979	7.752	7.786	0.996
7B05408-LCV1	403637	143604	2.811	2338540	114.225	9.218	9.239	0.998
7B05408-LCV2	375280	122294	3.069	2174110	106.193	8.804	8.827	0.997
7B05408-LCV3	355167	131431	2.702	2030230	99.165	9.213	9.256	0.995
7B05408-LCV4	355693	131907	2.697	2020010	98.666	9.217	9.246	0.997
7B05408-LCV5	367952	133538	2.755	2131920	104.132	9.088	9.117	0.997

7B21008-MS1	370249	142781		1663060	81.231	8.454	8.541	0.99
7B21008-MSD1	369933	140315		1588120	77.571	8.247	8.292	0.995
7B23018-BLK1	0			2369140	115.719	9.3	9.315	0.998
7B23018-BS1	772870	260184	2.97	2358890	115.219	9.306	9.331	0.997
7B23018-MS1	485007	184004	2.635	1096680	53.567	6.443	6.49	0.993
7B23018-MS2	1357760	443309	3.063	1206960	58.953	6.732	6.774	0.994
7B23018-MSD1	481737	199484	2.415	1116180	54.519	6.439	6.467	0.996
7B23018-MSD2	1382860	465628	2.7	1252150	61.161	6.742	6.784	0.994
7B23020-BLK1	0			2311930	112.925	9.4	9.391	1.001
7B23020-BS1	731159	251853	2.903	2297450	112.218	9.37	9.395	0.997
Average IS area of curve:	2047316.25							

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

**ANALYTICAL DATA PACKAGE**

SDG # 1702204

PROJECT NAME: Longhorn**SUBMITTAL TO:**

Adriane Steed

Microbac Laboratories, Inc.

158 Starlite Drive

Marietta, OH 45750

SUBMITTAL BY:

Empirical Laboratories, LLC (EL)

621 Mainstream Drive, Suite 270

Nashville, TN 37228

Tel (615)345-1115

Fax (866)417-0548

LABORATORY CONTACT PERSON:

Project Manager: Sonya Gordon

Tel (615)345-1115

Fax (866)417-0548

Email: sgordon@empirlabs.com

Original Report Date: March 20, 2017

Report Revision #: N/A

Revision Date: N/A

THIS DOCUMENT MEETS DoD QSM 5.0 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Data Review Manager, Ms. Amy Barnett, is responsible for the final data produced and reported. Her signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

L-A-B Accredited - Certificate Number L2226 - Testing

Table of Contents

#	Description
1	Cover Page
2	Table of Contents
3	Case Narrative
4	Sample Receipt Information Chain of Custody Forms Sample Receipt Confirmations WorkOrder Summary Sample Delivery Group (SDG) Sheets
5	Data for Perchlorate Required Data / QAQC / Calibration Forms Supporting Raw Data / Logs

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

This is an original submittal of the final report package.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

Perchlorate:

No anomalies or deviations are noted.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- DL:** The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 5.0 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 5.0 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** Exceeding quality control criteria are associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.
- H:** The result was analyzed, extracted, or received outside of the EPA recommended holding time.
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte and that the analyte's DL/LOD/LOQ have been raised.

- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported. If there is greater than a 100% difference indicated on the form 10, the lower of the two values is reported.
- Q:** The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Calibration Verification, internal standard, Blank Spike and/or Blank Spike Duplicate.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or co-elution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.
- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase

incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Ms. Amy M. Barnett
Data Review Manager

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 01/18/2017)

00841888

DoD ELAP QSM5.0, Certificate Number L2226

- Aqueous
- Non-aqueous
- Expires: 11/30/2018

State of Florida, Department of Health – NELAP Primary, Lab ID: E87646

- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2017

State of Georgia, Environmental Protection Agency – NELAP, Self Certification

- Expires: 06/30/2017

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017

- Wastewater
- Expires: 12/31/2017

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77

- Aqueous
- Non-aqueous
- Expires: 06/30/2017

State of New Jersey, Department of Environmental Protection – NELAP, Lab ID: TN473

- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2017

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-16-14

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Utah, Department of Health – NELAP, Certificate Number: TN0042016-8

- Aqueous
- Non-aqueous
- Expires: 07/31/2017

**Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 8924,
Lab ID: 460243**

- Aqueous
- Non-aqueous
- Expires: 12/14/2017

State of Washington, Department of Ecology – NELAP, Lab ID: C934-16

- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2017

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg)} * \text{Expected Vol/Weight (mL or g)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL)} * \text{Final Vol (ml)} * \text{Dilution} * (1000\text{uL/mL})}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL)} * \text{Final Vol (mL)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Sample Receipt Information



1702204-01 A

CHAIN OF CUSTODY

MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Page 1 of 1

Project: AECOM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Job: **GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES**

Project No. 60256135.GWTP HRUMART6

Prepared By: **Scott Beesinger**

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. of Containers	SILVER & SELENIUM	PERCHLORATE METHOD 6850	HEXAVALENT CHROMIUM	Analyses	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140-7418-Grab	Water	02/22/17 / 10:00		1	X				HNO3	
LH18/24-SP140-7418-Grab	Water	02/22/17 / 10:00		2		X	X		NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By: *[Signature]* Date: 02/22/17 Time: 15:00 Received By: *[Signature]* Date: Time Received By: Date Time

Received At Lab By: *[Signature]* Date: 2/22/17 Time: 15:00

For Lab Use Only
Operated By: *[Signature]* Date: Time Temp of Container Seal No. Condition

Remarks:

Microbac OVD
Received: 02/23/2017 09:39
By: BRENDA GREGORY

Brenda Gregory

SUB-CONTRACTED ANALYSES

Shipped To: Empirical Labs

L#: _____

621 Mainstream Dr #270
Nashville, TN 37228

From: Microbac Laboratories Inc.
158 Starlite Park
Marietta, OH 45750
(740) 373-4071

Shipped Via: fed ex

Report To: Adriane Steed

P.O. #: _____

TAT Required: _____

See Chain of Custody for ID's, date and time collected.

Microbac Workorder Number	Number of Samples	Analyses
L17021204	01	6850

Level: 1 2 3 4

Internal COC: YES / NO

Relinquished By <u>Brenda Gregory</u>	Date/Time <u>2/23/17 9:400</u>	Comments
Received By	Date/Time	Cooler Temp

Form 7-1
Revised 07/18/11

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 2/24/17@0845

Work-order# 1702204

- 1. Tracking # 3808 (last 4 digits, FedEx)
Courier: Fedex
- 2. Temperature of rep. sample or temp blank when opened: 1.16 °C + correction factor (-0.1) = 1.5 °C
(Temp Fluke#1 SN17680086)
- 3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA
- 4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: (front)
- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 2/24/17

- 7. Were custody seals on containers: YES NO and Intact YES...NO...NA
Were these signed and dated correctly? YES...NO...NA
- 8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc.)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13. a. Were VOA vials received? YES NO...NA
- b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA
- 14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 2/24/17

- 15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA
- b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA
- 16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documented? YES...NO...NA
- 17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documented? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) TH 2/24/17

- 18. Were custody papers properly filled out (ink, signed, etc.)? YES...NO...NA
- 19. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 20. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA
- 21. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA
- 22. Were there Non-Conformance issues at login? YES...NO...NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) TH 2/24/17
I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) TH 2/24/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 2/24/17



Empirical Laboratories, LLC

WORK ORDER

1702204

Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn	Project Manager: Sonya Gordon Project Number: MIC_Perc
---	---

Report To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone: (740) 373-4071
 Fax: (740) 373-4835

Invoice To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Stephanie Mossburg
 158 Starlite Drive
 Marietta, OH 45750
 Phone : (740) 373-4071
 Fax: (740) 373-4835

Date Due: 03/10/2017 16:00 (10 day TAT)

Date Received: 02/24/2017 08:45

Logged In By: Tiana L. Hutchings

Received By: Tiana L. Hutchings

Samples Received at: 1.5°C					
Custody seals on the o	Yes	Samples received on i	Yes	Any headspace in vials	No
All containers in good	Yes	Custody seals intact?	Yes	Trip blank received?	No
Did the containers mat	Yes	Proper packing materi	Yes	Cyanide Effluent samp	No
Preserved containers a	No	VOA vials received?	No	608 Pest/PCB sample:	No

Analysis	TAT	Expires	Version	Comments
1702204-01 LH18/24-SP140-7418-Grab [Water] Sampled 02/22/2017				
10:00 (GMT-06:00) Central Time (US & Canada)				
LCMS_PERC_6850_Q5	10	03/22/2017 10:00		

Sample Delivery Group Assignment Form

CLIENT: Microbac Laboratories, Inc.-Ohio Valley Division
PROJECT NAME: Longhorn
SDG #: 1702204

QC LEVEL: Level IV
Report Due: 3/10/2017
Client Sample Count: 1

Sample Type	Sampled	Received	Lab ID	Client ID	Lab Matrix	SW6850
Client Sample	2/22/2017	2/24/2017	1702204-01	LH18/24-SP140-7418-Grab	Water	X

Forms For Perchlorates

Sample Extraction Data

Prep Method: PERC_6850_W-SW6850

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [mL]	Final [mL]	Dilution	% Solids	Notes	Date
1702204-01 [LH18/24-SP140-7418-Grab]	7B28010	10.00/10.00	10.0	10.0	200.00			02/28/17

ANALYSIS DATA SHEET

LH18/24-SP140-7418-Grab

Laboratory: Empirical Laboratories, LLC SDG: 1702204
 Client: Microbac Laboratories, Inc.-Ohio Vall Project: Longhorn
 Matrix: Water Laboratory ID: 1702204-01 File ID: PERC000012.D.Report.TXT
 Sampled: 02/22/17 10:00 Prepared: 02/28/17 13:22 Analyzed: 03/17/17 13:17
 Solids: Preparation: PERC 6850 W Dilution: 200
 Batch: 7B28010 Sequence: 7C07604 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	2680	100	200	400	D

Total Target Analytes Reported 1 Project Analytes: 1

LCS / LCS DUPLICATE RECOVERY
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702204</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Matrix:	<u>Water</u>		
Batch:	<u>7B28010</u>	Laboratory ID:	<u>7B28010-BS1</u>
Preparation:	<u>PERC_6850_W</u>	Initial/Final:	<u>10 mL / 10 mL</u>

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Perchlorate	2.000	1.850	92.5	84 - 119

PREPARATION BATCH SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1702204
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Batch: 7B28010 Batch Matrix: Water Preparation: PERC_6850_W

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
LH18/24-SP140-7418-Grab	1702204-01	02/28/17 13:22	10.00	10.00
Blank	7B28010-BLK1	02/28/17 13:22	10.00	10.00
LCS	7B28010-BS1	02/28/17 13:22	10.00	10.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: 1702204
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7B28010-BLK1 File ID: PERC000008.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/28/17 18:27
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7B28010 Sequence: 7B05916 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		0.500	1.00	2.00	U

Total Target Analytes Reported: 1

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1702204
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7B28010-BS1 File ID: PERC000009.D.Report.TXT
 Sampled: Prepared: Analyzed: 02/28/17 18:46
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7B28010 Sequence: 7B05916 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	1.850	0.500	1.00	2.00	J

Total Target Analytes Reported: 1

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW6850

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1702204</u>
Client: <u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project: <u>Longhorn</u>
Lab File ID: <u>PERC000002.D.Report.TXT</u>	Injection Date: <u>05/21/16</u>
Instrument ID: <u>LCMS1</u>	Injection Time: <u>09:46</u>
Sequence: <u>6E14115</u>	Lab Sample ID: <u>6E14115-TUN1</u>

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1702204
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 02/28/17
Instrument ID: LCMS1 Injection Time: 16:34
Sequence: 7B05916 Lab Sample ID: 7B05916-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1702204
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 03/17/17
Instrument ID: LCMS1 Injection Time: 10:08
Sequence: 7C07604 Lab Sample ID: 7C07604-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7B05916

Lab Sample ID	Analyte	True	Found	%R	Units
7B05916-IFA1	Perchlorate-d18	5.000	5.00	60.4	ug/L
	Perchlorate	2.000	2.00	100	ug/L

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7C07604

Lab Sample ID	Analyte	True	Found	%R	Units
7C07604-IFA1	Perchlorate-d18	5.000	5.00	67.6	ug/L
	Perchlorate	2.000	1.86	93.2	ug/L

INITIAL CALIBRATION DATA

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:39 5/21/16 12:44

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	0.2	0.7845944	0.5	0.7849415	1	0.783103	2	0.8192946	5	0.8473028	10	0.8833049
Perchlorate (101)	0.2		0.5		1		2		5		10	
Perchlorate (85)	0.2	0.334203	0.5	0.290602	1	0.275233	2	0.2750875	5	0.2714884	10	0.2777807

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	20	0.928708	50	0.9971742								
Perchlorate (101)	20		50									
Perchlorate (85)	20	0.2935408	50	0.3188878								

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Mean RF	RF RSD	Slope/QRA	Intercept/QR B	QR C	LR r/QRCOD	LIMIT	Q	Typ
Perchlorate	0.8535529	9.160918					20		A
Perchlorate (101)							20		A
Perchlorate (85)	0.2921029	7.869005					20		A

INITIAL CALIBRATION STANDARDS

SW6850

Laboratory:	Empirical Laboratories, LLC	SDG:	1702204
Client:	Microbac Laboratories, Inc.-Ohio Valley Division	Project:	Longhorn
Sequence:	6E14115	Instrument:	LCMS1
Calibration:	6144001		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
16D0528	Perchlorate Init Cal 0.2 ug/L	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
16D0529	Perchlorate Init Cal 0.5 ug/L	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
16D0530	Perchlorate Init Cal 1.0 ug/L	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
16D0531	Perchlorate Init Cal 2.0 ug/L	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
16D0532	Perchlorate Init Cal 5.0 ug/L	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
16D0533	Perchlorate Init Cal 10 ug/L	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
16D0534	Perchlorate Init Cal 20 ug/L	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
16D0536	Perchlorate Init Cal 50 ug/L	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44

INITIAL CALIBRATION CHECK

SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702204</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000014.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>6E14115</u>	Injection Date:	<u>05/21/16</u>
Lab Sample ID:	<u>6E14115-ICV1</u>	Injection Time:	<u>13:20</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Perchlorate	A	5.000	4.824	0.8535529	0.8235756		-3.5	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1702204
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Instrument ID: LCMS1 Calibration: 6144001
Lab File ID: PERC000004.D.Report.TXT Calibration Date: 05/21/16 00:00
Sequence: 7B05916 Injection Date: 02/28/17
Lab Sample ID: 7B05916-CCV1 Injection Time: 17:11

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.700	0.8535529	0.8024164		-6.0	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702204</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000022.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7B05916</u>	Injection Date:	<u>02/28/17</u>
Lab Sample ID:	<u>7B05916-CCV2</u>	Injection Time:	<u>22:51</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.716	0.8535529	0.8051166		-5.7	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702204</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV1</u>	Injection Time:	<u>10:46</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.646	0.8535529	0.7931741		-7.1	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1702204</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000023.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV2</u>	Injection Time:	<u>16:44</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.666	0.8535529	0.7965014		-6.7	15

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702204**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05916-LCV1**Sequence:** 7B05916**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9918	-0.8	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702204**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7B05916-LCV2**Sequence:** 7B05916**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.017	1.7	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702204**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV1**Sequence:** 7C07604**Standard ID:** 17C0170

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9923	-0.8	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1702204**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV2**Sequence:** 7C07604**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9837	-1.6	30.00

HOLDING TIME SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1702204Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: Longhorn

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LH18/24-SP140-7418-Grab	02/22/17 10:00	02/24/17 08:45	02/28/17 13:22	6.14	28.00	03/17/17 13:17	23.14	28.00	

PREPARATION BENCH SHEET

7B28010

Empirical Laboratories, LLC

Printed: 3/20/2017 12:21:50PM

Instrument: LCMS1

Prepared using: GCLC - PERC_6850_W

(No Surrogate)

Matrix: Water

Lab Number	Cont ID	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1702204-01	A	LCMS_PERC_6850_Q5	02/28/2017	10.00	10.00					NA	Diluted 10x due to conductivity KEP 2-28-17
7B28010-BLK1		LCMS_PERC_6850_Q5	02/28/2017	10.00	10.00					NA	
7B28010-BS1		LCMS_PERC_6850_Q5	02/28/2017	10.00	10.00	17A0609		20		NA	

Reagents Used:

Standard	Description
16J0607	Water HPLC GRADE

SEQUENCE TABLE:

```

=====
Line           : 1
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

Eluent ID 16E0510
16E0510

```

=====
Line           : 2
Location      : Vial 1
Sample Information :
Sample Name   : 6E14115-TUN1 16D0464
=====

```

```

=====
Line           : 3
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 4
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 5
Location      : Vial 91
Sample Information :
Sample Name   : 6E14115-CAL1 16D0529
=====

```

```

=====
Line           : 6
Location      : Vial 92
Sample Information :
Sample Name   : 6E14115-CAL2 16D0529
=====

```

```

=====
Line           : 7
Location      : Vial 93
Sample Information :
Sample Name   : 6E14115-CAL3 16D0530
=====

```

```

=====
Line           : 8
Location      : Vial 94
Sample Information :
Sample Name   : 6E14115-CAL4 16D0531
=====

```

Line : 9
Location : Vial 95
Sample Information :
Sample Name : 6E14115-CAL5 1600532

=====
Line : 10
Location : Vial 96
Sample Information :
Sample Name : 6E14115-CAL6 1600533

=====
Line : 11
Location : Vial 97
Sample Information :
Sample Name : 6E14115-CAL7 1600534

=====
Line : 12
Location : Vial 98
Sample Information :
Sample Name : 6E14115-CAL8 1600536

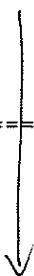
=====
Line : 13
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 14
Location : Vial 99
Sample Information :
Sample Name : 6E14115-ICV1 1600537

=====
Line : 15
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV1 NOT USING

=====
Line : 16
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV1

=====
Line : 17
Location : Vial 5
Sample Information :
Sample Name : 6E14115-IFAL



01671

```

=====
Line           : 18
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank NOT USING
=====

```

```

=====
Line           : 19
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 20
Location      : Vial 41
Sample Information :
Sample Name   : 1605063-01@100
=====

```

```

=====
Line           : 21
Location      : Vial 42
Sample Information :
Sample Name   : 1605063-02@100
=====

```

```

=====
Line           : 22
Location      : Vial 3
Sample Information :
Sample Name   : 6E14115-CCV2
=====

```

```

=====
Line           : 23
Location      : Vial 4
Sample Information :
Sample Name   : 6E14115-LCV2
=====

```

```

=====
Line           : 24
Location      : Vial 5
Sample Information :
Sample Name   : 6E-IFA1
=====

```

```

=====
Line           : 25
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 26
Location      : Vial 2
=====

```

SR 5-23-14

P1672

Sample Information :
Sample Name : Reagent Blank

=====
Line : 27
Location : Vial 51
Sample Information :
Sample Name : 6E-IFA2600

=====
Line : 28
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 29
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

00841932
2-29-17
76H09

SEQUENCE TABLE: eluent IDs: 17B0683, 17B0684

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7B05916-TUN1 17A0677
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : 7B05916-CCV1 17A0678
=====

=====
Line : 5
Location : Vial 4
Sample Information :
Sample Name : 7B05916-LCV1 17A0679
=====

=====
Line : 6
Location : Vial 5
Sample Information :
Sample Name : 7B05916-IFA1 16F0477
=====

=====
Line : 7
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 8
Location : Vial 6
Sample Information :
Sample Name : 7B28010-BLK1
=====

=====
Line : 9
Location : Vial 7
Sample Information :
Sample Name : 7B28010-BS1
=====

Handwritten signature

=====
Line : 10
Location : Vial 8
Sample Information :
Sample Name : 1702166-01 x1
=====

=====
Line : 11
Location : Vial 9
Sample Information :
Sample Name : 1702166-04
=====

=====
Line : 12
Location : Vial 10
Sample Information :
Sample Name : 1702166-05
=====

=====
Line : 13
Location : Vial 11
Sample Information :
Sample Name : 7B28010-MS1
=====

=====
Line : 14
Location : Vial 12
Sample Information :
Sample Name : 7B28010-MSD1
=====

=====
Line : 15
Location : Vial 13
Sample Information :
Sample Name : 1702171-01
=====

=====
Line : 16
Location : Vial 14
Sample Information :
Sample Name : 1702171-02
=====

=====
Line : 17
Location : Vial 15
Sample Information :
Sample Name : 1702171-03
=====

=====
Line : 18
Location : Vial 16
Sample Information :
Sample Name : 1702171-04 ✓
=====

00841934
1444
2-29-17
[Signature]

Location : Vial 17
Sample Information :
Sample Name : 1702171-05 *x1*

=====
Line : 20
Location : Vial 18
Sample Information :
Sample Name : 1702171-06

=====
Line : 21
Location : Vial 19
Sample Information :
Sample Name : 1702171-07

=====
Line : 22
Location : Vial 3
Sample Information :
Sample Name : 7B05916-CCV2 *17A0678*

=====
Line : 23
Location : Vial 4
Sample Information :
Sample Name : 7B05916-LCV2 *17A0679*

=====
Line : 24
Location : Vial 20
Sample Information :
Sample Name : 1702180-01 *x1*

=====
Line : 25
Location : Vial 21
Sample Information :
Sample Name : 1702181-01

=====
Line : 26
Location : Vial 22
Sample Information :
Sample Name : 1702182-01

=====
Line : 27
Location : Vial 23
Sample Information :
Sample Name : 1702184-02

=====
Line : 28
Location : Vial 24
Sample Information : *1702198-01*
1702204

764 5/11

=====
Line : 29
Location : Vial 25
Sample Information :
Sample Name : 1702198-02 X 1

=====
Line : 30
Location : Vial 26
Sample Information :
Sample Name : 1702198-03

=====
Line : 31
Location : Vial 27
Sample Information :
Sample Name : 1702198-04

=====
Line : 32
Location : Vial 28
Sample Information :
Sample Name : 1702204-01@10

=====
Line : 33
Location : Vial 29
Sample Information :
Sample Name : 1702209-01 X 1

=====
Line : 34
Location : Vial 3
Sample Information :
Sample Name : 7B05916-CCV3 17 A06 78

=====
Line : 35
Location : Vial 4
Sample Information :
Sample Name : 7B05916-LCV3 17 A06 79

=====
Line : 36
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

Sequence Summary Parameters:

One page header: No
Print Configuration: No
Print Sequence: No
Print Logbook: No

3-20-17
Mitt 9/11

SEQUENCE TABLE: *eluent IDs: 17C0319, 17C0320*

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7C07604-TUN1 *17A0677*
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 5
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 6
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 7
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV1 *17A0679*
=====

=====
Line : 8
Location : Vial 5
Sample Information :
Sample Name : 7C07604-IFA1 *16F0977*
=====

Line : 9
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 10
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 11
Location : Vial 6
Sample Information :
Sample Name : 1703035-01@20

=====
Line : 12
Location : Vial 7
Sample Information :
Sample Name : 1702204-01@200

=====
Line : 13
Location : Vial 8
Sample Information :
Sample Name : 1702155-02@5

=====
Line : 14
Location : Vial 9
Sample Information :
Sample Name : 1703001-02@10

=====
Line : 15
Location : Vial 10
Sample Information :
Sample Name : 7C10018-BLK1

=====
Line : 16
Location : Vial 11
Sample Information :
Sample Name : 7C10018-BS1

=====
Line : 17
Location : Vial 12
Sample Information :
Sample Name : 1702102-07 X1

3-20-17

Handwritten signature

=====
 Line : 18
 Location : Vial 13
 Sample Information :
 Sample Name : 1703067-02 *ix*

=====
 Line : 19
 Location : Vial 14
 Sample Information :
 Sample Name : 1703067-03

=====
 Line : 20
 Location : Vial 15
 Sample Information :
 Sample Name : 1703081-15

=====
 Line : 21
 Location : Vial 16
 Sample Information :
 Sample Name : 1703081-16

=====
 Line : 22
 Location : Vial 17
 Sample Information :
 Sample Name : 1703081-17

=====
 Line : 23
 Location : Vial 3
 Sample Information :
 Sample Name : 7C07604-CCV2 *17C0169*

=====
 Line : 24
 Location : Vial 4
 Sample Information :
 Sample Name : 7C07604-LCV2 *17A0679*

=====
 Line : 25
 Location : Vial 18
 Sample Information :
 Sample Name : 1703081-18 *ix*

=====
 Line : 26
 Location : Vial 19
1703081-19

3-20-17
170204

Sample Information :
Sample Name : 1703081-19

1x

=====
Line : 27
Location : Vial 20
Sample Information :
Sample Name : 1703081-25
=====

=====
Line : 28
Location : Vial 21
Sample Information :
Sample Name : 1703081-27
=====

=====
Line : 29
Location : Vial 22
Sample Information :
Sample Name : 1703081-29
=====

=====
Line : 30
Location : Vial 23
Sample Information :
Sample Name : 1703081-31
=====

✓

=====
Line : 31
Location : Vial 24
Sample Information :
Sample Name : 1703094-01@10
=====

=====
Line : 32
Location : Vial 25
Sample Information :
Sample Name : 1703098-02
=====

1x

=====
Line : 33
Location : Vial 26
Sample Information :
Sample Name : 7C10018-MS1
=====

=====
Line : 34
Location : Vial 27
Sample Information :
Sample Name : 7C10018-MSD1
=====

✓

3-20-17
Avt

Line : 35
Location : Vial 28
Sample Information :
Sample Name : 1703098-22

lx
↓

Line : 36
Location : Vial 29
Sample Information :
Sample Name : 1703098-23

Line : 37
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV3 17C0169

Line : 38
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV3 17A0679

Line : 39
Location : Vial 30
Sample Information :
Sample Name : 1702102-07@5

Line : 40
Location : Vial 31
Sample Information :
Sample Name : 1703067-02@5

Line : 41
Location : Vial 32
Sample Information :
Sample Name : 1703067-03@5

Line : 42
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV4 17C0169

Line : 43
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV4 17A0679

100 mg

=====
Line : 44
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 45
Location : Vial 33
Sample Information :
Sample Name : 7C15019-BLK1
=====

=====
Line : 46
Location : Vial 34
Sample Information :
Sample Name : 7C15019-BS1
=====

=====
Line : 47
Location : Vial 35
Sample Information :
Sample Name : 1703085-01 *(x)*
=====

=====
Line : 48
Location : Vial 36
Sample Information :
Sample Name : 7C15019-MS1
=====

=====
Line : 49
Location : Vial 37
Sample Information :
Sample Name : 7C15019-MSD1
=====

=====
Line : 50
Location : Vial 38
Sample Information :
Sample Name : 1703085-02
=====

=====
Line : 51
Location : Vial 39
Sample Information :
Sample Name : 1703110-01
=====

=====
Line : 52
Location : Vial 40
1703110-02
=====

3-20-17
JTT

Sample Information :
Sample Name : 1703110-02 1x

=====
Line : 53
Location : Vial 41
Sample Information :
Sample Name : 1703110-03

=====
Line : 54
Location : Vial 42
Sample Information :
Sample Name : 1703110-04

=====
Line : 55
Location : Vial 43
Sample Information :
Sample Name : 1703110-05

=====
Line : 56
Location : Vial 44
Sample Information :
Sample Name : 1703110-06

=====
Line : 57
Location : Vial 45
Sample Information :
Sample Name : 1703110-07

=====
Line : 58
Location : Vial 46
Sample Information :
Sample Name : 1703110-08

=====
Line : 59
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV5 17C0169

=====
Line : 60
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV5 17A0679

LCMS-1 \ 6850

3-20-17

Handwritten signature

Line : 61
Location : Vial 47
Sample Information :
Sample Name : 1703110-09

ix

=====
Line : 62
Location : Vial 48
Sample Information :
Sample Name : 1703110-10

=====
Line : 63
Location : Vial 49
Sample Information :
Sample Name : 1703110-11

v

=====
Line : 64
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV6 17C0169

=====
Line : 65
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV6 17A0679

=====
Line : 66
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 67
Location : Vial 50
Sample Information :
Sample Name : 7C17011-BLK1

=====
Line : 68
Location : Vial 51
Sample Information :
Sample Name : 7C17011-BS1

=====
Line : 69
Location : Vial 52
Sample Information :
Sample Name : 1703092-01

ix

LCMS-1\6850

3-20-17

[Handwritten signature]

=====
 Line : 70
 Location : Vial 53
 Sample Information :
 Sample Name : 7C17011-MS1 |x
 =====

=====
 Line : 71
 Location : Vial 54
 Sample Information :
 Sample Name : 7C17011-MSD1
 =====

=====
 Line : 72
 Location : Vial 55
 Sample Information :
 Sample Name : 1703093-02
 =====

=====
 Line : 73
 Location : Vial 56
 Sample Information :
 Sample Name : 1703093-03
 =====

=====
 Line : 74
 Location : Vial 57
 Sample Information :
 Sample Name : 1703093-04
 =====

=====
 Line : 75
 Location : Vial 58
 Sample Information :
 Sample Name : 1703104-01
 =====

=====
 Line : 76
 Location : Vial 59
 Sample Information :
 Sample Name : 1703104-03
 =====

=====
 Line : 77
 Location : Vial 60
 Sample Information :
 Sample Name : 1703104-05
 =====

=====
 Line : 78
 Location : Vial 61
 1703104-07
 =====

[Handwritten signature]

Sample Information :
Sample Name : 1703104-07

IX

=====
Line : 79
Location : Vial 62
Sample Information :
Sample Name : 1703104-10

=====
Line : 80
Location : Vial 63
Sample Information :
Sample Name : 1703104-11

↓

=====
Line : 81
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV7 17C0169

=====
Line : 82
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV7 17A0679

=====
Line : 83
Location : Vial 64
Sample Information :
Sample Name : 1703104-12

IX

=====
Line : 84
Location : Vial 65
Sample Information :
Sample Name : 1703104-13

=====
Line : 85
Location : Vial 66
Sample Information :
Sample Name : 1703105-01

=====
Line : 86
Location : Vial 67
Sample Information :
Sample Name : 1703106-14

↓

3-20-17
[Signature]

Line : 87
Location : Vial 68
Sample Information :
Sample Name : 1703107-01

lx

=====
Line : 88
Location : Vial 69
Sample Information :
Sample Name : 1703124-02

=====
Line : 89
Location : Vial 70
Sample Information :
Sample Name : 1703124-03

=====
Line : 90
Location : Vial 71
Sample Information :
Sample Name : 1703124-04

=====
Line : 91
Location : Vial 72
Sample Information :
Sample Name : 1703151-02

=====
Line : 92
Location : Vial 73
Sample Information :
Sample Name : 1703151-03

=====
Line : 93
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV8 *17C0679*

=====
Line : 94
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV8 *17A0679*

=====
Line : 95
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

Perchlorate Analysis Evaluation

5/21/2016

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
Perchlorate 0.2 ug/L	65435.8	27872.8	2.3	2085020		9.707	9.729	0.998
Perchlorate 0.5 ug/L	162300	60086.9	2.7	2067670		9.733	9.741	0.999
Perchlorate 1.0 ug/L	327868	115234	2.8	2093390		9.679	9.699	0.998
Perchlorate 2.0 ug/L	670491	225125	3.0	2045940		9.729	9.751	0.998
Perchlorate 5.0 ug/L	1755730	562562	3.1	2072140		9.719	9.74	0.998
Perchlorate 10 ug/L	3646000	1146590	3.2	2063840		9.702	9.722	0.998
Perchlorate 20 ug/L	7550470	2386510	3.2	2032520		9.735	9.746	0.999
Perchlorate 50 ug/L	19125900	6116300	3.1	1918010		9.705	9.717	0.999
Perchlorate 5.0 ug/L ICV	1665970	536774	3.1	2022850	98.80	9.719	9.744	0.997
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
Average IS area of curve:	2047316							

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria \pm 50% of Avg IS of curve

CAL Date 04/25/16

Perchlorate Analysis Evaluation

2/28/2017 Seq. ID #7B05916

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1702166-05	0	0		1358930	66.376	6.5	6.599	0.985
1702171-04	2990520	961798	3.109	1026150	50.122	6.375	6.419	0.993
1702171-05	2511600	814609	3.083	1106710	54.057	6.347	6.381	0.995
1702171-06	0	0		1069220	52.225	6.3	6.38	0.987
1702171-07	1832880	636207	2.881	1208140	59.011	6.565	6.591	0.996
1702182-01	72763.3	0		1933230	94.428	8.143	8.193	0.994
1702184-02	0	0		2217680	108.321	9	8.964	1.004
1702198-02	1700200	592598	2.869	1224440	59.807	6.564	6.587	0.997
1702198-04	800151	281092	2.847	1084660	52.98	6.472	6.508	0.994
1702209-01	37396.6	0		1232180	60.185	6.62	6.655	0.995
7B05916-CCV1	1965840	633703	3.102	2449900	119.664	9.322	9.352	0.997
7B05916-CCV2	1511550	491003	3.078	1877430	91.702	8.91	8.947	0.996
7B05916-CCV3	1536050	507583	3.026	1906980	93.145	9.025	9.051	0.997
7B05916-IFA1	504817	175064	2.884	1479180	72.25	7.585	7.604	0.998
7B05916-LCV1	417595	154081	2.71	2466390	120.469	9.333	9.374	0.996
7B05916-LCV2	371024	140633	2.638	2137140	104.387	9.223	9.251	0.997
7B05916-LCV3	365448	140809	2.595	2184820	106.716	9.275	9.305	0.997
7B28010-BLK1	0	0		2425140	118.455	9.4	9.463	0.993
7B28010-BS1	789252	273733	2.883	2498480	122.037	9.462	9.483	0.998
7B28010-MS1	478348	167200	2.861	1358820	66.371	6.574	6.601	0.996
7B28010-MSD1	479728	162893	2.945	1369850	66.91	6.583	6.618	0.995

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

Perchlorate Analysis Evaluation

3/10/2017 Seq. ID #7C07604

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718
6E14115-CAL3	327868	115234	2.845	2093390		9.679
6E14115-CAL4	670491	225125	2.978	2045940		9.729
6E14115-CAL5	1755730	562562	3.121	2072140		9.719
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719
1702155-02	615108	241381	2.548	2051760	100.217	8.323
1702204-01	4202050	1312020	3.203	1837990	89.776	7.974
1703001-02	0	0		1479070	72.244	7.2
1703035-01	26473.7	0		934570	45.649	6.497
1703081-15	2629790	832064	3.161	1980300	96.727	7.641
1703081-17	3713170	1155780	3.213	1884730	92.059	7.661
7C07604-CCV1	1793200	572622	3.132	2260790	110.427	8.59
7C07604-CCV2	1652820	534506	3.092	2075100	101.357	8.366
7C07604-IFA1	486210	162357	2.995	1528080	74.638	7.161
7C07604-LCV1	367007	117047	3.136	2166580	105.825	8.39
7C07604-LCV2	343368	99746.3	3.442	2044810	99.878	8.194
7C10018-BLK1	0	0		1981720	96.796	8.7
7C10018-BS1	480063	161622	2.97	1560300	76.212	8.786

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

RT Perc89	RRT
9.729	0.998
9.741	0.998
9.699	0.998
9.751	0.998
9.74	0.998
9.722	0.998
9.746	0.998
9.717	0.999
9.744	0.997
8.365	0.995
8.011	0.995
7.276	0.99
6.528	0.995 see NCR
7.666	0.997
7.697	0.995
8.62	0.997
8.397	0.996
7.224	0.991
8.44	0.994
8.237	0.995
8.747	0.995
8.816	0.997

**ANALYTICAL DATA PACKAGE**

SDG # 1703035

PROJECT NAME: Longhorn**SUBMITTAL TO:**

Adriane Steed

Microbac Laboratories,
Inc. 158 Starlite Drive

Marietta, OH 45750

SUBMITTAL BY:

Empirical Laboratories, LLC (EL)

621 Mainstream Drive, Suite 270

Nashville, TN 37228

Tel (615)345-1115

Fax (866)417-0548

LABORATORY CONTACT PERSON:

Project Manager: Sonya Gordon

Tel (615)345-1115

Fax (866)417-0548

Email: sgordon@empirlabs.com

Original Report Date: March 20, 2017

Report Revision #: N/A

Revision Date: N/A

THIS DOCUMENT MEETS DoD QSM 5.0 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Data Review Manager, Ms. Amy Barnett, is responsible for the final data produced and reported. Her signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

L-A-B Accredited - Certificate Number L2226 - Testing

Table of Contents

#	Description
1	Cover Page
2	Table of Contents
3	Case Narrative
4	Sample Receipt Information Chain of Custody Forms Sample Receipt Confirmations WorkOrder Summary Sample Delivery Group (SDG) Sheets
5	Data for Perchlorate Required Data / QAQC / Calibration Forms Supporting Raw Data / Logs

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

This is an original submittal of the final report package.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

Perchlorate:

Note – Sample 1703035-01 was analyzed at a 20x due to sample matrix.

The following internal standards exceeded criteria:

Perchlorate-d18 with a negative bias in 1703035-01; note – the sample was not able to be re-analyzed due to sample matrix

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- DL:** The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 5.0 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 5.0 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** Exceeding quality control criteria are associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.
- H:** The result was analyzed, extracted, or received outside of the EPA recommended holding time.
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte and that the analyte's DL/LOD/LOQ have been raised.

- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported. If there is greater than a 100% difference indicated on the form 10, the lower of the two values is reported.
- Q:** The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Calibration Verification, internal standard, Blank Spike and/or Blank Spike Duplicate.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or co-elution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.
- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase

incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Ms. Amy M. Barnett
Data Review Manager

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 01/18/2017)

00841957

DoD ELAP QSM5.0, Certificate Number L2226

- Aqueous
- Non-aqueous
- Expires: 11/30/2018

State of Florida, Department of Health – NELAP Primary, Lab ID: E87646

- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2017

State of Georgia, Environmental Protection Agency – NELAP, Self Certification

- Expires: 06/30/2017

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017

- Wastewater
- Expires: 12/31/2017

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77

- Aqueous
- Non-aqueous
- Expires: 06/30/2017

State of New Jersey, Department of Environmental Protection – NELAP, Lab ID: TN473

- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2017

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-16-14

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Utah, Department of Health – NELAP, Certificate Number: TN0042016-8

- Aqueous
- Non-aqueous
- Expires: 07/31/2017

**Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 8924,
Lab ID: 460243**

- Aqueous
- Non-aqueous
- Expires: 12/14/2017

State of Washington, Department of Ecology – NELAP, Lab ID: C934-16

- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2017

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg)} * \text{Expected Vol/Weight (mL or g)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL)} * \text{Final Vol (ml)} * \text{Dilution} * (1000\text{uL/mL})}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL)} * \text{Final Vol (mL)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Sample Receipt Information

CHAIN OF CUSTODY



1703035-01 A

Name Of Lab Shipping To: EMPRIKAL (615) 345-1115 ATTN: SONYA GORDON

Project: AECOM
 LONGHORN ARMY AMMN. PLANT (LHAAP)
 GROUNDWATER TREATMENT PLANT (GWTP)
 KARNACK, TEXAS

Project No.
 60256135.GWTP
 HRUMAR16

Job:
**GROUNDWATER TREATMENT PLANT
 WEEKLY SAMPLES**

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D. Sample Matrix Date / Time
LH18/24-SP650-6420-Grab Water 03/01/17 / 15:00

MS / MSD	NO. OF CONTAINERS	ANALYSES	REMARKS (Preservatives, etc.)	LAB I.D.#
1	X			01

Additional Remarks: **STANDARD TAT**

Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	03/01/17	15:30	<i>[Signature]</i>	3/2/17	0910

For Lab Use Only			
Received At Lab By:	Date	Time	Condition
Remarks:			

(Word) S:\1-ces\Forms\Chain of Custody - BWWeekly

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 3/2/17@0910

Work-order# 1703035

- 1. Tracking # NA (last 4 digits, FedEx)
Courier: FedEx
- 2. Temperature of rep. sample or temp blank when opened: 1.6 °C + correction factor (-0.1) = 1.5 °C
(Temp Fluke#1 SN17680086)
- 3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA
- 4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: NA
- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTB 3/2/17

- 7. Were custody seals on containers: YES NO and Intact YES...NO...NA
Were these signed and dated correctly? JTB-3/2/17 YES...NO...NA
- 8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc.)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13. a. Were VOA vials received? YES...NO...NA
b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA
- 14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTB 3/2/17

- 15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA
b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA
- 16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documented? YES...NO...NA
- 17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documented? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) JTB 3/2/17

- 18. Were custody papers properly filled out (ink, signed, etc.)? YES...NO...NA
- 19. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 20. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA
- 21. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA
- 22. Were there Non-Conformance issues at login? YES...NO...NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) JTB 3/2/17
I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) JTB 3/2/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) JTB 3/2/17


Empirical Laboratories, LLC
WORK ORDER
1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division
Project: Longhorn
Project Manager: Sonya Gordon
Project Number: MIC_Perc
Report To:

 Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone: (740) 373-4071
 Fax: (740) 373-4835

Invoice To:

 Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone : (740) 373-4071
 Fax: (740) 373-4835

Date Due: 03/16/2017 16:00 (10 day TAT)

Date Received: 03/02/2017 09:10

Logged In By: Joshua T. Gross

Received By: Joshua T. Gross

 Samples Received at: **1.5°C**

Custody seals on the o	No	Samples received on i	Yes	Any headspace in vials	No
All containers in good	Yes	Custody seals intact?	No	Trip blank received?	No
Did the containers mat	Yes	Proper packing materi	Yes	Cyanide Effluent samp	No
Preserved containers a	No	VOA vials received?	No	608 Pest/PCB sample:	No

Analysis	TAT	Expires	Version	Comments
1703035-01 LH18/24-SP650-6420-Grab [Water] Sampled 03/01/2017 15:00 (GMT-06:00) Central Time (US & Canada)				
LCMS_PERC_6850_Q5	10	03/29/2017 15:00		

Sample Delivery Group Assignment Form

CLIENT: Microbac Laboratories, Inc.-Ohio Valley Division
PROJECT NAME: Longhorn
SDG #: 1703035

QC LEVEL: Level III
Report Due: 3/16/2017
Client Sample Count: 1

Sample Type	Sampled	Received	Lab ID	Client ID	Lab Matrix	SW6850
Client Sample	3/1/2017	3/2/2017	1703035-01	LH18/24-SP650-6420-Grab	Water	X

Forms For Perchlorates

Sample Extraction Data

Prep Method: PERC_6850_W-SW6850

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [mL]	Final [mL]	Dilution	% Solids	Notes	Date
1703035-01 [LH18/24-SP650-6420-Grab]	7C07025	10.00/10.00	10.0	10.0	20.00			03/07/17

ANALYSIS DATA SHEET

LH18/24-SP650-6420-Grab

Laboratory: Empirical Laboratories, LLC SDG: 1703035
 Client: Microbac Laboratories, Inc.-Ohio Vall Project: Longhorn
 Matrix: Water Laboratory ID: 1703035-01 File ID: PERC000011.D.Report.TXT
 Sampled: 03/01/17 15:00 Prepared: 03/07/17 13:28 Analyzed: 03/17/17 12:58
 Solids: Preparation: PERC 6850 W Dilution: 20
 Batch: 7C07025 Sequence: 7C07604 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		10.0	20.0	40.0	UQ

Total Target Analytes Reported 1 Project Analytes: 1

LCS / LCS DUPLICATE RECOVERY

SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Matrix: Water
Batch: 7C07025 Laboratory ID: 7C07025-BS1
Preparation: PERC_6850_W Initial/Final: 10 mL / 10 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Perchlorate	2.000	2.055	103	84 - 119

PREPARATION BATCH SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Batch: 7C07025 Batch Matrix: Water Preparation: PERC_6850_W

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
LH18/24-SP650-6420-Grab	1703035-01	03/07/17 13:28	10.00	10.00
Blank	7C07025-BLK1	03/07/17 13:28	10.00	10.00
LCS	7C07025-BS1	03/07/17 13:28	10.00	10.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: 1703035
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7C07025-BLK1 File ID: PERC000008.D.Report.TXT
 Sampled: Prepared: Analyzed: 03/07/17 17:47
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7C07025 Sequence: 7C06615 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		0.500	1.00	2.00	U

Total Target Analytes Reported: 1

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1703035
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7C07025-BS1 File ID: PERC000009.D.Report.TXT
 Sampled: Prepared: Analyzed: 03/07/17 18:06
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7C07025 Sequence: 7C06615 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	2.055	0.500	1.00	2.00	

Total Target Analytes Reported: 1

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 05/21/16
Instrument ID: LCMS1 Injection Time: 09:46
Sequence: 6E14115 Lab Sample ID: 6E14115-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 03/07/17
Instrument ID: LCMS1 Injection Time: 15:54
Sequence: 7C06615 Lab Sample ID: 7C06615-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 03/17/17
Instrument ID: LCMS1 Injection Time: 10:08
Sequence: 7C07604 Lab Sample ID: 7C07604-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7C06615

Lab Sample ID	Analyte	True	Found	%R	Units
7C06615-IFA1	Perchlorate-d18	5.000	5.00	52.2	ug/L
	Perchlorate	2.000	2.03	101	ug/L

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7C07604

Lab Sample ID	Analyte	True	Found	%R	Units
7C07604-IFA1	Perchlorate-d18	5.000	5.00	67.6	ug/L
	Perchlorate	2.000	1.86	93.2	ug/L

ANALYSIS SEQUENCE SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703035
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Sequence: 6E14115 Instrument: LCMS1
Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	6E14115-TUN1	PERC000002.D.Report.TXT	05/21/16 09:46
Cal Standard	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
Cal Standard	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
Cal Standard	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
Cal Standard	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
Cal Standard	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
Cal Standard	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
Cal Standard	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
Cal Standard	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44
Initial Cal Check	6E14115-ICV1	PERC000014.D.Report.TXT	05/21/16 13:20

ANALYSIS SEQUENCE SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703035
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7C07604 Instrument: LCMS1
 Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	7C07604-TUN1	PERC000002.D.Report.TXT	03/17/17 10:08
Calibration Check	7C07604-CCV1	PERC000004.D.Report.TXT	03/17/17 10:46
Low Cal Check	7C07604-LCV1	PERC000007.D.Report.TXT	03/17/17 11:43
Interference Check A	7C07604-IFA1	PERC000008.D.Report.TXT	03/17/17 12:01
LH18/24-SP650-6420-Grab	1703035-01	PERC000011.D.Report.TXT	03/17/17 12:58
Calibration Check	7C07604-CCV2	PERC000023.D.Report.TXT	03/17/17 16:44
Low Cal Check	7C07604-LCV2	PERC000024.D.Report.TXT	03/17/17 17:03

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703035
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7C06615 Instrument: LCMS1
 Calibration: 6144001

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7C06615-CCV1)		Lab File ID: PERC000004.D.Report.TXT			Analyzed: 03/07/17 16:31	
Perchlorate-d18	1405020	8.165	2047316	69	50 - 150	
Low Cal Check (7C06615-LCV1)		Lab File ID: PERC000005.D.Report.TXT			Analyzed: 03/07/17 16:50	
Perchlorate-d18	1270400	8.115	2047316	62	50 - 150	
Interference Check A (7C06615-IFA1)		Lab File ID: PERC000006.D.Report.TXT			Analyzed: 03/07/17 17:09	
Perchlorate-d18	733438	6.936	2047316	36	50 - 150	*
Blank (7C07025-BLK1)		Lab File ID: PERC000008.D.Report.TXT			Analyzed: 03/07/17 17:47	
Perchlorate-d18	1379770	8.165	2047316	67	50 - 150	
LCS (7C07025-BS1)		Lab File ID: PERC000009.D.Report.TXT			Analyzed: 03/07/17 18:06	
Perchlorate-d18	1456090	8.245	2047316	71	50 - 150	
Calibration Check (7C06615-CCV2)		Lab File ID: PERC000016.D.Report.TXT			Analyzed: 03/07/17 20:18	
Perchlorate-d18	1579200	8.037	2047316	77	50 - 150	
Low Cal Check (7C06615-LCV2)		Lab File ID: PERC000017.D.Report.TXT			Analyzed: 03/07/17 20:37	
Perchlorate-d18	1669230	8.039	2047316	82	50 - 150	

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Sequence:	<u>7C07604</u>	Instrument:	<u>LCMS1</u>
		Calibration:	<u>6144001</u>

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7C07604-CCV1)		Lab File ID: PERC000004.D.Report.TXT		Analyzed: 03/17/17 10:46		
Perchlorate-d18	2260790	8.62	2047316	110	50 - 150	
Low Cal Check (7C07604-LCV1)		Lab File ID: PERC000007.D.Report.TXT		Analyzed: 03/17/17 11:43		
Perchlorate-d18	2166580	8.44	2047316	106	50 - 150	
Interference Check A (7C07604-IFA1)		Lab File ID: PERC000008.D.Report.TXT		Analyzed: 03/17/17 12:01		
Perchlorate-d18	1528080	7.224	2047316	75	50 - 150	
LH18/24-SP650-6420-Grab (1703035-01)		Lab File ID: PERC000011.D.Report.TXT		Analyzed: 03/17/17 12:58		
Perchlorate-d18	934570	6.528	2047316	46	50 - 150	*
Calibration Check (7C07604-CCV2)		Lab File ID: PERC000023.D.Report.TXT		Analyzed: 03/17/17 16:44		
Perchlorate-d18	2075100	8.397	2047316	101	50 - 150	
Low Cal Check (7C07604-LCV2)		Lab File ID: PERC000024.D.Report.TXT		Analyzed: 03/17/17 17:03		
Perchlorate-d18	2044810	8.237	2047316	100	50 - 150	

INITIAL CALIBRATION DATA

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:39 5/21/16 12:44

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	0.2	0.7845944	0.5	0.7849415	1	0.783103	2	0.8192946	5	0.8473028	10	0.8833049
Perchlorate (101)	0.2		0.5		1		2		5		10	
Perchlorate (85)	0.2	0.334203	0.5	0.290602	1	0.275233	2	0.2750875	5	0.2714884	10	0.2777807

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	20	0.928708	50	0.9971742								
Perchlorate (101)	20		50									
Perchlorate (85)	20	0.2935408	50	0.3188878								

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Mean RF	RF RSD	Slope/QR A	Intercept/QR B	QR C	LR r/QRCOD	LIMIT	Q	Typ
Perchlorate	0.8535529	9.160918					20		A
Perchlorate (101)							20		A
Perchlorate (85)	0.2921029	7.869005					20		A

INITIAL CALIBRATION CHECK

SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000014.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>6E14115</u>	Injection Date:	<u>05/21/16</u>
Lab Sample ID:	<u>6E14115-ICV1</u>	Injection Time:	<u>13:20</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Perchlorate	A	5.000	4.824	0.8535529	0.8235756		-3.5	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C06615</u>	Injection Date:	<u>03/07/17</u>
Lab Sample ID:	<u>7C06615-CCV1</u>	Injection Time:	<u>16:31</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.690	0.8535529	0.8006932		-6.2	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000016.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C06615</u>	Injection Date:	<u>03/07/17</u>
Lab Sample ID:	<u>7C06615-CCV2</u>	Injection Time:	<u>20:18</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.827	0.8535529	0.8239678		-3.5	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV1</u>	Injection Time:	<u>10:46</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.646	0.8535529	0.7931741		-7.1	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703035</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000023.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV2</u>	Injection Time:	<u>16:44</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.666	0.8535529	0.7965014		-6.7	15

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703035**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C06615-LCV1**Sequence:** 7C06615**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.078	7.8	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703035**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C06615-LCV2**Sequence:** 7C06615**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	1.053	5.3	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703035**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV1**Sequence:** 7C07604**Standard ID:** 17C0170

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9923	-0.8	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703035**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV2**Sequence:** 7C07604**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9837	-1.6	30.00

HOLDING TIME SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703035Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: Longhorn

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LH18/24-SP650-6420-Grab	03/01/17 15:00	03/02/17 09:10	03/07/17 13:28	5.94	28.00	03/17/17 12:58	15.92	28.00	

PREPARATION BENCH SHEET

7C07025

Empirical Laboratories, LLC

Printed: 3/20/2017 12:52:23PM

Instrument: LCMS1

Prepared using: GCLC - PERC_6850_W

(No Surrogate)

Matrix: Water

Lab Number	Cont ID	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1703035-01	A	LCMS_PERC_6850_Q5	03/07/2017	10.00	10.00					NA	Diluted 10x due to conductivity KEP 3-7-17 Prepared sample had a gooey film on top. 3-17-17 KEP
7C07025-BLK1		LCMS_PERC_6850_Q5	03/07/2017	10.00	10.00					NA	
7C07025-BS1		LCMS_PERC_6850_Q5	03/07/2017	10.00	10.00	17A0609		20		NA	

Reagents Used:

Standard	Description
16J0607	Water HPLC GRADE

SEQUENCE TABLE:

```

=====
Line           : 1
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

Eluent ID 16E0510
16E0510

```

=====
Line           : 2
Location       : Vial 1
Sample Information :
Sample Name    : 6E14115-TUN1 16D0464
=====

```

```

=====
Line           : 3
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 4
Location       : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 5
Location       : Vial 91
Sample Information :
Sample Name    : 6E14115-CAL1 16D0529
=====

```

```

=====
Line           : 6
Location       : Vial 92
Sample Information :
Sample Name    : 6E14115-CAL2 16D0529
=====

```

```

=====
Line           : 7
Location       : Vial 93
Sample Information :
Sample Name    : 6E14115-CAL3 16D0530
=====

```

```

=====
Line           : 8
Location       : Vial 94
Sample Information :
Sample Name    : 6E14115-CAL4 16D0531
=====

```

Line : 9
Location : Vial 95
Sample Information :
Sample Name : 6E14115-CAL5 1600532

=====
Line : 10
Location : Vial 96
Sample Information :
Sample Name : 6E14115-CAL6 1600533

=====
Line : 11
Location : Vial 97
Sample Information :
Sample Name : 6E14115-CAL7 1600534

=====
Line : 12
Location : Vial 98
Sample Information :
Sample Name : 6E14115-CAL8 1600536

=====
Line : 13
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 14
Location : Vial 99
Sample Information :
Sample Name : 6E14115-ICV1 1600537

=====
Line : 15
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV1 NOT USING

=====
Line : 16
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV1

=====
Line : 17
Location : Vial 5
Sample Information :
Sample Name : 6E14115-IFAL



01671

=====
Line : 18
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank NOT USING
=====

=====
Line : 19
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 20
Location : Vial 41
Sample Information :
Sample Name : 1605063-01@100
=====

=====
Line : 21
Location : Vial 42
Sample Information :
Sample Name : 1605063-02@100
=====

=====
Line : 22
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV2
=====

=====
Line : 23
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV2
=====

=====
Line : 24
Location : Vial 5
Sample Information :
Sample Name : 6E-IFA1
=====

=====
Line : 25
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 26
Location : Vial 2
=====

SR 5-23-14

P1672

Sample Information :
Sample Name : Reagent Blank

=====
Line : 27
Location : Vial 51
Sample Information :
Sample Name : 6E-IFA2600

=====
Line : 28
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 29
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

[Handwritten signature]

SEQUENCE TABLE: *eluent IDs: 17C0142, 17C0143*

```

=====
Line           : 1
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 2
Location      : Vial 1
Sample Information :
Sample Name   : 7C06615-TUN1 17A0677
=====

```

```

=====
Line           : 3
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 4
Location      : Vial 3
Sample Information :
Sample Name   : 7C06615-CCV1 17A0678
=====

```

```

=====
Line           : 5
Location      : Vial 4
Sample Information :
Sample Name   : 7C06615-LCV1 17A0679
=====

```

```

=====
Line           : 6
Location      : Vial 5
Sample Information :
Sample Name   : 7C06615-IFA1 16E0477
=====

```

```

=====
Line           : 7
Location      : Vial 81
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 8
Location      : Vial 20
Sample Information :
Sample Name   : 7C07025-BLK1
=====

```

Line : 9
Location : Vial 21
Sample Information :
Sample Name : 7C07025-BS1

Line : 10
Location : Vial 22
Sample Information :
Sample Name : 1703035-01@10

Line : 11
Location : Vial 23
Sample Information :
Sample Name : 1703053-02 x |

Line : 12
Location : Vial 24
Sample Information :
Sample Name : 7C07025-MS1

Line : 13
Location : Vial 25
Sample Information :
Sample Name : 7C07025-MSD1

Line : 14
Location : Vial 26
Sample Information :
Sample Name : 1703053-03 ↵

Line : 15
Location : Vial 27
Sample Information :
Sample Name : 1703069-01@500

Line : 16
Location : Vial 3
Sample Information :
Sample Name : 7C06615-CCV2 17A0678

Line : 17
Location : Vial 4
Sample Information :
Sample Name : 7C06615-LCV2 17A0679

Handwritten signature

=====
Line : 18
Location : Vial 5
Sample Information :
Sample Name : 7C06615-IFA2 16F0477
=====

=====
Line : 19
Location : Vial 6
Sample Information :
Sample Name : 1702175-03@25
=====

=====
Line : 20
Location : Vial 7
Sample Information :
Sample Name : 7C01024-MS1@25
=====

=====
Line : 21
Location : Vial 8
Sample Information :
Sample Name : 7C01024-MS1@40
=====

=====
Line : 22
Location : Vial 9
Sample Information :
Sample Name : 1702204-01@100
=====

=====
Line : 23
Location : Vial 10
Sample Information :
Sample Name : 1702198-03@2
=====

=====
Line : 24
Location : Vial 11
Sample Information :
Sample Name : 1702155-01@2
=====

=====
Line : 25
Location : Vial 12
Sample Information :
Sample Name : 7C03010-MS1@2
=====

=====
Line : 26
Location : Vial 13
=====

008420038
3-8-17
PWA

Sample Information :
Sample Name : 7C03010-MSD1@2

=====
Line : 27
Location : Vial 14
Sample Information :
Sample Name : 1702155-02@2

=====
Line : 28
Location : Vial 15
Sample Information :
Sample Name : 1702155-03@2

=====
Line : 29
Location : Vial 16
Sample Information :
Sample Name : 1702155-04@2

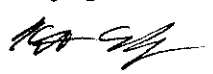
=====
Line : 30
Location : Vial 17
Sample Information :
Sample Name : 1702209-02@2

=====
Line : 31
Location : Vial 18
Sample Information :
Sample Name : 1702209-03@2

=====
Line : 32
Location : Vial 19
Sample Information :
Sample Name : 1703001-02@5

=====
Line : 33
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 34
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank



Line : 35
Location : Vial 3
Sample Information :
Sample Name : 7C06615-CCV3 17 40678

=====

Line : 36
Location : Vial 4
Sample Information :
Sample Name : 7C06615-LCV3 17 40679

=====

Line : 37
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====

3-20-17
Mitt 9/11

SEQUENCE TABLE: *eluent IDs: 17C0319, 17C0320*

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7C07604-TUN1 *17A0677*
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 5
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 6
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV1 *17C0169*
=====

=====
Line : 7
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV1 *17A0679*
=====

=====
Line : 8
Location : Vial 5
Sample Information :
Sample Name : 7C07604-IFA1 *16F0977*
=====

3-20-17
Alvin SM

Line : 9
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 10
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 11
Location : Vial 6
Sample Information :
Sample Name : 1703035-01@20

=====
Line : 12
Location : Vial 7
Sample Information :
Sample Name : 1702204-01@200

=====
Line : 13
Location : Vial 8
Sample Information :
Sample Name : 1702155-02@5

=====
Line : 14
Location : Vial 9
Sample Information :
Sample Name : 1703001-02@10

=====
Line : 15
Location : Vial 10
Sample Information :
Sample Name : 7C10018-BLK1

=====
Line : 16
Location : Vial 11
Sample Information :
Sample Name : 7C10018-BS1

=====
Line : 17
Location : Vial 12
Sample Information :
Sample Name : 1702102-07 *X1*

3-20-17

Handwritten signature

=====
 Line : 18
 Location : Vial 13
 Sample Information :
 Sample Name : 1703067-02 *lx*

=====
 Line : 19
 Location : Vial 14
 Sample Information :
 Sample Name : 1703067-03

=====
 Line : 20
 Location : Vial 15
 Sample Information :
 Sample Name : 1703081-15

=====
 Line : 21
 Location : Vial 16
 Sample Information :
 Sample Name : 1703081-16

=====
 Line : 22
 Location : Vial 17
 Sample Information :
 Sample Name : 1703081-17

=====
 Line : 23
 Location : Vial 3
 Sample Information :
 Sample Name : 7C07604-CCV2 *17C0169*

=====
 Line : 24
 Location : Vial 4
 Sample Information :
 Sample Name : 7C07604-LCV2 *17A0679*

=====
 Line : 25
 Location : Vial 18
 Sample Information :
 Sample Name : 1703081-18 *lx*

=====
 Line : 26
 Location : Vial 19
1703081-19

3-20-17
140511

Sample Information :
Sample Name : 1703081-19

1x

=====
Line : 27
Location : Vial 20
Sample Information :
Sample Name : 1703081-25

=====
Line : 28
Location : Vial 21
Sample Information :
Sample Name : 1703081-27

=====
Line : 29
Location : Vial 22
Sample Information :
Sample Name : 1703081-29

=====
Line : 30
Location : Vial 23
Sample Information :
Sample Name : 1703081-31

✓

=====
Line : 31
Location : Vial 24
Sample Information :
Sample Name : 1703094-01@10

=====
Line : 32
Location : Vial 25
Sample Information :
Sample Name : 1703098-02

1x

=====
Line : 33
Location : Vial 26
Sample Information :
Sample Name : 7C10018-MS1

=====
Line : 34
Location : Vial 27
Sample Information :
Sample Name : 7C10018-MSD1

✓

3-20-17

[Handwritten signature]

Line : 35
Location : Vial 28
Sample Information :
Sample Name : 1703098-22

lx
↓

=====
Line : 36
Location : Vial 29
Sample Information :
Sample Name : 1703098-23

=====
Line : 37
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV3 17C0169

=====
Line : 38
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV3 17A0679

=====
Line : 39
Location : Vial 30
Sample Information :
Sample Name : 1702102-07@5

=====
Line : 40
Location : Vial 31
Sample Information :
Sample Name : 1703067-02@5

=====
Line : 41
Location : Vial 32
Sample Information :
Sample Name : 1703067-03@5

=====
Line : 42
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV4 17C0169

=====
Line : 43
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV4 17A0679

100 mg

=====
Line : 44
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 45
Location : Vial 33
Sample Information :
Sample Name : 7C15019-BLK1
=====

=====
Line : 46
Location : Vial 34
Sample Information :
Sample Name : 7C15019-BS1
=====

=====
Line : 47
Location : Vial 35
Sample Information :
Sample Name : 1703085-01 *(x)*
=====

=====
Line : 48
Location : Vial 36
Sample Information :
Sample Name : 7C15019-MS1
=====

=====
Line : 49
Location : Vial 37
Sample Information :
Sample Name : 7C15019-MSD1
=====

=====
Line : 50
Location : Vial 38
Sample Information :
Sample Name : 1703085-02
=====

=====
Line : 51
Location : Vial 39
Sample Information :
Sample Name : 1703110-01
=====

=====
Line : 52
Location : Vial 40
=====

1703110-02

3-20-17
JTT

Sample Information :
Sample Name : 1703110-02 1x

=====
Line : 53
Location : Vial 41
Sample Information :
Sample Name : 1703110-03

=====
Line : 54
Location : Vial 42
Sample Information :
Sample Name : 1703110-04

=====
Line : 55
Location : Vial 43
Sample Information :
Sample Name : 1703110-05

=====
Line : 56
Location : Vial 44
Sample Information :
Sample Name : 1703110-06

=====
Line : 57
Location : Vial 45
Sample Information :
Sample Name : 1703110-07

=====
Line : 58
Location : Vial 46
Sample Information :
Sample Name : 1703110-08

=====
Line : 59
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV5 17C0169

=====
Line : 60
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV5 17A0679

LCMS-1 \ 6850

3-20-17

Handwritten signature

Line : 61
Location : Vial 47
Sample Information :
Sample Name : 1703110-09

X

=====
Line : 62
Location : Vial 48
Sample Information :
Sample Name : 1703110-10

=====
Line : 63
Location : Vial 49
Sample Information :
Sample Name : 1703110-11

V

=====
Line : 64
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV6 17C0169

=====
Line : 65
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV6 17A0679

=====
Line : 66
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 67
Location : Vial 50
Sample Information :
Sample Name : 7C17011-BLK1

=====
Line : 68
Location : Vial 51
Sample Information :
Sample Name : 7C17011-BS1

=====
Line : 69
Location : Vial 52
Sample Information :
Sample Name : 1703092-01

X

LCMS-1\6850

3-20-17

[Handwritten signature]

=====
 Line : 70
 Location : Vial 53
 Sample Information :
 Sample Name : 7C17011-MS1 |x
 =====

=====
 Line : 71
 Location : Vial 54
 Sample Information :
 Sample Name : 7C17011-MSD1
 =====

=====
 Line : 72
 Location : Vial 55
 Sample Information :
 Sample Name : 1703093-02
 =====

=====
 Line : 73
 Location : Vial 56
 Sample Information :
 Sample Name : 1703093-03
 =====

=====
 Line : 74
 Location : Vial 57
 Sample Information :
 Sample Name : 1703093-04
 =====

=====
 Line : 75
 Location : Vial 58
 Sample Information :
 Sample Name : 1703104-01
 =====

=====
 Line : 76
 Location : Vial 59
 Sample Information :
 Sample Name : 1703104-03
 =====

=====
 Line : 77
 Location : Vial 60
 Sample Information :
 Sample Name : 1703104-05
 =====

=====
 Line : 78
 Location : Vial 61
 1703104-07
 =====

[Handwritten signature]

Sample Information :
Sample Name : 1703104-07

IX

=====
Line : 79
Location : Vial 62
Sample Information :
Sample Name : 1703104-10

=====
Line : 80
Location : Vial 63
Sample Information :
Sample Name : 1703104-11

↓

=====
Line : 81
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV7 17C0169

=====
Line : 82
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV7 17A0679

=====
Line : 83
Location : Vial 64
Sample Information :
Sample Name : 1703104-12

IX

=====
Line : 84
Location : Vial 65
Sample Information :
Sample Name : 1703104-13

=====
Line : 85
Location : Vial 66
Sample Information :
Sample Name : 1703105-01

=====
Line : 86
Location : Vial 67
Sample Information :
Sample Name : 1703106-14

↓

3-20-17
[Signature]

Line : 87
Location : Vial 68
Sample Information :
Sample Name : 1703107-01

lx

=====
Line : 88
Location : Vial 69
Sample Information :
Sample Name : 1703124-02

=====
Line : 89
Location : Vial 70
Sample Information :
Sample Name : 1703124-03

=====
Line : 90
Location : Vial 71
Sample Information :
Sample Name : 1703124-04

=====
Line : 91
Location : Vial 72
Sample Information :
Sample Name : 1703151-02

=====
Line : 92
Location : Vial 73
Sample Information :
Sample Name : 1703151-03

[Arrow pointing down]

=====
Line : 93
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV8

17C0679

=====
Line : 94
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV8

17A0679

=====
Line : 95
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

Perchlorate Analysis Evaluation

5/21/2016

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
Perchlorate 0.2 ug/L	65435.8	27872.8	2.3	2085020		9.707	9.729	0.998
Perchlorate 0.5 ug/L	162300	60086.9	2.7	2067670		9.733	9.741	0.999
Perchlorate 1.0 ug/L	327868	115234	2.8	2093390		9.679	9.699	0.998
Perchlorate 2.0 ug/L	670491	225125	3.0	2045940		9.729	9.751	0.998
Perchlorate 5.0 ug/L	1755730	562562	3.1	2072140		9.719	9.74	0.998
Perchlorate 10 ug/L	3646000	1146590	3.2	2063840		9.702	9.722	0.998
Perchlorate 20 ug/L	7550470	2386510	3.2	2032520		9.735	9.746	0.999
Perchlorate 50 ug/L	19125900	6116300	3.1	1918010		9.705	9.717	0.999
Perchlorate 5.0 ug/L ICV	1665970	536774	3.1	2022850	98.80	9.719	9.744	0.997
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
Average IS area of curve:	2047316							

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria \pm 50% of Avg IS of curve

CAL Date 04/25/16

Perchlorate Analysis Evaluation

3/7/2017 Seq. ID #7C06615

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1702155-01	215884	80842	2.67	1098750	53.668	7.062	7.076	0.998
1702155-03	1639160	568972	2.881	1234420	60.295	7.042	7.073	0.996
1702155-04	0	0		1239830	60.559	7	7.027	0.996
1702198-03	0	0		1225170	59.843	6.9	6.907	0.999
1702209-02	0	0		1180430	57.657	7	7.066	0.991
1702209-03	0	0		1165930	56.949	7	6.944	1.008
1703053-02	0	0		1548560	75.639	8.1	8.131	0.996
1703053-03	0	0		1579430	77.146	8.1	8.09	1.001
7C03010-MS1	433527	154444	2.807	1245590	60.84	6.933	6.99	0.992
7C03010-MSD1	427197	156146	2.736	1258240	61.458	6.919	6.963	0.994
7C06615-CCV1	1124990	364190	3.089	1405020	68.627	8.14	8.165	0.997
7C06615-CCV2	1301210	427148	3.046	1579200	77.135	8.002	8.037	0.996
7C06615-CCV3	1386850	465148	2.982	1707310	83.393	7.686	7.708	0.997
7C06615-IFA1	253602	58588.6	4.329	733438	35.824	6.885	6.936	0.993
7C06615-IFA2	356963	136791	2.61	1039640	50.781	7.232	7.085	1.021
7C06615-LCV1	233808	78875	2.964	1270400	62.052	8.078	8.115	0.995
7C06615-LCV2	300084	105734	2.838	1669230	81.533	8.016	8.039	0.997
7C06615-LCV3	314397	113656	2.766	1768370	86.375	7.8	7.829	0.996
7C07025-BLK1	0	0		1379770	67.394	8.2	8.165	1.004
7C07025-BS1	510877			1456090	71.122	8.216	8.245	0.996
7C07025-MS1	530387			1559640	76.18	8.048	8.08	0.996
7C07025-MSD1	531881			1575980	76.978	8.066	8.102	0.996

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

see NCR
KNOWN STD

Perchlorate Analysis Evaluation

3/10/2017 Seq. ID #7C07604

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718
6E14115-CAL3	327868	115234	2.845	2093390		9.679
6E14115-CAL4	670491	225125	2.978	2045940		9.729
6E14115-CAL5	1755730	562562	3.121	2072140		9.719
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719
1702155-02	615108	241381	2.548	2051760	100.217	8.323
1702204-01	4202050	1312020	3.203	1837990	89.776	7.974
1703001-02	0	0		1479070	72.244	7.2
1703035-01	26473.7	0		934570	45.649	6.497
1703081-15	2629790	832064	3.161	1980300	96.727	7.641
1703081-17	3713170	1155780	3.213	1884730	92.059	7.661
7C07604-CCV1	1793200	572622	3.132	2260790	110.427	8.59
7C07604-CCV2	1652820	534506	3.092	2075100	101.357	8.366
7C07604-IFA1	486210	162357	2.995	1528080	74.638	7.161
7C07604-LCV1	367007	117047	3.136	2166580	105.825	8.39
7C07604-LCV2	343368	99746.3	3.442	2044810	99.878	8.194
7C10018-BLK1	0	0		1981720	96.796	8.7
7C10018-BS1	480063	161622	2.97	1560300	76.212	8.786

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

RT Perc89	RRT
9.729	0.998
9.741	0.998
9.699	0.998
9.751	0.998
9.74	0.998
9.722	0.998
9.746	0.998
9.717	0.999
9.744	0.997
8.365	0.995
8.011	0.995
7.276	0.99
6.528	0.995 see NCR
7.666	0.997
7.697	0.995
8.62	0.997
8.397	0.996
7.224	0.991
8.44	0.994
8.237	0.995
8.747	0.995
8.816	0.997



March 13, 2017

Mr. Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, Ohio 45750

Re: Perchlorate-Steed
Work Order: 418362
SDG: 1703069-01A

Dear Mr. Steed:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 11, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4778.

Sincerely,

Julie Robinson for
Hope Taylor
Project Manager

Purchase Order: SIGNED QUOTE
Enclosures

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	7
Perchlorates by LCMSMS Analysis.....	9
Case Narrative.....	10
Sample Data Summary.....	16
Quality Control Summary.....	18
Sample Data.....	23
Standards.....	26
Quality Control Data.....	44
Miscellaneous.....	63

Case Narrative

Receipt Narrative
for
Microbac Laboratories, Inc Kentucky Division
SDG: 1703069-01A
Work Order: 418362

March 13, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on March 11, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.


Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
418362001	LH18/24-SP650-6421

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Perchlorates by LCMSMS.


Julie Robinson for
Hope Taylor
Project Manager

Chain of Custody and Supporting Documentation

Temp 3.9 +/- CF -0.1 = 3.8 °C
Custody Seals? Y Intact? Y

418362

CHAIN OF CUSTODY

ICAL (615) 345-1115 ATTN: SONYA GORDAN

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No.: 60256135.GWTPT HRUMAR16		Ana.	
Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES		P.O Number Scott Beesinger		MS / MSD	
Field Sample I.D. LH18/24-SP650-6421 01		Sample Matrix Water		Date / Time 03/06/17 / 15:00	
Prepared By: Scott Beesinger		NO. OF CONTAINERS 1		REMARKS PERCHLORATE	
Remarks (Preservatives, etc.) NONE		Lab I.D.#			

EMAIL RESULTS TO linda.raabe@aecom.com

24 HR. TAT

Additional Remarks:

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>[Signature]</i>	03/06/17	15:30	<i>[Signature]</i>	3/7/17	9:45	<i>[Signature]</i>	3/10/17	13:30	<i>[Signature]</i>	3/10/17	9:15

9 For Lab Use Only Received At Lab By: <i>[Signature]</i>		Date: 3/7/17 Time: 9:45		Airbill No.		Opened By: <i>[Signature]</i>		Date: 3/7/17 Time: 9:45		Temp of Container: 9.8		Seal No.		Condition: Good	
Remarks Contact Adrienne Steed (Microbac) with any questions 740-373-4071															

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On:

Work-order#

1703069

1. Tracking # 8878 (last 4 digits, FedEx)

Courier: FedEx UPS

2. Temperature of rep. sample or temp blank when opened: 39 °C + correction factor (-0.1) = 38 °C
(Temp Fluke#1 SN17680086)

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES NO NA

If yes, how many and where: 1 front + back

5. Were the seals intact, signed, and dated correctly? YES NO NA

6. Were custody papers inside cooler? YES NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 3/7/17

7. Were custody seals on containers: YES NO and Intact YES NO NA

Were these signed and dated correctly? YES NO NA

8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES NO NA

11. Were all container labels complete (#, date, signed, pres., etc.)? YES NO NA

12. Did all container labels and tags agree with custody papers? YES NO NA

13. a. Were VOA vials received? YES NO NA

b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES NO NA

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES NO NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 3/7/17

15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES NO NA

b. Did the bottle labels indicate that the correct preservatives were used? YES NO NA

16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documented? YES NO NA

17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documented? YES NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) TH 3/7/17

18. Were custody papers properly filled out (ink, signed, etc.)? YES NO NA

19. Did you sign the custody papers in the appropriate place? YES NO NA

20. Were correct containers used for the analysis requested? YES NO NA If not, PM notified? YES NO NA

21. Was sufficient amount of sample sent in each container? YES NO NA If not, PM notified? YES NO NA

22. Were there Non-Conformance issues at login? YES NO NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) TH 3/7/17

I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) TH 3/7/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 3/7/17

SAMPLE RECEIPT & REVIEW FORM

Client:		SDG/AR/COC/Work Order: 418362	
Received By: H. Taeflar		Date Received: 03/11/17	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 7234 2614 1026	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. 0cpm
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): _____ CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 2
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: 123-12 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added Lot#:
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>			If Yes, Are Cores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials H/T Date 03/11/17 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 13 March 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
 Technical Case Narrative
 Microbac Laboratories, Inc Kentucky Division (MBAC)
 SDG #: 1703069-01A
 Work Order #: 418362**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1646614

Prep Batch Number: 1646613

Sample Analysis

Sample ID	Client ID
418362001	418362001 (LH18/24-SP650-6421)
1203745351	Interference Check Sample (ICS)
1203745347	Method Blank (MB)
1203745348	Laboratory Control Sample (LCS)
1203745349	418362001(LH18/24-SP650-6421) Matrix Spike (MS)
1203745350	418362001(LH18/24-SP650-6421) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial

Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 418362001 (LH18/24-SP650-6421) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

Comments pertaining to Perchlorate-101 and/or the Perchlorate Isotope Ratio are applicable only when the client requests Perchlorate-101 and/or the Perchlorate Isotope Ratio be reported. Due to software constraints, Perchlorate, Perchlorate-101 and/or the Perchlorate Isotope Ratio may appear on raw data and comments referring to them may appear on certain Forms whether or not the client has requested one or all of them be reported. Due to software limitations, all initial calibration blanks must be designated as IPB001 in order for the forms to be correct. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards Prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and

dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

MBAC001 Microbac Laboratories, Inc Kentucky Division

Client SDG: 1703069-01A GEL Work Order: 418362

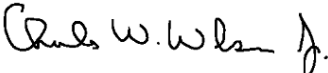
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Charles Wilson**Date:** 13 MAR 2017**Title:** Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1646613

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6421

Date Received: 11-MAR-17

GEL Job No (SDG): 1703069-01A

GEL Sample ID: 418362001

Date Filtered: 12-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.06	ug/L		1	12-MAR-17 15:22	per0312016a
	Perchlorate-O(18)			0.487	ug/L		1	12-MAR-17 15:22	per0312016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 1703069-01A

Extract Batch Code: 1646613

Date Filtered: 12-MAR-17

Matrix: WATER

Sample ID: 1203745348

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.199	ug/L	100		85 - 115
Perchlorate-O(18)		.487	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Interference Check Sample

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No. (SDG): 1703069-01AExtract Batch Code: 1646613Date Filtered: 12-MAR-17Matrix: WATERSample ID: 1203745351

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.199	ug/L	100		70 - 130
Perchlorate-O(18)		.521	ug/L			

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering LaboratoriesLab Code: GELGEL Job No (SDG): 1703069-01AExtract Batch Code: 1646613Date Extracted: 12-MAR-17GEL MS/PS ID: 1203745349Client ID: LH18/24-SP650-6421GEL MSD/PSD ID: 1203745350QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	1.06	ug/L	1.23	86	1.24	91	1	30	75 - 125
Perchlorate-O(18)	0	0.487	ug/L	0.484		.49		1		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate RT And Area Summary

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELHPLC Column: Dionex IonPac AG16Instrument ID: LCMSMS2

Sample ID	Datafile	Run Date	Area	RT	RT CLO4	RRT	Q 0.98-1.02
MidLevel Standard Area	per0312006a	12-MAR-17	21351.2				
Lower Area Limit			10675.6				
Upper Area Limit			32026.8				
1203745347	per0312013a	12-MAR-17 14:51	21694.5	4.01	4.0335	1.006	
1203745348	per0312014a	12-MAR-17 15:01	21074.1	3.98	4.00585	1.006	
1203745351	per0312015a	12-MAR-17 15:12	22533.5	3.67	3.7025	1.009	
418362001	per0312016a	12-MAR-17 15:22	21064.5	4.01	4.0335	1.006	
1203745349	per0312017a	12-MAR-17 15:33	20912.7	4.06	4.08867	1.007	
1203745350	per0312018a	12-MAR-17 15:43	21187.2	4.12	4.14383	1.006	

Sample Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: SW846 6850 Modified

Matrix: WATER

Extraction Batch ID: 1646613

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6421

Date Received: 11-MAR-17

GEL Job No (SDG): 1703069-01A

GEL Sample ID: 418362001

Date Filtered: 12-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.06	ug/L		1	12-MAR-17 15:22	per0312016a
	Perchlorate-O(18)			0.487	ug/L		1	12-MAR-17 15:22	per0312016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

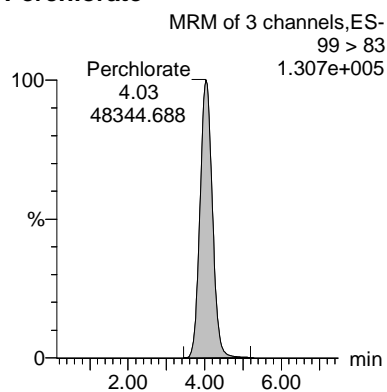
Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

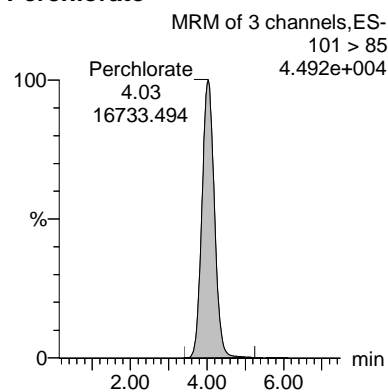
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312016a
Date: 12-Mar-2017
Time: 15:22:48
ID: 418362001
Vial: 1:3,D

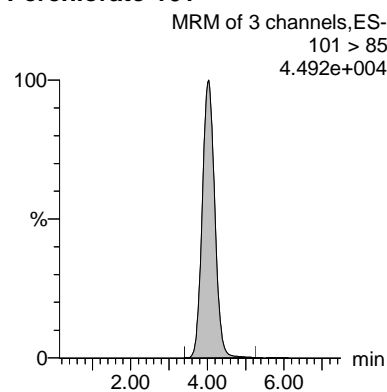
Perchlorate



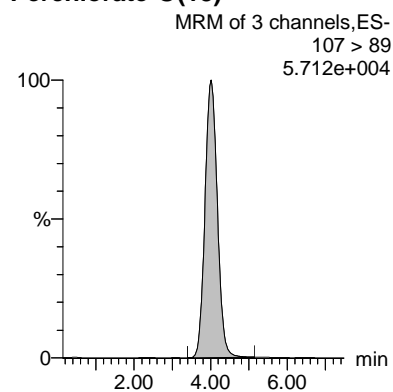
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
418362001	Perchlorate	99 > 83	4.03	48344.688	1.148	bb			1.0589			11670.... 2.89
418362001	Perchlorate-101	101 > 85	4.03	16733.494	0.397	bb			1.0833			2481.8...
418362001	Perchlorate-O(18)	107 > 89	4.01	21064.545	21064.545	bb			0.4872	97.43	-2.57	2935.5...

Standards

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 12-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname

Perchlorate

Coefficient of Determination:

Calibration Curve:

1.08333

Response Type:

Internal Standard

Curve Type:

RF

Perchlorate Initial Calibration

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELInstrument ID: LCMSMS2

Date Analyzed: 12-MAR-17

HPLC Column: Dionex IonPac AG16

Calibration Level	1	2	3	4	5	6
Cal Concentration (ug/L)	0.05	0.1	0.25	0.50	1.0	2.0

Parmname

Perchlorate-101

Coefficient of Determination:

Calibration Curve:

.36667

Response Type:

Internal Standard

Curve Type:

RF

Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time

Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031217a.mdb 12 Mar 2017 17:01:05**Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031217a.cdb 13 Mar 2017 09:51:17**

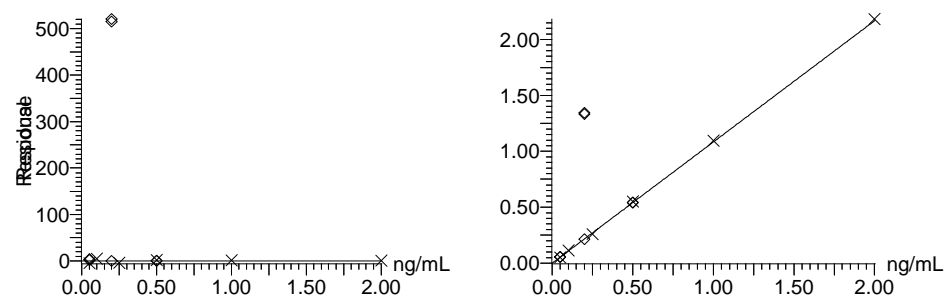
Compound name: Perchlorate

Response Factor: 1.08367

RRF SD: 0.0393064, % Relative SD: 3.62714

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



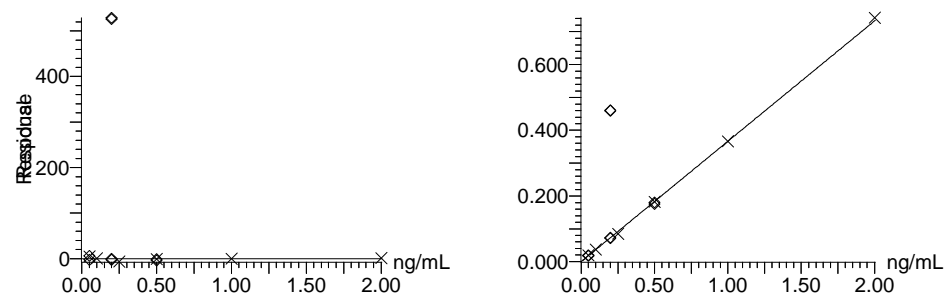
Compound name: Perchlorate-101

Response Factor: 0.366638

RRF SD: 0.0137844, % Relative SD: 3.75968

Response type: Internal Std (Ref 3), Area * (IS Conc. / IS Area)

Curve type: RF



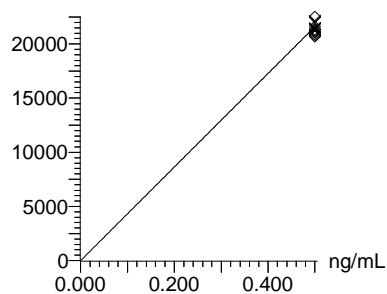
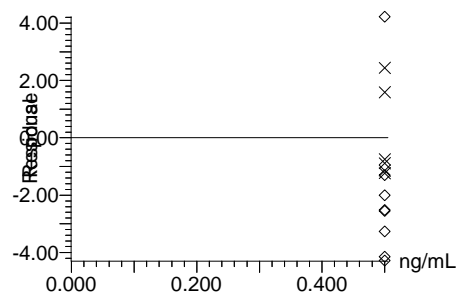
Quantify Calibration Report MassLynx 4.0 SP4

The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

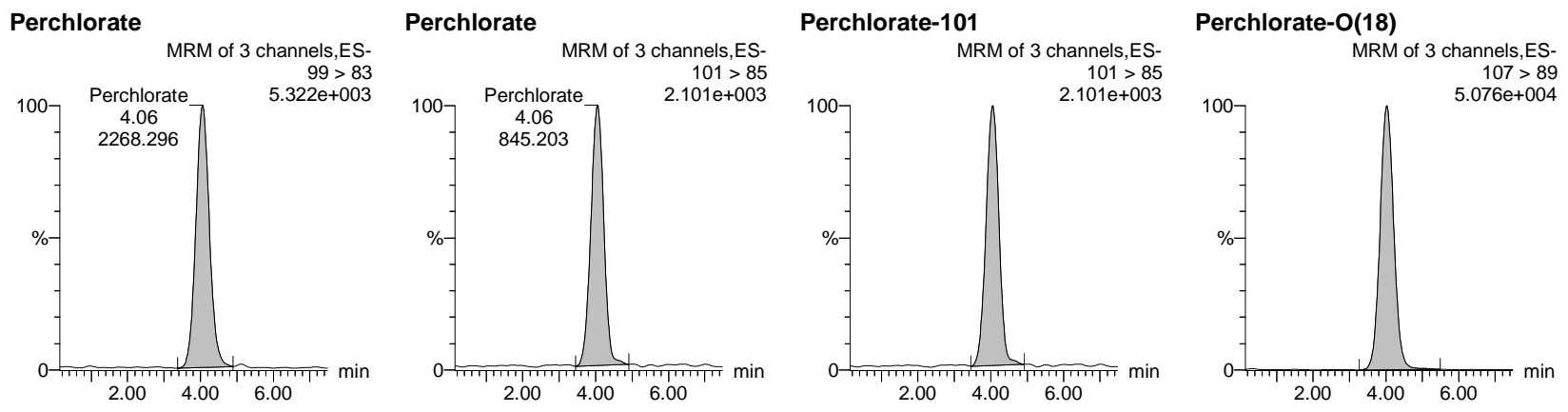
Compound name: Perchlorate-O(18)
Response Factor: 43238.8
RRF SD: 686.744, % Relative SD: 1.58826
Response type: External Std, Area
Curve type: RF



Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312003a
Date: 12-Mar-2017
Time: 13:06:56
ID: WCL170306-01
Vial: 1:1,B



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-01	Perchlorate	99 > 83	4.06	2268.296	0.052	bb			0.0477	95.31	-4.69	533.368	2.68
WCL170306-01	Perchlorate-101	101 > 85	4.06	845.203	0.019	bb			0.0525	104.97	4.97	562.530	
WCL170306-01	Perchlorate-O(18)	107 > 89	4.03	21962.146	21962.146	bb			0.5079	101.59	1.59	2485.2...	

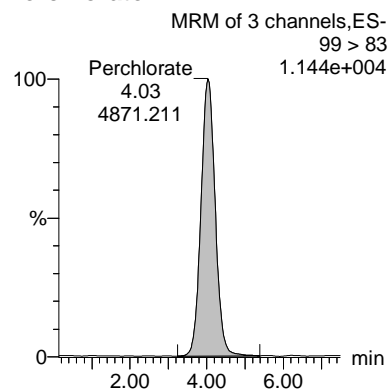
Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

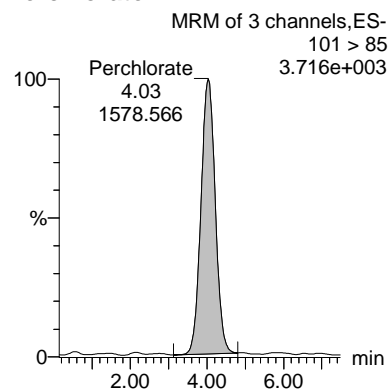
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312004a
Date: 12-Mar-2017
Time: 13:17:24
ID: WCL170306-02
Vial: 1:1,C

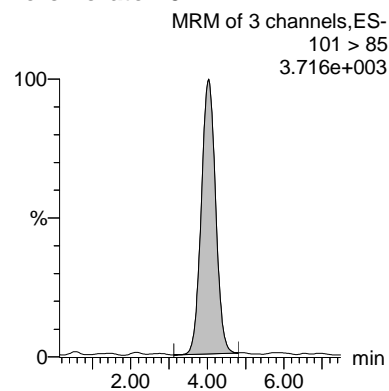
Perchlorate



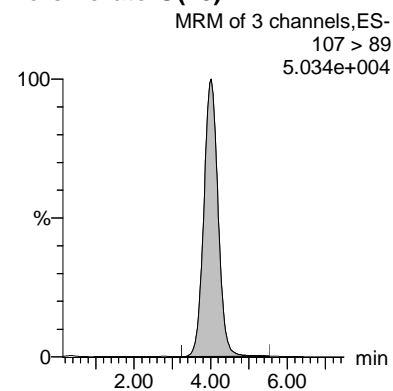
Perchlorate



Perchlorate-101



Perchlorate-O(18)

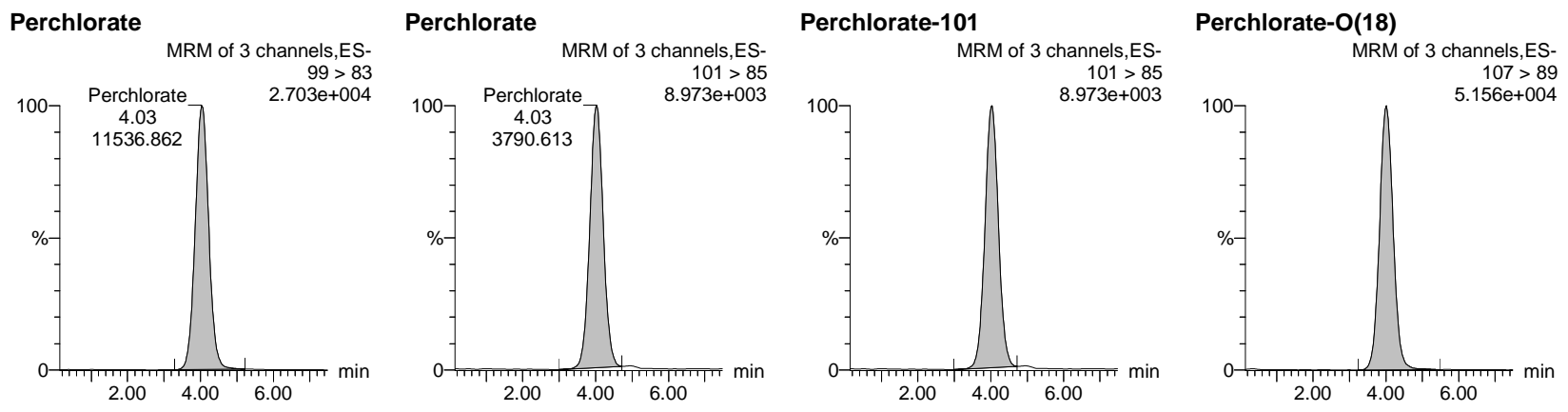


ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-02	Perchlorate	99 > 83	4.03	4871.211	0.114	bb			0.1049	104.89	4.89	1437.0...	3.09
WCL170306-02	Perchlorate-101	101 > 85	4.03	1578.566	0.037	bb			0.1005	100.47	0.47	338.249	
WCL170306-02	Perchlorate-O(18)	107 > 89	4.01	21427.828	21427.828	bb			0.4956	99.11	-0.89	2747.4...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312005a
Date: 12-Mar-2017
Time: 13:27:50
ID: WCL170306-03
Vial: 1:1,D

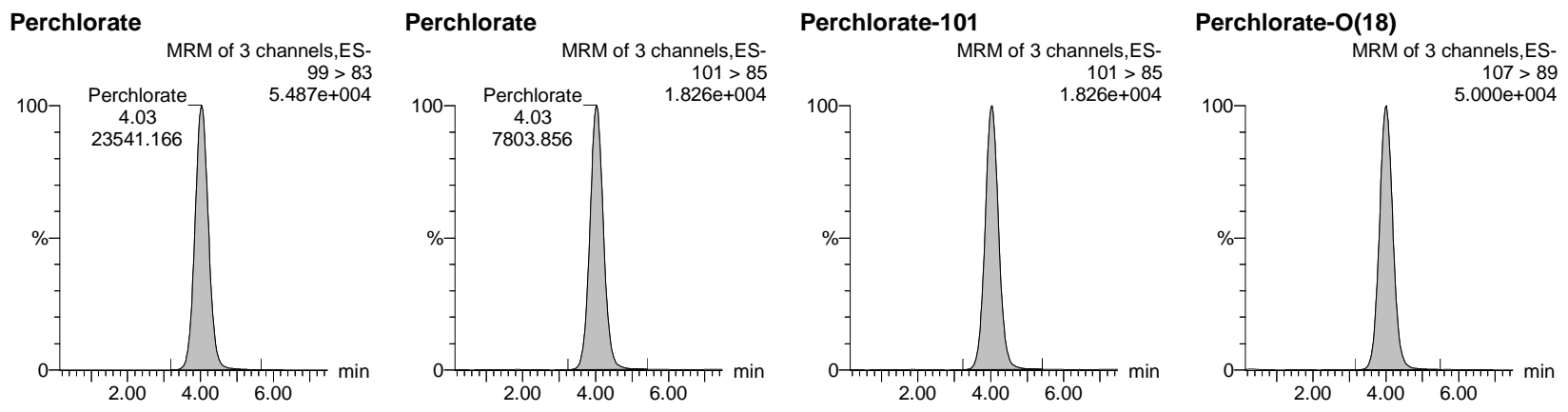


ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-03	Perchlorate	99 > 83	4.03	11536.862	0.260	bb			0.2404	96.15	-3.85	1159.4...	3.04
WCL170306-03	Perchlorate-101	101 > 85	4.03	3790.613	0.086	bb			0.2334	93.37	-6.63	543.651	
WCL170306-03	Perchlorate-O(18)	107 > 89	4.01	22145.072	22145.072	bb			0.5122	102.43	2.43	1814.1...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312006a
Date: 12-Mar-2017
Time: 13:38:17
ID: WCL170306-04
Vial: 1:1,E



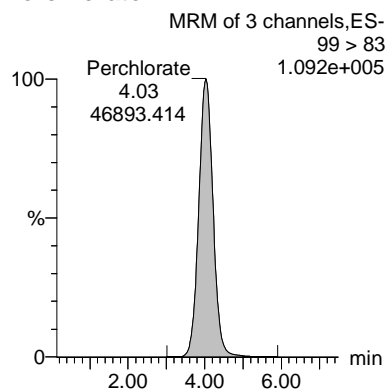
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-04	Perchlorate	99 > 83	4.03	23541.166	0.551	bb			0.5087	101.74	1.74	5488.8...	3.02
WCL170306-04	Perchlorate-101	101 > 85	4.03	7803.856	0.183	bb			0.4984	99.69	-0.31	1641.8...	
WCL170306-04	Perchlorate-O(18)	107 > 89	4.01	21351.205	21351.205	bb			0.4938	98.76	-1.24	1901.9...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

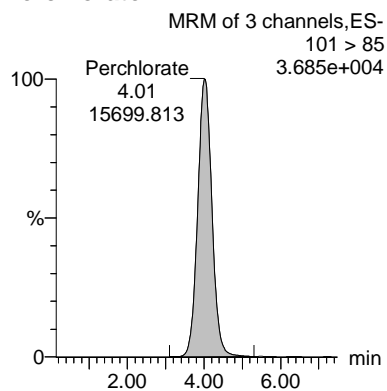
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312007a
Date: 12-Mar-2017
Time: 13:48:43
ID: WCL170306-05
Vial: 1:1,F

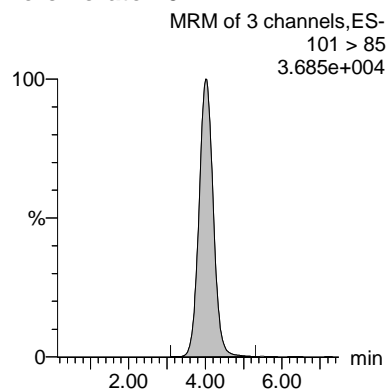
Perchlorate



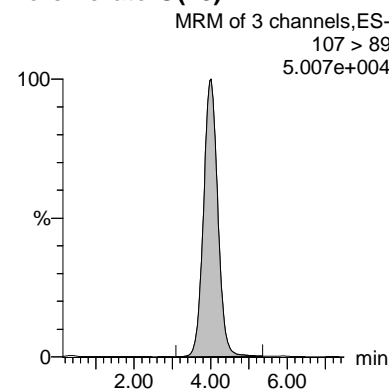
Perchlorate



Perchlorate-101



Perchlorate-O(18)

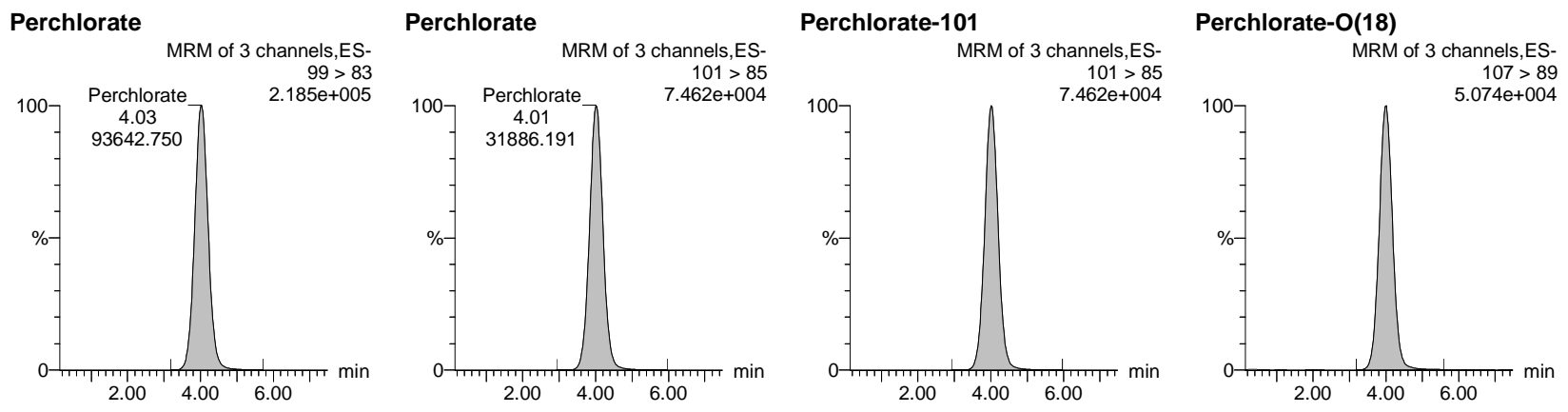


ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-05	Perchlorate	99 > 83	4.03	46893.414	1.097	bb			1.0123	101.23	1.23	4267.9...	2.99
WCL170306-05	Perchlorate-101	101 > 85	4.01	15699.813	0.367	bb			1.0018	100.18	0.18	1826.8...	
WCL170306-05	Perchlorate-O(18)	107 > 89	4.01	21372.748	21372.748	bb			0.4943	98.86	-1.14	2633.2...	

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312008a
Date: 12-Mar-2017
Time: 13:59:08
ID: WCL170306-06
Vial: 1:2,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-06	Perchlorate	99 > 83	4.03	93642.750	2.182	bb			2.0136	100.68	0.68	6219.6...	2.94
WCL170306-06	Perchlorate-101	101 > 85	4.01	31886.191	0.743	bb			2.0266	101.33	1.33	1603.5...	
WCL170306-06	Perchlorate-O(18)	107 > 89	4.01	21457.383	21457.383	bb			0.4963	99.25	-0.75	3448.1...	

Perchlorate Initial Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.5	100.15	12-MAR-17 14:20	per0312010a
Perchlorate Isotope Ratio		3		12-MAR-17 14:20	per0312010a
Perchlorate-101	.5	.49	98.71	12-MAR-17 14:20	per0312010a

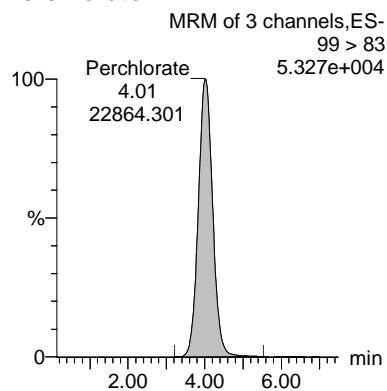
Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

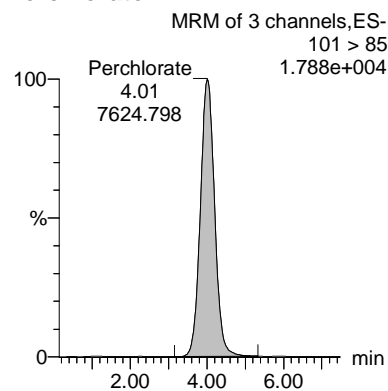
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312010a
Date: 12-Mar-2017
Time: 14:20:04
ID: WCL170306-07ICV
Vial: 1:2,B

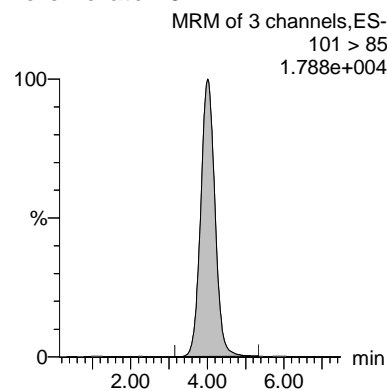
Perchlorate



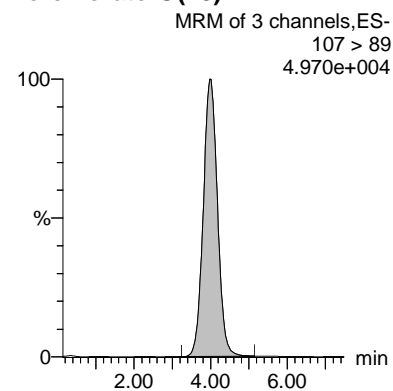
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07ICV	Perchlorate	99 > 83	4.01	22864.301	0.543	bb			0.5007	100.15	0.15	4417.3...	3.00
WCL170306-07ICV	Perchlorate-101	101 > 85	4.01	7624.798	0.181	bb			0.4936	98.71	-1.29	2459.3...	
WCL170306-07ICV	Perchlorate-O(18)	107 > 89	3.98	21067.604	21067.604	bb			0.4872	97.45	-2.55	1615.7...	

Perchlorate Continuing Calibration Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELReporting Units: ug/L

Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.5	.5	100.35	12-MAR-17 16:04	per0312020a
Perchlorate Isotope Ratio		3.08		12-MAR-17 16:04	per0312020a
Perchlorate-101	.5	.48	96.24	12-MAR-17 16:04	per0312020a

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

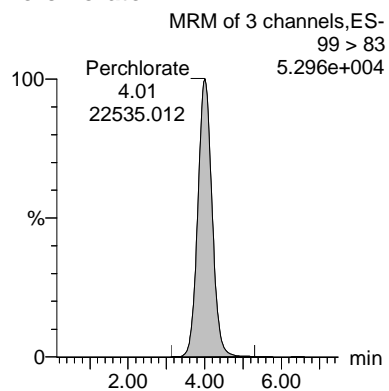
Page 20 of 21

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

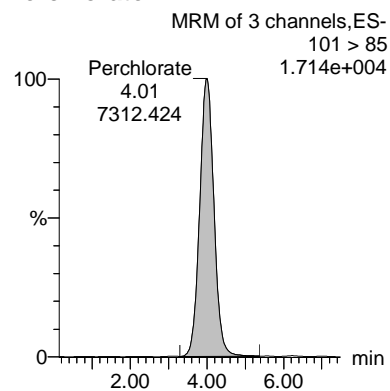
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312020a
Date: 12-Mar-2017
Time: 16:04:35
ID: WCL170306-07CCV
Vial: 1:2,B

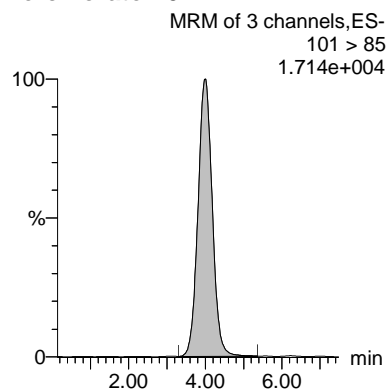
Perchlorate



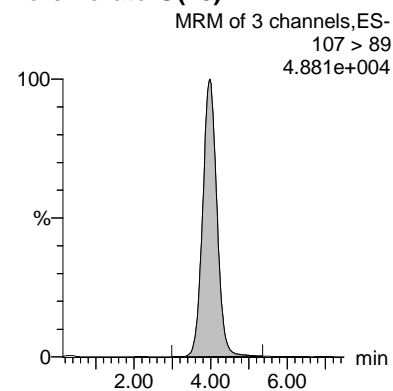
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-07CCV	Perchlorate	99 > 83	4.01	22535.012	0.544	bb			0.5017	100.35	0.35	1842.2...	3.08
WCL170306-07CCV	Perchlorate-101	101 > 85	4.01	7312.424	0.176	bb			0.4812	96.24	-3.76	1430.4...	
WCL170306-07CCV	Perchlorate-O(18)	107 > 89	3.98	20723.016	20723.016	bb			0.4793	95.85	-4.15	5695.1...	

Perchlorate MDL Verification

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELReporting Units: ug/L

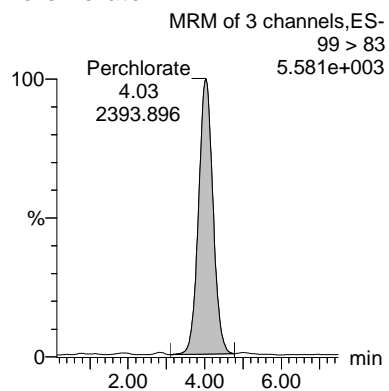
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id
Perchlorate	.05	.05	103.53	12-MAR-17 14:40	per0312012a
Perchlorate Isotope Ratio		3.15		12-MAR-17 14:40	per0312012a
Perchlorate-101	.05	.05	97.1	12-MAR-17 14:40	per0312012a
Perchlorate	.05	.05	102.13	12-MAR-17 16:25	per0312022a
Perchlorate Isotope Ratio		2.84		12-MAR-17 16:25	per0312022a
Perchlorate-101	.05	.05	106.38	12-MAR-17 16:25	per0312022a

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

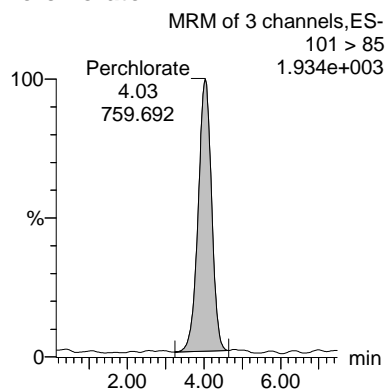
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312012a
Date: 12-Mar-2017
Time: 14:40:58
ID: WCL170306-08CRI
Vial: 1:2,C

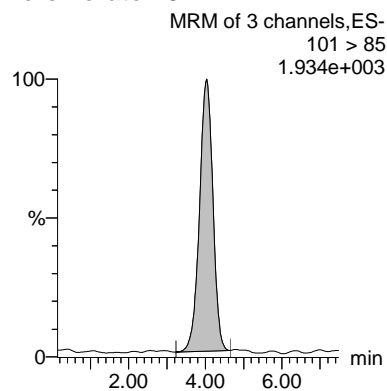
Perchlorate



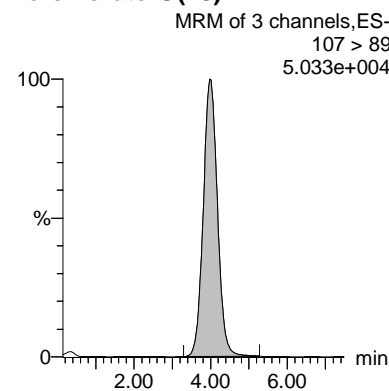
Perchlorate



Perchlorate-101



Perchlorate-O(18)



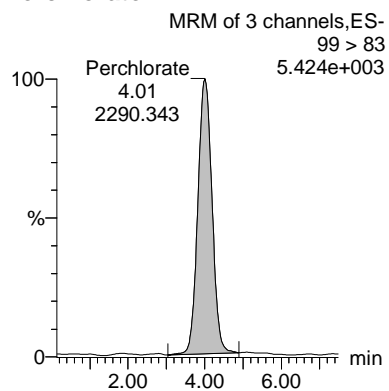
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	4.03	2393.896	0.056	bb			0.0518	103.53	3.53	272.003	3.15
WCL170306-08CRI	Perchlorate-101	101 > 85	4.03	759.692	0.018	bb			0.0486	97.10	-2.90	165.859	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.98	21338.277	21338.277	bb			0.4935	98.70	-1.30	2768.4...	

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

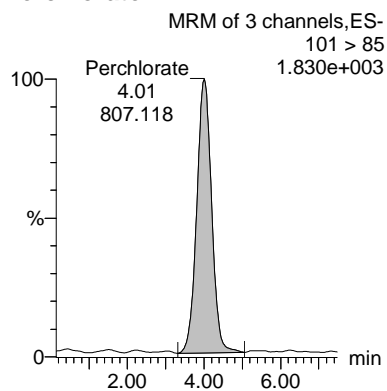
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312022a
Date: 12-Mar-2017
Time: 16:25:30
ID: WCL170306-08CRI
Vial: 1:2,C

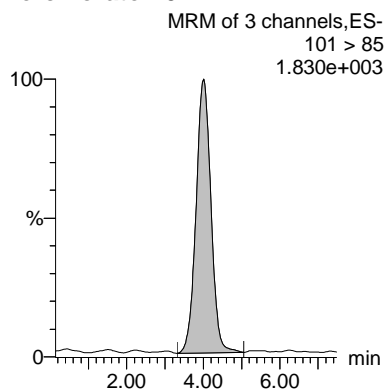
Perchlorate



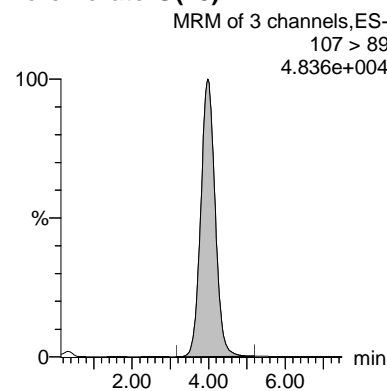
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
WCL170306-08CRI	Perchlorate	99 > 83	4.01	2290.343	0.055	bb			0.0511	102.13	2.13	310.821	2.84
WCL170306-08CRI	Perchlorate-101	101 > 85	4.01	807.118	0.020	bb			0.0532	106.38	6.38	303.681	
WCL170306-08CRI	Perchlorate-O(18)	107 > 89	3.98	20693.322	20693.322	bb			0.4786	95.72	-4.28	2424.6...	

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1646613Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 12-MAR-17GEL Job No (SDG): 1703069-01AGEL Sample ID: 1203745347Date Filtered: 12-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	12-MAR-17 14:51	per0312013a
	Perchlorate-O(18)			0.502	ug/L		1	12-MAR-17 14:51	per0312013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

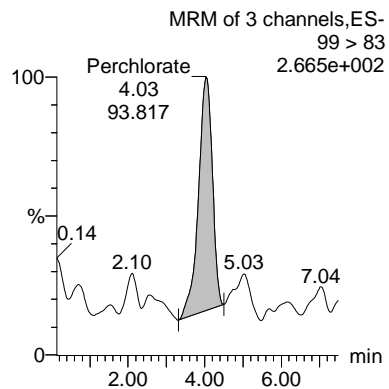
$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

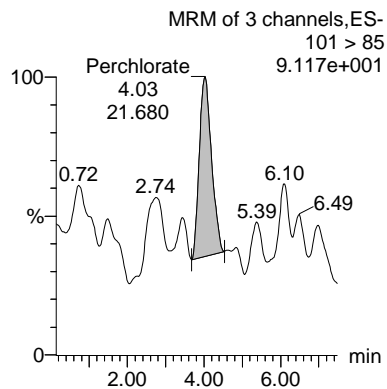
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
 Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312013a
Date: 12-Mar-2017
Time: 14:51:26
ID: 1203745347
Vial: 1:3,A

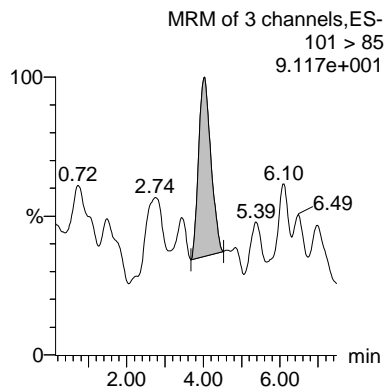
Perchlorate



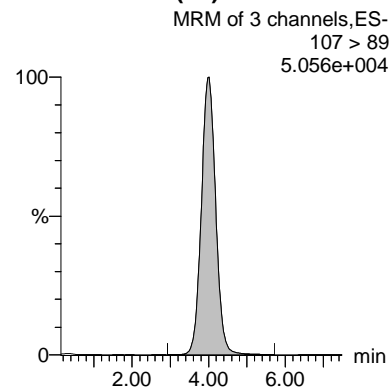
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203745347	Perchlorate	99 > 83	4.03	93.817	0.002	bb			0.0020			9.587 4.33
1203745347	Perchlorate-101	101 > 85	4.03	21.680	0.000	bb			0.0014			7.478
1203745347	Perchlorate-O(18)	107 > 89	4.01	21694.504	21694.504	bb			0.5017	100.35	0.35	1675.9...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Lab Code: GEL

Instrument: LCMSMS

Method: EPA 6850 Modified

Matrix: WATER

Extraction Batch ID: 1646613

Extraction Type: Filter/DAI

Sample Volume/Weight: 10.0 mL

Concentrated Extract Volume: 10.0

Client Sample No.

LCS

Date Received: 12-MAR-17

GEL Job No (SDG): 1703069-01A

GEL Sample ID: 1203745348

Date Filtered: 12-MAR-17

Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.199	ug/L	J	1	12-MAR-17 15:01	per0312014a
	Perchlorate-O(18)			0.487	ug/L		1	12-MAR-17 15:01	per0312014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

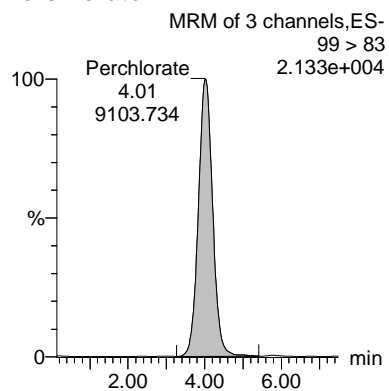
Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

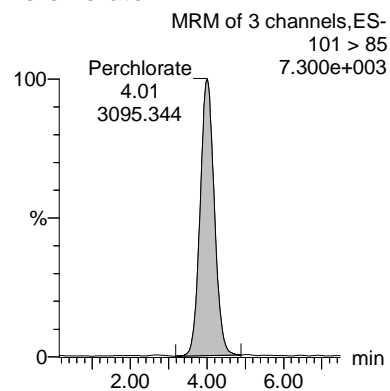
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312014a
Date: 12-Mar-2017
Time: 15:01:53
ID: 1203745348
Vial: 1:3,B

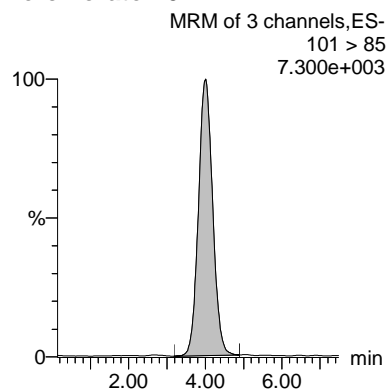
Perchlorate



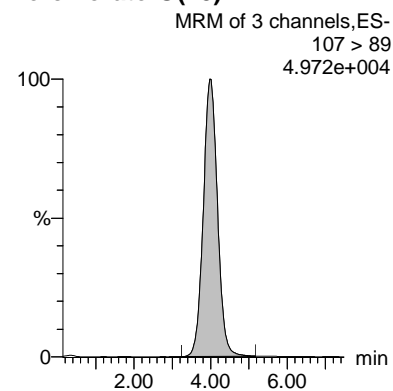
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
1203745348	Perchlorate	99 > 83	4.01	9103.734	0.216	bb			0.1993	99.66	-0.34	1019.2...
1203745348	Perchlorate-101	101 > 85	4.01	3095.344	0.073	bb			0.2003	100.15	0.15	791.647
1203745348	Perchlorate-O(18)	107 > 89	3.98	21074.053	21074.053	bb			0.4874	97.48	-2.52	1618.5...

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

ICSLab Code: GEL

Date Received:

Instrument: LCMSMSGEL Job No (SDG): 1703069-01AMethod: SW846 6850 ModifiedGEL Sample ID: 1203745351Matrix: WATERDate Filtered: 12-MAR-17Extraction Batch ID: 1646613Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids:

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.199	ug/L	J	1	12-MAR-17 15:12	per0312015a
	Perchlorate-O(18)			0.521	ug/L		1	12-MAR-17 15:12	per0312015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

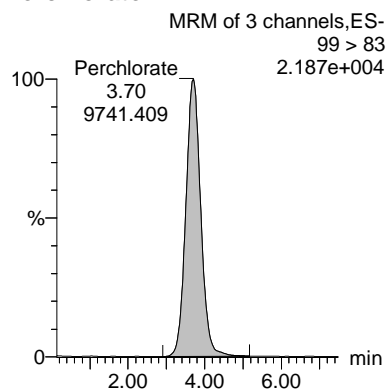
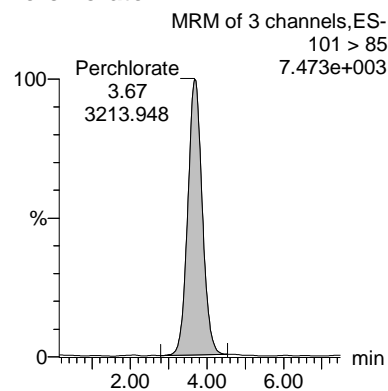
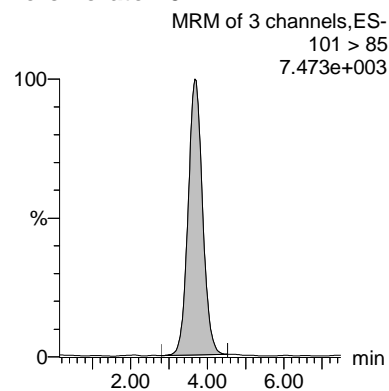
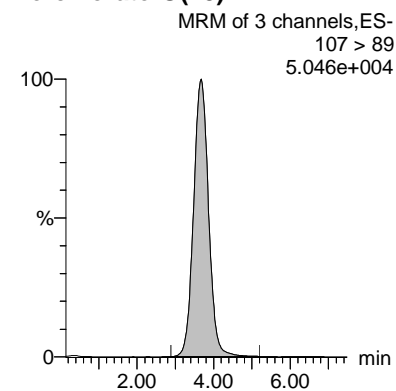
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 15 of 21

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312015a
Date: 12-Mar-2017
Time: 15:12:21
ID: 1203745351
Vial: 1:3,C

Perchlorate**Perchlorate****Perchlorate-101****Perchlorate-O(18)**

ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203745351	Perchlorate	99 > 83	3.70	9741.409	0.216	bb			0.1995	99.73	-0.27	3430.0...	3.03
1203745351	Perchlorate-101	101 > 85	3.67	3213.948	0.071	bb			0.1945	97.26	-2.74	682.024	
1203745351	Perchlorate-O(18)	107 > 89	3.67	22533.484	22533.484	bb			0.5211	104.23	4.23	1892.9...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1646613Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6421MSDate Received: 11-MAR-17GEL Job No (SDG): 1703069-01AGEL Sample ID: 1203745349Date Filtered: 12-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.23	ug/L		1	12-MAR-17 15:33	per0312017a
	Perchlorate-O(18)			0.484	ug/L		1	12-MAR-17 15:33	per0312017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

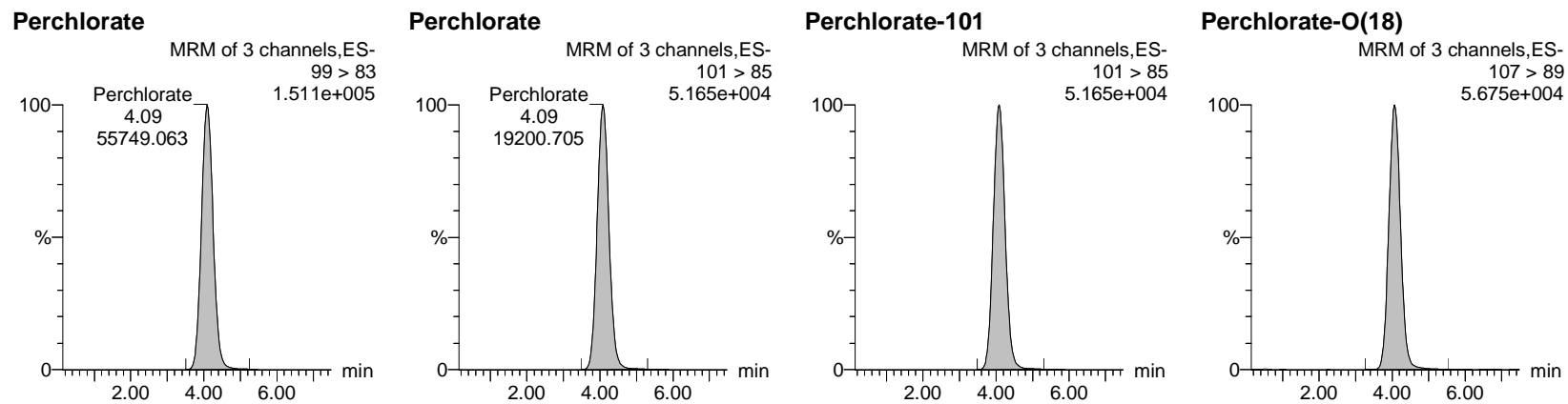
*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
 Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312017a
Date: 12-Mar-2017
Time: 15:33:15
ID: 1203745349
Vial: 1:3,E



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203745349	Perchlorate	99 > 83	4.09	55749.063	1.333	bb			1.2300	614.99	514.99	11625....	2.90
1203745349	Perchlorate-101	101 > 85	4.09	19200.705	0.459	bb			1.2521	626.05	526.05	9468.3...	
1203745349	Perchlorate-O(18)	107 > 89	4.06	20912.650	20912.650	bb			0.4837	96.73	-3.27	2343.2...	

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1646613Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LH18/24-SP650-6421MSDDate Received: 11-MAR-17GEL Job No (SDG): 1703069-01AGEL Sample ID: 1203745350Date Filtered: 12-MAR-17Injection Volume (uL): 20

%Solids: .

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.24	ug/L		1	12-MAR-17 15:43	per0312018a
	Perchlorate-O(18)			0.490	ug/L		1	12-MAR-17 15:43	per0312018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

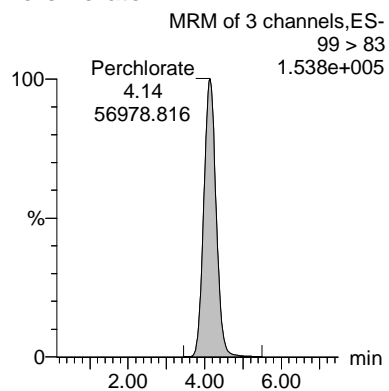
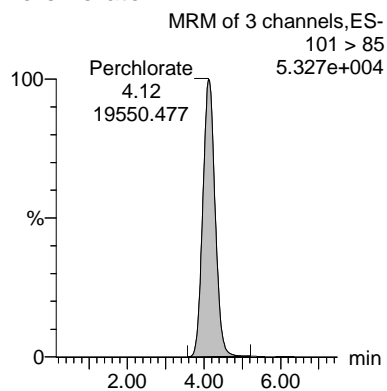
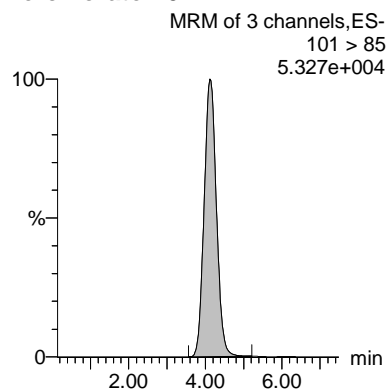
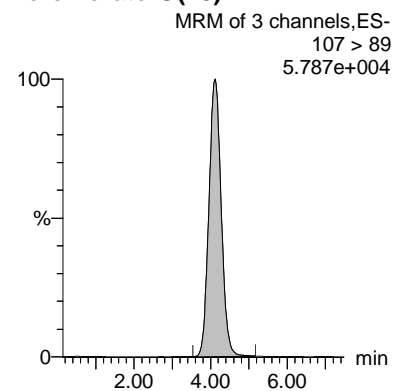
Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

Page 13 of 21

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312018a
Date: 12-Mar-2017
Time: 15:43:41
ID: 1203745350
Vial: 1:3,F

Perchlorate**Perchlorate****Perchlorate-101****Perchlorate-O(18)**

ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N	Ion Ratio
1203745350	Perchlorate	99 > 83	4.14	56978.816	1.345	bb			1.2408	620.41	520.41	5362.6...	2.91
1203745350	Perchlorate-101	101 > 85	4.12	19550.477	0.461	bb			1.2584	629.20	529.20	10059....	
1203745350	Perchlorate-O(18)	107 > 89	4.12	21187.199	21187.199	bb			0.4900	98.00	-2.00	4402.2...	

Perchlorate Initial Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELReporting Units: ug/L

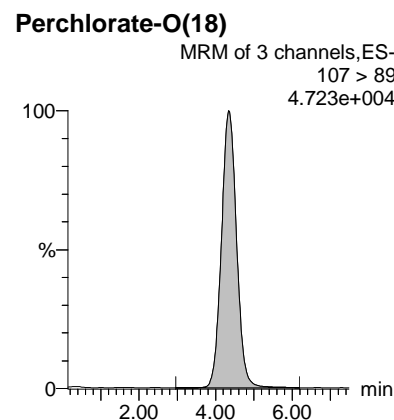
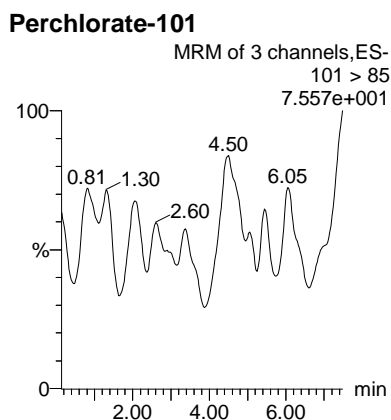
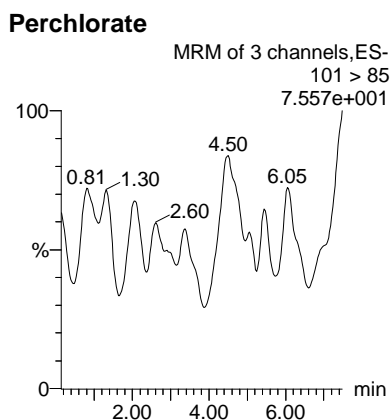
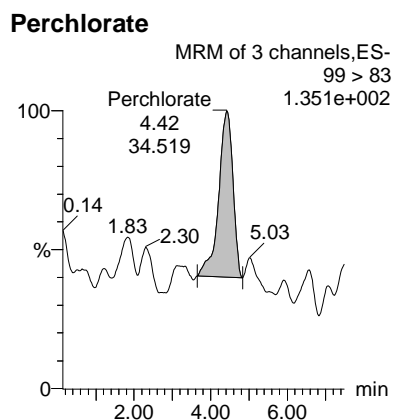
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	12-MAR-17	per0312001a	IPB001
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312001a	IPB001
Perchlorate	0.00	0	NA	12-MAR-17	per0312002a	IPB001
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312002a	IPB001

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Method: C:\MassLynx\Perchlorate.PRO\MethDB\per031217a.mdb 12 Mar 2017 17:01:05
Calibration: C:\MassLynx\Perchlorate.PRO\CurveDB\per031217a.cdb 13 Mar 2017 09:51:17

Name: per0312001a
Date: 12-Mar-2017
Time: 12:45:54
ID: IPB001
Vial: 1:1,A



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	4.42	34.519	0.001	bb			0.0007			9.831 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	4.34	21458.355	21458.355	bb			0.4963	99.26	-0.74	1964.3...

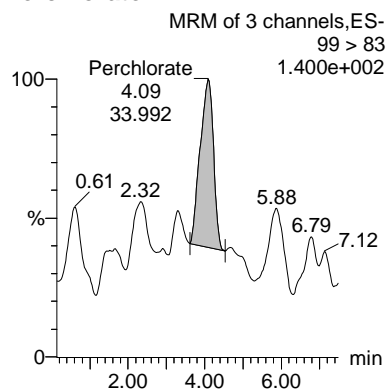
Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld

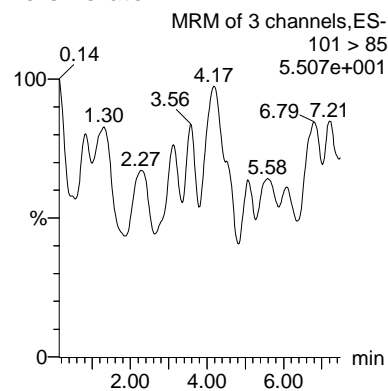
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312002a
Date: 12-Mar-2017
Time: 12:56:26
ID: IPB001
Vial: 1:1,A

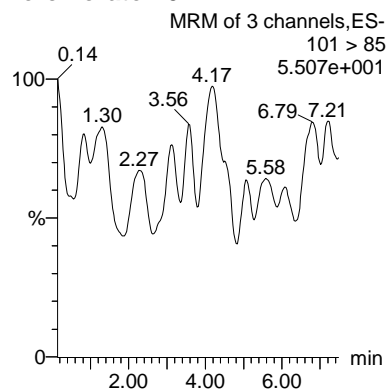
Perchlorate



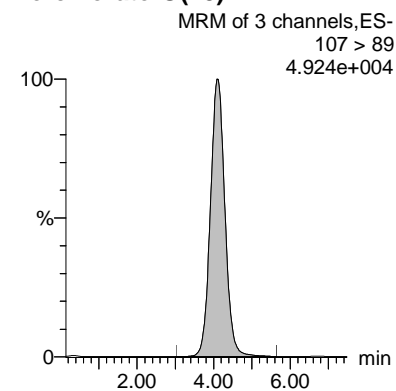
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB001	Perchlorate	99 > 83	4.09	33.992	0.001	bb			0.0007			4.142 0.00
IPB001	Perchlorate-101	101 > 85										
IPB001	Perchlorate-O(18)	107 > 89	4.09	21360.387	21360.387	bb			0.4940	98.80	-1.20	2431.1...

Perchlorate Continuing Calibration Blank

Lab Name: General Engineering LaboratoriesGEL Job No.(SDG): 1703069-01ALab Code: GELReporting Units: ug/L

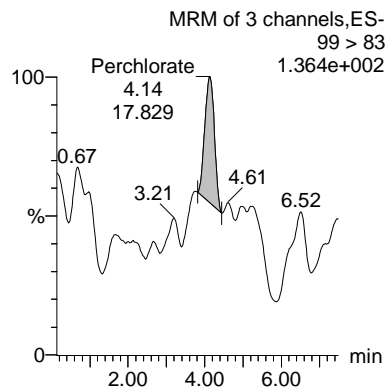
Analyte	True	Found	%Rec	Date Analyzed	GEL File Id	GEL Sample ID
Perchlorate	0.00	0	NA	12-MAR-17	per0312009a	IPB002
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312009a	IPB002
Perchlorate	0.00	0	NA	12-MAR-17	per0312011a	IPB003
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312011a	IPB003
Perchlorate	0.00	0	NA	12-MAR-17	per0312019a	IPB004
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312019a	IPB004
Perchlorate	0.00	0	NA	12-MAR-17	per0312021a	IPB005
Perchlorate-101	0.00	0	NA	12-MAR-17	per0312021a	IPB005

Quantify Sample Report MassLynx 4.0 SP4
The GEL Group, LLC Analyst: Grace L. Cappelmann

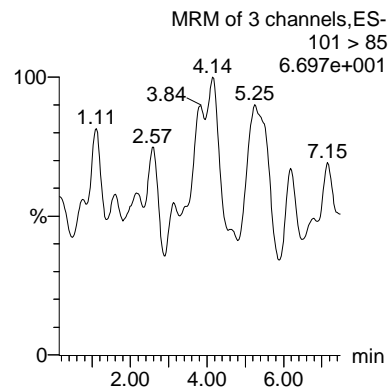
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312009a
Date: 12-Mar-2017
Time: 14:09:36
ID: IPB002
Vial: 1:1,A

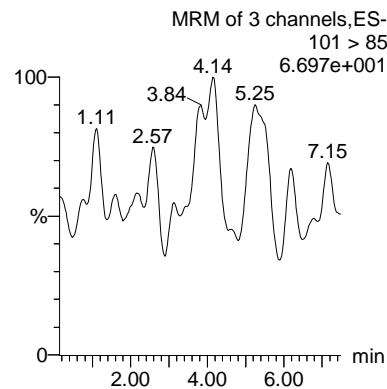
Perchlorate



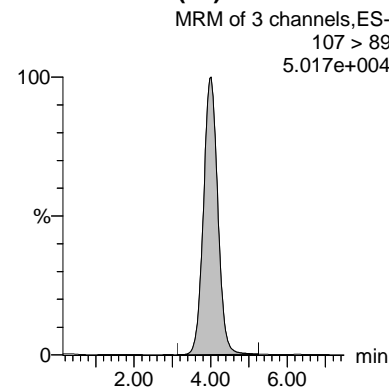
Perchlorate



Perchlorate-101



Perchlorate-O(18)



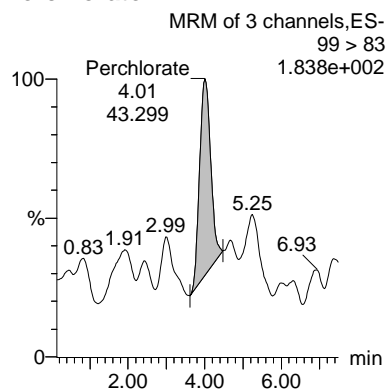
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB002	Perchlorate	99 > 83	4.14	17.829	0.000	bb			0.0004			3.395 0.00
IPB002	Perchlorate-101	101 > 85										
IPB002	Perchlorate-O(18)	107 > 89	4.01	21465.113	21465.113	bb			0.4964	99.29	-0.71	2016.8...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

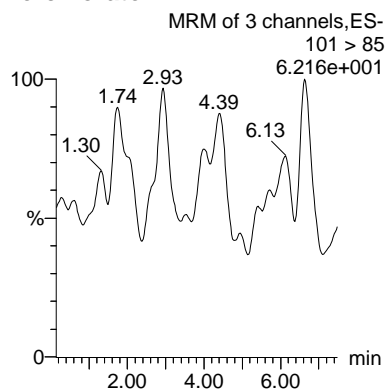
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312011a
Date: 12-Mar-2017
Time: 14:30:31
ID: IPB003
Vial: 1:1,A

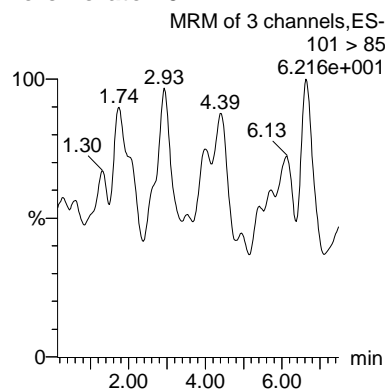
Perchlorate



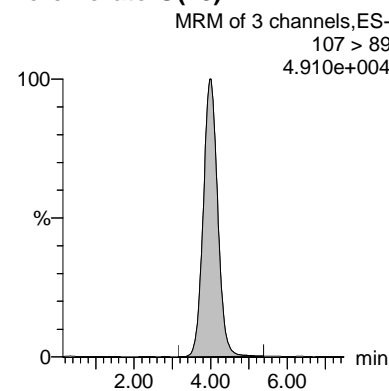
Perchlorate



Perchlorate-101



Perchlorate-O(18)



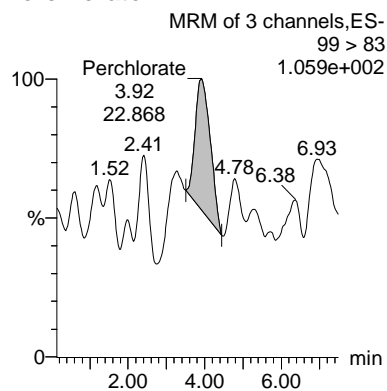
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB003	Perchlorate	99 > 83	4.01	43.299	0.001	bb			0.0009			7.750 0.00
IPB003	Perchlorate-101	101 > 85										
IPB003	Perchlorate-O(18)	107 > 89	4.01	21204.703	21204.703	bb			0.4904	98.08	-1.92	1461.1...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

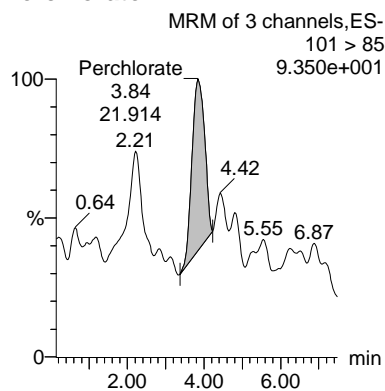
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
 Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312019a
Date: 12-Mar-2017
Time: 15:54:07
ID: IPB004
Vial: 1:1,A

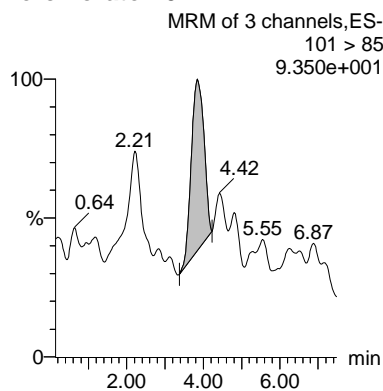
Perchlorate



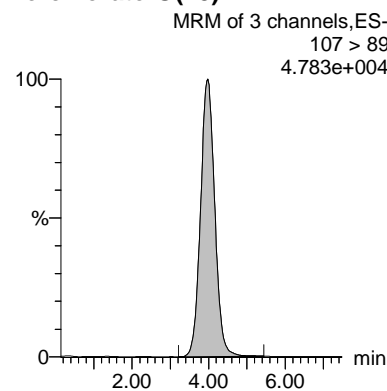
Perchlorate



Perchlorate-101



Perchlorate-O(18)



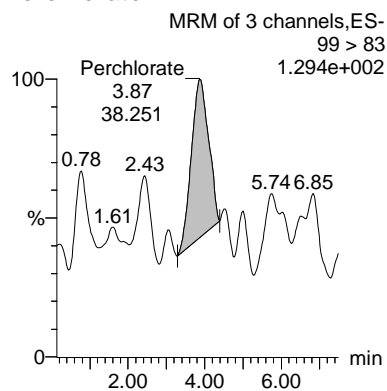
ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB004	Perchlorate	99 > 83	3.92	22.868	0.001	bb			0.0005			3.888 1.04
IPB004	Perchlorate-101	101 > 85	3.84	21.914	0.001	bb			0.0015			5.962
IPB004	Perchlorate-O(18)	107 > 89	3.98	20316.273	20316.273	bb			0.4699	93.97	-6.03	4342.2...

Quantify Sample Report MassLynx 4.0 SP4
 The GEL Group, LLC Analyst: Grace L. Cappelmann

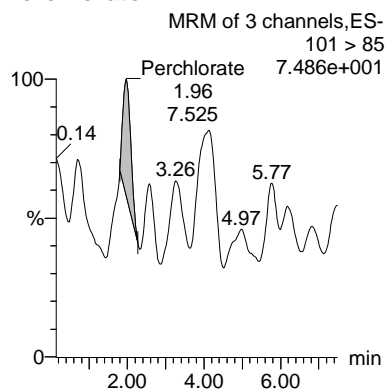
Dataset: C:\MassLynx\Perchlorate.PRO\per031217a.qld
 Last Altered: Monday, March 13, 2017 9:51:17 AM Eastern Daylight Time
 Printed: Monday, March 13, 2017 10:00:41 AM Eastern Daylight Time

Name: per0312021a
 Date: 12-Mar-2017
 Time: 16:15:02
 ID: IPB005
 Vial: 1:1,A

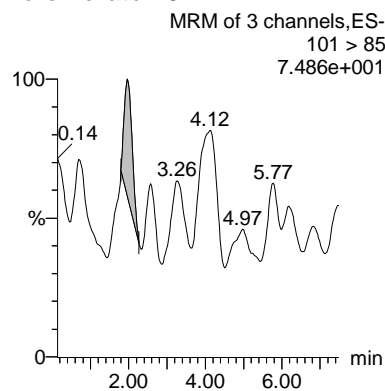
Perchlorate



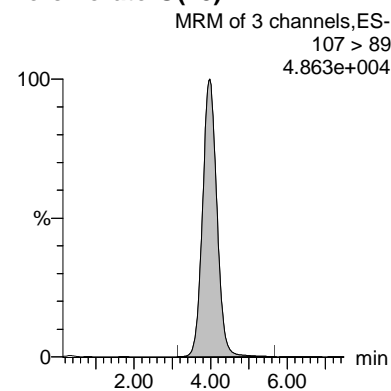
Perchlorate



Perchlorate-101



Perchlorate-O(18)



ID	Name	Trace	RT	Area	Response	Flags	Mod.Date	Mod.Time	ng/mL	%Rec	%Error	S/N Ion Ratio
IPB005	Perchlorate	99 > 83	3.87	38.251	0.001	bb			0.0008			2.066 5.08
IPB005	Perchlorate-101	101 > 85	1.96	7.525	0.000	bb			0.0005			2.557
IPB005	Perchlorate-O(18)	107 > 89	3.98	20853.471	20853.471	bb			0.4823	96.46	-3.54	3736.5...

Miscellaneous

Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)

Batch ID: 1646613 **Verified by:** _____
Analyst: Charles Wilson
Method: SW846 6850 Modified

Lab SOP: GL-OA-E-067 REV# 14
Instrument: LCMSMS Manual Instrument

Sample ID	Prep Date	Initial Volume (mL)	Final Volume (mL)	Prepped Factor (mL/mL)
1203745347 MB	12-MAR-2017 11:48:00	10	10	1
1203745348 LCS	12-MAR-2017 11:48:00	10	10	1
1203745351 ICS	12-MAR-2017 11:48:00	10	10	1
418362001	12-MAR-2017 11:48:00	10	10	1
1203745349 MS (418362001)	12-MAR-2017 11:48:00	10	10	1
1203745350 MSD (418362001)	12-MAR-2017 11:48:00	10	10	1

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
ICS	1203745351	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
LCS	1203745348	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MS	1203745349	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
MSD	1203745350	10 ug/L ICV/CCV Second Source	UCL161229-01.1	.2	mL	
RGNT	All	TYPE I Water for HPLC	2457559	10	mL	
RGNT	All	500 ppm Carbonate, Bicarbonate, Chloride, Sulfate	2463729	10	mL	

GEL ORGANIC RUN LOG

INSTRUMENT ID: LC-MS/MS#2

Date: 03/12/17

Method: EPA 6850-Modified

Extr. Injection Volume: 20uL

Int. Std.: UCL161103-01

Sequence Number: per031217a

Mobile Phase Lot#: 2523118, 2457559

Initial Calibration Date: 03/12/17

Standard-Samp Reagent Lot#:: 2457559

SOP: GL-OA-E-067

Alt Check Std. ID: WCL170306-07

DataFile	Sample	Analyst	Injection Date	Batch	SDG	Dilution	Client	Comments	QC_Flag
per0312001a	IPB001	GXC1	3/12/2017 12:45			1		USE	B
per0312002a	IPB001	GXC1	3/12/2017 12:56			1		USE	B
per0312003a	WCLICAL-01	GXC1	3/12/2017 13:06			1		USE	I
per0312004a	WCLICAL-02	GXC1	3/12/2017 13:17			1		USE	I
per0312005a	WCLICAL-03	GXC1	3/12/2017 13:27			1		USE	I
per0312006a	WCLICAL-04	GXC1	3/12/2017 13:38			1		USE	I
per0312007a	WCLICAL-05	GXC1	3/12/2017 13:48			1		USE	I
per0312008a	WCLICAL-06	GXC1	3/12/2017 13:59			1		USE	I
per0312009a	IPB002	GXC1	3/12/2017 14:09			1		USE	B
per0312010a	WCLICV	GXC1	3/12/2017 14:20			1		USE	C
per0312011a	IPB003	GXC1	3/12/2017 14:30			1		USE	B
per0312012a	WCLCRI	GXC1	3/12/2017 14:40			1		USE	C
per0312013a	1203745347	GXC1	3/12/2017 14:51	1646614	1703069-01 A	1	MBAC	USE	S
per0312014a	1203745348	GXC1	3/12/2017 15:01	1646614	1703069-01 A	1	MBAC	USE	S
per0312015a	1203745351	GXC1	3/12/2017 15:12	1646614	1703069-01 A	1	MBAC	USE	S
per0312016a	418362001	GXC1	3/12/2017 15:22	1646614	1703069-01 A	1	MBAC	USE	S
per0312017a	1203745349	GXC1	3/12/2017 15:33	1646614	1703069-01 A	1	MBAC	USE	S
per0312018a	1203745350	GXC1	3/12/2017 15:43	1646614	1703069-01 A	1	MBAC	USE	S
per0312019a	IPB004	GXC1	3/12/2017 15:54			1		USE	B
per0312020a	WCLCCV	GXC1	3/12/2017 16:04			1		USE	C
per0312021a	IPB005	GXC1	3/12/2017 16:15			1		USE	B
per0312022a	WCLCRI	GXC1	3/12/2017 16:25			1		USE	C

Isotope Ratio Criteria

Isotope Ratio $^{35}\text{Cl}/^{37}\text{Cl}$

2.31-3.85

Tune Criteria

The tuning solution is introduced directly into the mass spectrometer using the ESI interface in the positive ion mode. The mass range scanned is 20 to 1100 amu using at least six scans. The observed mass for the target compound in the daily calibration standards must be within 0.2 amu of the expected value. If it is greater than 0.2 amu, then a mass calibration is performed and the instrument is re-calibrated.

**ANALYTICAL DATA PACKAGE**

SDG # 1703094

PROJECT NAME: Longhorn**SUBMITTAL TO:**

Adriane Steed
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, OH 45750

SUBMITTAL BY:

Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (866)417-0548

LABORATORY CONTACT PERSON:

Project Manager: Sonya Gordon
Tel (615)345-1115
Fax (866)417-0548
Email: sgordon@empirlabs.com

Original Report Date: March 22, 2017

Report Revision #: N/A

Revision Date: N/A

THIS DOCUMENT MEETS DoD QSM 5.0 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Data Review Manager, Ms. Amy Barnett, is responsible for the final data produced and reported. Her signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

L-A-B Accredited - Certificate Number L2226 - Testing

Table of Contents

#	Description
1	Cover Page
2	Table of Contents
3	Case Narrative
4	Sample Receipt Information Chain of Custody Forms Sample Receipt Confirmations WorkOrder Summary Sample Delivery Group (SDG) Sheets
5	Data for Perchlorate Required Data / QAQC / Calibration Forms Supporting Raw Data / Logs

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

This is an original submittal of the final report package.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

Perchlorate:

Note – Sample 1703094-01 was analyzed at a 20x due to sample matrix.

The following internal standards exceeded criteria:

Perchlorate-d18 with a negative bias in 1703094-01; note – the sample was not able to be re-analyzed due to sample matrix

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- DL:** The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 5.0 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 5.0 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** Exceeding quality control criteria are associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.
- H:** The result was analyzed, extracted, or received outside of the EPA recommended holding time.
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte and that the analyte's DL/LOD/LOQ have been raised.

- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported. If there is greater than a 100% difference indicated on the form 10, the lower of the two values is reported.
- Q:** The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Calibration Verification, internal standard, Blank Spike and/or Blank Spike Duplicate.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or co-elution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.
- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase

incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Ms. Amy M. Barnett
Data Review Manager

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 01/18/2017)

00842094

DoD ELAP QSM5.0, Certificate Number L2226

- Aqueous
- Non-aqueous
- Expires: 11/30/2018

State of Florida, Department of Health – NELAP Primary, Lab ID: E87646

- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2017

State of Georgia, Environmental Protection Agency – NELAP, Self Certification

- Expires: 06/30/2017

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017

- Wastewater
- Expires: 12/31/2017

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77

- Aqueous
- Non-aqueous
- Expires: 06/30/2017

State of New Jersey, Department of Environmental Protection – NELAP, Lab ID: TN473

- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2017

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-16-14

- Aqueous
- Non-aqueous
- Expires: 12/31/2017

State of Utah, Department of Health – NELAP, Certificate Number: TN0042016-8

- Aqueous
- Non-aqueous
- Expires: 07/31/2017

**Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 8924,
Lab ID: 460243**

- Aqueous
- Non-aqueous
- Expires: 12/14/2017

State of Washington, Department of Ecology – NELAP, Lab ID: C934-16

- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2017

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg)} * \text{Expected Vol/Weight (mL or g)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL)} * \text{Final Vol (ml)} * \text{Dilution} * (1000\text{uL/mL})}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL)} * \text{Final Vol (mL)} * \text{Dilution}}{\text{Initial Vol/Weight (mL or g)} * (\text{Percent Solids}/100) \text{ (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Sample Receipt Information



1703094-01 A

CHAIN OF CUSTODY

Page 1 of 1

L (615) 345-1115 ATTN: SONYA GORDON

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. 60256135.GWTPT HRUMAR16																																																																																								
Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES																																																																																											
Prepared By: Scott Beesinger			P.O. Number																																																																																								
Field Sample I.D. LH18/24-SP650-6422-Grab		Sample Matrix Water	Date / Time 03/08/17 / 15:00	MS / MSD	No. OF CONTAINERS																																																																																						
<table border="1"> <thead> <tr> <th colspan="6">ANALYSES</th> <th rowspan="2">REMARKS (Preservatives, etc.)</th> <th rowspan="2">Lab I.D.#</th> </tr> <tr> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>PERCHLORATE</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						ANALYSES						REMARKS (Preservatives, etc.)	Lab I.D.#									PERCHLORATE	X																																																																				
ANALYSES						REMARKS (Preservatives, etc.)	Lab I.D.#																																																																																				
		PERCHLORATE	X																																																																																								

Additional Remarks: **STANDARD TAT**

Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By: <i>Scott Beesinger</i>	Date 03/08/17	Time 15:30	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
---	-------------------------	----------------------	---------------------	-------------	-------------	-------------------------	-------------	-------------	---------------------	-------------	-------------

For Lab Use Only

Received At Lab By: <i>[Signature]</i>	Date 3/4/17	Time 955	Airbill No.	Opened By: JH	Date 3/8/17	Time 1015	Temp of Container 17	Seal No. Y	Condition Good
Remarks: Smp Labs									

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 3/9/17@0850-955

Work-order# 1709⁷⁴

1703094

- 1. Tracking # NA (last 4 digits, FedEx)
Courier: FedEx UPS
- 2. Temperature of rep. sample or temp blank when opened: 1.9 °C + correction factor ^{0.2} ~~(0.1)~~ = 1.7 °C
(Temp Fluke#1 SN17680086)
- 3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA
- 4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: 1 front
- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 3/9/17

- 7. Were custody seals on containers: YES NO and Intact YES...NO...NA
Were these signed and dated correctly? YES...NO...NA
- 8. Packing material used? Bubble-wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc.)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13. a. Were VOA vials received? YES NO...NA
b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA
- 14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments _____
If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 3/9/17

- 15. a. On preserved bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA
b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA
- 16. Was residual chlorine present for Cyanide "Effluent" samples? If so, treated/documented? YES...NO...NA
- 17. For 608 Pest/PCB samples, was pH <5 or >9? Was residual chlorine present? If either, adjusted/documented? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-17 (initial/date) TH 3/9/17

- 18. Were custody papers properly filled out (ink, signed, etc.)? YES...NO...NA
- 19. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 20. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA
- 21. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA
- 22. Were there Non-Conformance issues at login? YES...NO...NCR# _____

I certify that I entered this project into LIMS and answered questions 18-22 (initial/date) TH 3/9/17

I certify that I attached a unique LIMS number label with matching sample name to each container (initial/date) TH 3/9/17

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 3/9/17



Empirical Laboratories, LLC

WORK ORDER

1703094

Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn	Project Manager: Sonya Gordon Project Number: MIC_Perc
---	---

Report To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone: (740) 373-4071
 Fax: (740) 373-4835

Invoice To:

Microbac Laboratories, Inc.-Ohio Valley Division
 Adriane Steed
 158 Starlite Drive
 Marietta, OH 45750
 Phone : (740) 373-4071
 Fax: (740) 373-4835

Date Due: 03/23/2017 16:00 (10 day TAT)

Date Received: 03/09/2017 09:55

Logged In By: Tiana L. Hutchings

Received By: Tiana L. Hutchings

Samples Received at: 1.7°C					
Custody seals on the o	Yes	Samples received on i	Yes	Any headspace in vials	No
All containers in good	Yes	Custody seals intact?	Yes	Trip blank received?	No
Did the containers mat	Yes	Proper packing materi	Yes	Cyanide Effluent samp	No
Preserved containers a	No	VOA vials received?	No	608 Pest/PCB sample:	No

Analysis	TAT	Expires	Version	Comments
1703094-01 LH18/24-SP650-6422-Grab [Water] Sampled 03/08/2017				
15:00 (GMT-06:00) Central Time (US & Canada)				
LCMS_PERC_6850_Q5	10	04/05/2017 15:00		

Sample Delivery Group Assignment Form

CLIENT: Microbac Laboratories, Inc.-Ohio Valley Division
PROJECT NAME: Longhorn
SDG #: 1703094

QC LEVEL: Level IV
Report Due: 3/23/2017
Client Sample Count: 1

Sample Type	Sampled	Received	Lab ID	Client ID	Lab Matrix	SW6850
Client Sample	3/8/2017	3/9/2017	1703094-01	LH18/24-SP650-6422-Grab	Water	X

Forms For Perchlorates

Sample Extraction Data

Prep Method: PERC_6850_W-SW6850

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [mL]	Final [mL]	Dilution	% Solids	Notes	Date
1703094-01 [LH18/24-SP650-6422-Grab]	7C10018	10.00/10.00	10.0	10.0	20.00			03/10/17

ANALYSIS DATA SHEET

LH18/24-SP650-6422-Grab

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Vall Project: Longhorn
 Matrix: Water Laboratory ID: 1703094-01 File ID: PERC000011.D.Report.TXT
 Sampled: 03/08/17 15:00 Prepared: 03/10/17 13:45 Analyzed: 03/20/17 18:35
 Solids: Preparation: PERC 6850 W Dilution: 20
 Batch: 7C10018 Sequence: 7C07910 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		10.0	20.0	40.0	UQ

Total Target Analytes Reported 1 Project Analytes: 1

LCS / LCS DUPLICATE RECOVERY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Matrix: Water
Batch: 7C10018 Laboratory ID: 7C10018-BS1
Preparation: PERC_6850_W Initial/Final: 10 mL / 10 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Perchlorate	2.000	1.802	90.1	84 - 119

PREPARATION BATCH SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Batch: 7C10018 Batch Matrix: Water Preparation: PERC_6850_W

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
LH18/24-SP650-6422-Grab	1703094-01	03/10/17 13:45	10.00	10.00
Blank	7C10018-BLK1	03/10/17 13:45	10.00	10.00
LCS	7C10018-BS1	03/10/17 13:45	10.00	10.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7C10018-BLK1 File ID: PERC000015.D.Report.TXT
 Sampled: Prepared: Analyzed: 03/17/17 14:14
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7C10018 Sequence: 7C07604 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate		0.500	1.00	2.00	U

Total Target Analytes Reported: 1

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Matrix: Laboratory ID: 7C10018-BS1 File ID: PERC000016.D.Report.TXT
 Sampled: Prepared: Analyzed: 03/17/17 14:32
 Solids: Preparation: PERC 6850 W Dilution:
 Batch: 7C10018 Sequence: 7C07604 Calibration: 6144001 Instrument: LCMS1

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
14797-73-0	Perchlorate	1.802	0.500	1.00	2.00	J

Total Target Analytes Reported: 1

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 05/21/16
Instrument ID: LCMS1 Injection Time: 09:46
Sequence: 6E14115 Lab Sample ID: 6E14115-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 03/17/17
Instrument ID: LCMS1 Injection Time: 10:08
Sequence: 7C07604 Lab Sample ID: 7C07604-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Lab File ID: PERC000002.D.Report.TXT Injection Date: 03/20/17
Instrument ID: LCMS1 Injection Time: 15:45
Sequence: 7C07910 Lab Sample ID: 7C07910-TUN1

m/z	MASS CRITERIA	ACTUAL MASS	
83	99.7 - 100.3% of 83T	100	PASS
85	99.7 - 100.3% of 85T	100	PASS

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7C07604

Lab Sample ID	Analyte	True	Found	%R	Units
7C07604-IFA1	Perchlorate-d18	5.000	5.00	67.6	ug/L
	Perchlorate	2.000	1.86	93.2	ug/L

INTERFERENCE CHECK SAMPLE**SW6850**Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisioProject: LonghornInstrument ID: LCMS1Calibration: 6144001Sequence: 7C07910

Lab Sample ID	Analyte	True	Found	%R	Units
7C07910-IFA1	Perchlorate-d18	5.000	5.00	69.6	ug/L
	Perchlorate	2.000	1.90	94.8	ug/L

ANALYSIS SEQUENCE SUMMARY

SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 6E14115 Instrument: LCMS1
 Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	6E14115-TUN1	PERC000002.D.Report.TXT	05/21/16 09:46
Cal Standard	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
Cal Standard	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
Cal Standard	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
Cal Standard	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
Cal Standard	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
Cal Standard	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
Cal Standard	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
Cal Standard	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44
Initial Cal Check	6E14115-ICV1	PERC000014.D.Report.TXT	05/21/16 13:20

ANALYSIS SEQUENCE SUMMARY**SW6850**

Laboratory: Empirical Laboratories, LLC SDG: 1703094
Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
Sequence: 7C07604 Instrument: LCMS1
Calibration: 6144001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	7C07604-TUN1	PERC000002.D.Report.TXT	03/17/17 10:08
Calibration Check	7C07604-CCV1	PERC000004.D.Report.TXT	03/17/17 10:46
Low Cal Check	7C07604-LCV1	PERC000007.D.Report.TXT	03/17/17 11:43
Interference Check A	7C07604-IFA1	PERC000008.D.Report.TXT	03/17/17 12:01
Blank	7C10018-BLK1	PERC000015.D.Report.TXT	03/17/17 14:14
LCS	7C10018-BS1	PERC000016.D.Report.TXT	03/17/17 14:32
Calibration Check	7C07604-CCV2	PERC000023.D.Report.TXT	03/17/17 16:44
Low Cal Check	7C07604-LCV2	PERC000024.D.Report.TXT	03/17/17 17:03

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7C07604 Instrument: LCMS1
 Calibration: 6144001

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Calibration Check (7C07604-CCV1)		Lab File ID: PERC000004.D.Report.TXT			Analyzed: 03/17/17 10:46	
Perchlorate-d18	2260790	8.62	2047316	110	50 - 150	
Low Cal Check (7C07604-LCV1)		Lab File ID: PERC000007.D.Report.TXT			Analyzed: 03/17/17 11:43	
Perchlorate-d18	2166580	8.44	2047316	106	50 - 150	
Interference Check A (7C07604-IFA1)		Lab File ID: PERC000008.D.Report.TXT			Analyzed: 03/17/17 12:01	
Perchlorate-d18	1528080	7.224	2047316	75	50 - 150	
Blank (7C10018-BLK1)		Lab File ID: PERC000015.D.Report.TXT			Analyzed: 03/17/17 14:14	
Perchlorate-d18	1981720	8.747	2047316	97	50 - 150	
LCS (7C10018-BS1)		Lab File ID: PERC000016.D.Report.TXT			Analyzed: 03/17/17 14:32	
Perchlorate-d18	1560300	8.816	2047316	76	50 - 150	
Calibration Check (7C07604-CCV2)		Lab File ID: PERC000023.D.Report.TXT			Analyzed: 03/17/17 16:44	
Perchlorate-d18	2075100	8.397	2047316	101	50 - 150	
Low Cal Check (7C07604-LCV2)		Lab File ID: PERC000024.D.Report.TXT			Analyzed: 03/17/17 17:03	
Perchlorate-d18	2044810	8.237	2047316	100	50 - 150	

INTERNAL STANDARD AREA AND RT SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLC SDG: 1703094
 Client: Microbac Laboratories, Inc.-Ohio Valley Division Project: Longhorn
 Sequence: 7C07910 Instrument: LCMS1
 Calibration: 6144001

Internal Standard	Response	RT	Response	Reference Area %	Area % Limits	Q
Low Cal Check (7C07910-LCV1)		Lab File ID: PERC000005.D.Report.TXT		Analyzed: 03/20/17 16:42		
Perchlorate-d18	2093080	8.601	2047316	102	50 - 150	
Calibration Check (7C07910-CCV1)		Lab File ID: PERC000006.D.Report.TXT		Analyzed: 03/20/17 17:00		
Perchlorate-d18	2098720	8.627	2047316	103	50 - 150	
Interference Check A (7C07910-IFA1)		Lab File ID: PERC000007.D.Report.TXT		Analyzed: 03/20/17 17:19		
Perchlorate-d18	1459760	7.393	2047316	71	50 - 150	
LH18/24-SP650-6422-Grab (1703094-01)		Lab File ID: PERC000011.D.Report.TXT		Analyzed: 03/20/17 18:35		
Perchlorate-d18	858113	6.462	2047316	42	50 - 150	*
Calibration Check (7C07910-CCV2)		Lab File ID: PERC000022.D.Report.TXT		Analyzed: 03/20/17 22:02		
Perchlorate-d18	2083380	8.504	2047316	102	50 - 150	
Low Cal Check (7C07910-LCV2)		Lab File ID: PERC000023.D.Report.TXT		Analyzed: 03/20/17 22:21		
Perchlorate-d18	2121230	8.572	2047316	104	50 - 150	

INITIAL CALIBRATION DATA

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:39 5/21/16 12:44

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	0.2	0.7845944	0.5	0.7849415	1	0.783103	2	0.8192946	5	0.8473028	10	0.8833049
Perchlorate (101)	0.2		0.5		1		2		5		10	
Perchlorate (85)	0.2	0.334203	0.5	0.290602	1	0.275233	2	0.2750875	5	0.2714884	10	0.2777807

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Perchlorate	20	0.928708	50	0.9971742								
Perchlorate (101)	20		50									
Perchlorate (85)	20	0.2935408	50	0.3188878								

INITIAL CALIBRATION DATA (Continued)

SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: LonghornCalibration: 6144001Instrument: LCMS1Matrix: SolidCalibration Dates: 5/21/16 10:395/21/16 12:44

Compound	Mean RF	RF RSD	Slope/QRA	Intercept/QR B	QR C	LR r/QRCOD	LIMIT	Q	Typ
Perchlorate	0.8535529	9.160918					20		A
Perchlorate (101)							20		A
Perchlorate (85)	0.2921029	7.869005					20		A

INITIAL CALIBRATION STANDARDS

SW6850

Laboratory:	Empirical Laboratories, LLC	SDG:	1703094
Client:	Microbac Laboratories, Inc.-Ohio Valley Division	Project:	Longhorn
Sequence:	6E14115	Instrument:	LCMS1
Calibration:	6144001		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
16D0528	Perchlorate Init Cal 0.2 ug/L	6E14115-CAL1	PERC000005.D.Report.TXT	05/21/16 10:39
16D0529	Perchlorate Init Cal 0.5 ug/L	6E14115-CAL2	PERC000006.D.Report.TXT	05/21/16 10:57
16D0530	Perchlorate Init Cal 1.0 ug/L	6E14115-CAL3	PERC000007.D.Report.TXT	05/21/16 11:15
16D0531	Perchlorate Init Cal 2.0 ug/L	6E14115-CAL4	PERC000008.D.Report.TXT	05/21/16 11:33
16D0532	Perchlorate Init Cal 5.0 ug/L	6E14115-CAL5	PERC000009.D.Report.TXT	05/21/16 11:50
16D0533	Perchlorate Init Cal 10 ug/L	6E14115-CAL6	PERC000010.D.Report.TXT	05/21/16 12:08
16D0534	Perchlorate Init Cal 20 ug/L	6E14115-CAL7	PERC000011.D.Report.TXT	05/21/16 12:26
16D0536	Perchlorate Init Cal 50 ug/L	6E14115-CAL8	PERC000012.D.Report.TXT	05/21/16 12:44

INITIAL CALIBRATION CHECK

SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703094</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000014.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>6E14115</u>	Injection Date:	<u>05/21/16</u>
Lab Sample ID:	<u>6E14115-ICV1</u>	Injection Time:	<u>13:20</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Perchlorate	A	5.000	4.824	0.8535529	0.8235756		-3.5	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703094</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000004.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV1</u>	Injection Time:	<u>10:46</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.646	0.8535529	0.7931741		-7.1	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703094</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000023.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07604</u>	Injection Date:	<u>03/17/17</u>
Lab Sample ID:	<u>7C07604-CCV2</u>	Injection Time:	<u>16:44</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.666	0.8535529	0.7965014		-6.7	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703094</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000006.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07910</u>	Injection Date:	<u>03/20/17</u>
Lab Sample ID:	<u>7C07910-CCV1</u>	Injection Time:	<u>17:00</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.650	0.8535529	0.7937409		-7.0	15

CONTINUING CALIBRATION CHECK
SW6850

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1703094</u>
Client:	<u>Microbac Laboratories, Inc.-Ohio Valley Division</u>	Project:	<u>Longhorn</u>
Instrument ID:	<u>LCMS1</u>	Calibration:	<u>6144001</u>
Lab File ID:	<u>PERC000022.D.Report.TXT</u>	Calibration Date:	<u>05/21/16 00:00</u>
Sequence:	<u>7C07910</u>	Injection Date:	<u>03/20/17</u>
Lab Sample ID:	<u>7C07910-CCV2</u>	Injection Time:	<u>22:02</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Perchlorate	A	5.000	4.612	0.8535529	0.7872592		-7.8	15

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703094**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV1**Sequence:** 7C07604**Standard ID:** 17C0170

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9923	-0.8	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703094**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07604-LCV2**Sequence:** 7C07604**Standard ID:** 17A0679

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.9837	-1.6	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703094**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07910-LCV1**Sequence:** 7C07910**Standard ID:** 17C0170

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.8598	-14.0	30.00

LOW-CONCENTRATION CALIBRATION VERIFICATION**SW6850****Laboratory:** Empirical Laboratories, LLC**SDG:** 1703094**Client:** Microbac Laboratories, Inc.-Ohio Valley Division**Project:** Longhorn**Calibration:** 6144001**Laboratory ID:** 7C07910-LCV2**Sequence:** 7C07910**Standard ID:** 17C0170

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Perchlorate	1.000	0.8617	-13.8	30.00

HOLDING TIME SUMMARY
SW6850

Laboratory: Empirical Laboratories, LLCSDG: 1703094Client: Microbac Laboratories, Inc.-Ohio Valley DivisionProject: Longhorn

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LH18/24-SP650-6422-Grab	03/08/17 15:00	03/09/17 09:55	03/10/17 13:45	1.95	28.00	03/20/17 18:35	12.15	28.00	

PREPARATION BENCH SHEET

7C10018

Empirical Laboratories, LLC

Printed: 3/22/2017 3:18:36PM

Instrument: LCMS1

Prepared using: GCLC - PERC_6850_W

(No Surrogate)

Matrix: Water

Lab Number	Cont ID	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1703094-01	A	LCMS_PERC_6850_Q5	03/10/2017	10.00	10.00					NA	Diluted 10x due to conductivity KEP 3-10-17
7C10018-BLK1		LCMS_PERC_6850_Q5	03/10/2017	10.00	10.00					NA	
7C10018-BS1		LCMS_PERC_6850_Q5	03/10/2017	10.00	10.00	17A0609		20		NA	

Reagents Used:

Standard	Description
16J0607	Water HPLC GRADE

SEQUENCE TABLE:

```

=====
Line           : 1
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

Eluent ID 16E0510
16E0510

```

=====
Line           : 2
Location      : Vial 1
Sample Information :
Sample Name   : 6E14115-TUN1 16D0464
=====

```

```

=====
Line           : 3
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 4
Location      : Vial 2
Sample Information :
Sample Name   : Reagent Blank
=====

```

```

=====
Line           : 5
Location      : Vial 91
Sample Information :
Sample Name   : 6E14115-CAL1 16D0529
=====

```

```

=====
Line           : 6
Location      : Vial 92
Sample Information :
Sample Name   : 6E14115-CAL2 16D0529
=====

```

```

=====
Line           : 7
Location      : Vial 93
Sample Information :
Sample Name   : 6E14115-CAL3 16D0530
=====

```

```

=====
Line           : 8
Location      : Vial 94
Sample Information :
Sample Name   : 6E14115-CAL4 16D0531
=====

```

Line : 9
Location : Vial 95
Sample Information :
Sample Name : 6E14115-CAL5 1600532

=====
Line : 10
Location : Vial 96
Sample Information :
Sample Name : 6E14115-CAL6 1600533

=====
Line : 11
Location : Vial 97
Sample Information :
Sample Name : 6E14115-CAL7 1600534

=====
Line : 12
Location : Vial 98
Sample Information :
Sample Name : 6E14115-CAL8 1600536

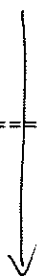
=====
Line : 13
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====
Line : 14
Location : Vial 99
Sample Information :
Sample Name : 6E14115-ICV1 1600537

=====
Line : 15
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV1 NOT USING

=====
Line : 16
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV1

=====
Line : 17
Location : Vial 5
Sample Information :
Sample Name : 6E14115-IFAL



01671

=====
Line : 18
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank NOT USING
=====

=====
Line : 19
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 20
Location : Vial 41
Sample Information :
Sample Name : 1605063-01@100
=====

=====
Line : 21
Location : Vial 42
Sample Information :
Sample Name : 1605063-02@100
=====

=====
Line : 22
Location : Vial 3
Sample Information :
Sample Name : 6E14115-CCV2
=====

=====
Line : 23
Location : Vial 4
Sample Information :
Sample Name : 6E14115-LCV2
=====

=====
Line : 24
Location : Vial 5
Sample Information :
Sample Name : 6E-IFA1
=====

=====
Line : 25
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 26
Location : Vial 2
=====

SR 5-23-14

P1672

Sample Information :
Sample Name : Reagent Blank

=====
Line : 27
Location : Vial 51
Sample Information :
Sample Name : 6E-IFA2600

=====
Line : 28
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 29
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

LCMS-1\6850

008421360

3-20-17

[Handwritten signature]

SEQUENCE TABLE:

```

=====
Line           : 1
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 2
Location      : Vial 1
Sample Information :
Sample Name    : 7C07604-TUN1 17A0677
=====

```

```

=====
Line           : 3
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```

```

=====
Line           : 4
Location      : Vial 3
Sample Information :
Sample Name    : 7C07604-CCV1 17C0169
=====

```

```

=====
Line           : 5
Location      : Vial 3
Sample Information :
Sample Name    : TEST1
=====

```

```

=====
Line           : 6
Location      : Vial 3
Sample Information :
Sample Name    : TEST2
=====

```

```

=====
Line           : 7
Location      : Vial 4
Sample Information :
Sample Name    : 7C07604-LCV1 17A0679
=====

```

```

=====
Line           : 8
Location      : Vial 5
Sample Information :
Sample Name    : 7C07604-IFA1 16F0977
=====

```

```

=====
Line           : 9
Location      : Vial 2
Sample Information :
Sample Name    : Reagent Blank
=====

```


8-20-17

Alvin SM

Line : 9
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====

Line : 10
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank

=====

Line : 11
Location : Vial 6
Sample Information :
Sample Name : 1703035-01@20

=====

Line : 12
Location : Vial 7
Sample Information :
Sample Name : 1702204-01@200

=====

Line : 13
Location : Vial 8
Sample Information :
Sample Name : 1702155-02@5

=====

Line : 14
Location : Vial 9
Sample Information :
Sample Name : 1703001-02@10

=====

Line : 15
Location : Vial 10
Sample Information :
Sample Name : 7C10018-BLK1

=====

Line : 16
Location : Vial 11
Sample Information :
Sample Name : 7C10018-BS1

=====

Line : 17
Location : Vial 12
Sample Information :
Sample Name : 1702102-07 x1

3-20-17

[Handwritten signature]

=====
 Line : 18
 Location : Vial 13
 Sample Information :
 Sample Name : 1703067-02 *IX*
 =====

=====
 Line : 19
 Location : Vial 14
 Sample Information :
 Sample Name : 1703067-03
 =====

=====
 Line : 20
 Location : Vial 15
 Sample Information :
 Sample Name : 1703081-15
 =====

=====
 Line : 21
 Location : Vial 16
 Sample Information :
 Sample Name : 1703081-16
 =====

=====
 Line : 22
 Location : Vial 17
 Sample Information :
 Sample Name : 1703081-17
 =====

=====
 Line : 23
 Location : Vial 3
 Sample Information :
 Sample Name : 7C07604-CCV2 *17C0169*
 =====

=====
 Line : 24
 Location : Vial 4
 Sample Information :
 Sample Name : 7C07604-LCV2 *17A0679*
 =====

=====
 Line : 25
 Location : Vial 18
 Sample Information :
 Sample Name : 1703081-18 *IX*
 =====

=====
 Line : 26
 Location : Vial 19
1703081-19
 =====

3.20.17

[Handwritten signature]

Sample Information :
Sample Name : 1703081-19

1x

=====
Line : 27
Location : Vial 20
Sample Information :
Sample Name : 1703081-25

=====
Line : 28
Location : Vial 21
Sample Information :
Sample Name : 1703081-27

=====
Line : 29
Location : Vial 22
Sample Information :
Sample Name : 1703081-29

=====
Line : 30
Location : Vial 23
Sample Information :
Sample Name : 1703081-31

✓

=====
Line : 31
Location : Vial 24
Sample Information :
Sample Name : 1703094-01@10

=====
Line : 32
Location : Vial 25
Sample Information :
Sample Name : 1703098-02

1x

=====
Line : 33
Location : Vial 26
Sample Information :
Sample Name : 7C10018-MS1

=====
Line : 34
Location : Vial 27
Sample Information :
Sample Name : 7C10018-MSD1

✓

3-20-17

9407 211

Line : 35
Location : Vial 28
Sample Information :
Sample Name : 1703098-22

lx
↓

=====
Line : 36
Location : Vial 29
Sample Information :
Sample Name : 1703098-23

=====
Line : 37
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV3 *17C0169*

=====
Line : 38
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV3 *17A0679*

=====
Line : 39
Location : Vial 30
Sample Information :
Sample Name : 1702102-07@5

=====
Line : 40
Location : Vial 31
Sample Information :
Sample Name : 1703067-02@5

=====
Line : 41
Location : Vial 32
Sample Information :
Sample Name : 1703067-03@5

=====
Line : 42
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV4 *17C0169*

=====
Line : 43
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV4 *17A0679*

Handwritten signature

=====
Line : 44
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 45
Location : Vial 33
Sample Information :
Sample Name : 7C15019-BLK1
=====

=====
Line : 46
Location : Vial 34
Sample Information :
Sample Name : 7C15019-BS1
=====

=====
Line : 47
Location : Vial 35
Sample Information :
Sample Name : 1703085-01 (X)
=====

=====
Line : 48
Location : Vial 36
Sample Information :
Sample Name : 7C15019-MS1
=====

=====
Line : 49
Location : Vial 37
Sample Information :
Sample Name : 7C15019-MSD1
=====

=====
Line : 50
Location : Vial 38
Sample Information :
Sample Name : 1703085-02
=====

=====
Line : 51
Location : Vial 39
Sample Information :
Sample Name : 1703110-01
=====

=====
Line : 52
Location : Vial 40
1703110-02
=====

3-20-17
JH

Sample Information :
Sample Name : 1703110-02 *1x*

=====
Line : 53
Location : Vial 41
Sample Information :
Sample Name : 1703110-03

=====
Line : 54
Location : Vial 42
Sample Information :
Sample Name : 1703110-04

=====
Line : 55
Location : Vial 43
Sample Information :
Sample Name : 1703110-05

=====
Line : 56
Location : Vial 44
Sample Information :
Sample Name : 1703110-06

=====
Line : 57
Location : Vial 45
Sample Information :
Sample Name : 1703110-07

=====
Line : 58
Location : Vial 46
Sample Information :
Sample Name : 1703110-08

=====
Line : 59
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV5 *17C0169*

=====
Line : 60
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV5 *17A0679*

LCMS-1\6850

3-20-17

MA SA

Line : 61
Location : Vial 47
Sample Information :
Sample Name : 1703110-09

K

=====
Line : 62
Location : Vial 48
Sample Information :
Sample Name : 1703110-10

=====
Line : 63
Location : Vial 49
Sample Information :
Sample Name : 1703110-11

↓

=====
Line : 64
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV6 *17C0169*

=====
Line : 65
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV6 *17A0679*

=====
Line : 66
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

=====
Line : 67
Location : Vial 50
Sample Information :
Sample Name : 7C17011-BLK1

=====
Line : 68
Location : Vial 51
Sample Information :
Sample Name : 7C17011-BS1

=====
Line : 69
Location : Vial 52
Sample Information :
Sample Name : 1703092-01

K

LC.MS-1 \ 6850

3-20-17

[Handwritten signature]

=====
 Line : 70
 Location : Vial 53
 Sample Information :
 Sample Name : 7C17011-MS1 IX
 =====

=====
 Line : 71
 Location : Vial 54
 Sample Information :
 Sample Name : 7C17011-MSD1
 =====

=====
 Line : 72
 Location : Vial 55
 Sample Information :
 Sample Name : 1703093-02
 =====

=====
 Line : 73
 Location : Vial 56
 Sample Information :
 Sample Name : 1703093-03
 =====

=====
 Line : 74
 Location : Vial 57
 Sample Information :
 Sample Name : 1703093-04
 =====

=====
 Line : 75
 Location : Vial 58
 Sample Information :
 Sample Name : 1703104-01
 =====

=====
 Line : 76
 Location : Vial 59
 Sample Information :
 Sample Name : 1703104-03
 =====

=====
 Line : 77
 Location : Vial 60
 Sample Information :
 Sample Name : 1703104-05
 =====

=====
 Line : 78
 Location : Vial 61
 1703104-07
 =====

[Handwritten signature]

Sample Information :
Sample Name : 1703104-07

1x

=====
Line : 79
Location : Vial 62
Sample Information :
Sample Name : 1703104-10

=====
Line : 80
Location : Vial 63
Sample Information :
Sample Name : 1703104-11

1x

=====
Line : 81
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV7 17C0169

=====
Line : 82
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV7 17A0679

=====
Line : 83
Location : Vial 64
Sample Information :
Sample Name : 1703104-12

1x

=====
Line : 84
Location : Vial 65
Sample Information :
Sample Name : 1703104-13

=====
Line : 85
Location : Vial 66
Sample Information :
Sample Name : 1703105-01

=====
Line : 86
Location : Vial 67
Sample Information :
Sample Name : 1703106-14

1x

3-20-17

[Handwritten signature]

Line : 87
Location : Vial 68
Sample Information :
Sample Name : 1703107-01

ix

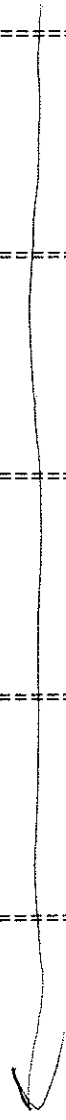
=====
Line : 88
Location : Vial 69
Sample Information :
Sample Name : 1703124-02

=====
Line : 89
Location : Vial 70
Sample Information :
Sample Name : 1703124-03

=====
Line : 90
Location : Vial 71
Sample Information :
Sample Name : 1703124-04

=====
Line : 91
Location : Vial 72
Sample Information :
Sample Name : 1703151-02

=====
Line : 92
Location : Vial 73
Sample Information :
Sample Name : 1703151-03



=====
Line : 93
Location : Vial 3
Sample Information :
Sample Name : 7C07604-CCV8 *17C069*

=====
Line : 94
Location : Vial 4
Sample Information :
Sample Name : 7C07604-LCV8 *17A0679*

=====
Line : 95
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank

SEQUENCE TABLE: *Eluent IDs: 17C0319, 17C0320*

=====
Line : 1
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 2
Location : Vial 1
Sample Information :
Sample Name : 7C07910-TUN1 *17A0677*
=====

=====
Line : 3
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 4
Location : Vial 3
Sample Information :
Sample Name : TEST CCV *17C0169*
=====

=====
Line : 5
Location : Vial 4
Sample Information :
Sample Name : 7C07910-LCV1 *17C0170*
=====

=====
Line : 6
Location : Vial 3
Sample Information :
Sample Name : 7C07910-CCV1 *17C0169*
=====

=====
Line : 7
Location : Vial 5
Sample Information :
Sample Name : 7C07910-IFA1 *16F0477*
=====

=====
Line : 8
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

008421492
3-21-17
[Handwritten signature]

Line : 9
Location : Vial 6
Sample Information :
Sample Name : 1703081-16RE1@5

=====
Line : 10
Location : Vial 7
Sample Information :
Sample Name : 1703081-18@2

=====
Line : 11
Location : Vial 8
Sample Information :
Sample Name : 1703094-01@20

=====
Line : 12
Location : Vial 9
Sample Information :
Sample Name : 1703098-02@2

=====
Line : 13
Location : Vial 10
Sample Information :
Sample Name : 7C10018-MS1@2

=====
Line : 14
Location : Vial 11
Sample Information :
Sample Name : 7C10018-MSD1@2

=====
Line : 15
Location : Vial 12
Sample Information :
Sample Name : 1703092-01@5

=====
Line : 16
Location : Vial 13
Sample Information :
Sample Name : 7C17011-MS1@5

=====
Line : 17
Location : Vial 14
Sample Information :
Sample Name : 7C17011-MSD1@5

Handwritten signature

=====
Line : 18
Location : Vial 15
Sample Information :
Sample Name : 1703093-02@2
=====

=====
Line : 19
Location : Vial 16
Sample Information :
Sample Name : 1703093-03@25
=====

=====
Line : 20
Location : Vial 17
Sample Information :
Sample Name : 1703093-04@5
=====

=====
Line : 21
Location : Vial 18
Sample Information :
Sample Name : 1703104-13@2
=====

=====
Line : 22
Location : Vial 3
Sample Information :
Sample Name : 7C07910-CCV2 17C0169
=====

=====
Line : 23
Location : Vial 4
Sample Information :
Sample Name : 7C07910-LCV2 17C0170
=====

=====
Line : 24
Location : Vial 5
Sample Information :
Sample Name : 7C07910-IFA2 16F0477
=====

=====
Line : 25
Location : Vial 2
Sample Information :
Sample Name : Reagent Blank
=====

=====
Line : 26
Location : Vial 19
7C20015-B1K1
=====

008424574
3-21-17
PWT SM

Sample Information :
Sample Name : 7C20015-BLK1

=====
Line : 27
Location : Vial 20
Sample Information :
Sample Name : 7C20015-BS1
=====

=====
Line : 28
Location : Vial 21
Sample Information :
Sample Name : 1703124-10
=====

=====
Line : 29
Location : Vial 22
Sample Information :
Sample Name : 1703124-11
=====

=====
Line : 30
Location : Vial 23
Sample Information :
Sample Name : 1703124-12
=====

=====
Line : 31
Location : Vial 24
Sample Information :
Sample Name : 1703124-13
=====

=====
Line : 32
Location : Vial 25
Sample Information :
Sample Name : 1703124-14
=====

=====
Line : 33
Location : Vial 26
Sample Information :
Sample Name : 1703124-15
=====

=====
Line : 34
Location : Vial 27
Sample Information :
Sample Name : 1703133-06
=====



[Handwritten signature]

Line : 35
Location : Vial 28
Sample Information :
Sample Name : 7C20015-MS1 (x)

Line : 36
Location : Vial 29
Sample Information :
Sample Name : 7C20015-MSD1

Line : 37
Location : Vial 30
Sample Information :
Sample Name : 1703133-07

Line : 38
Location : Vial 31
Sample Information :
Sample Name : 1703133-08

Line : 39
Location : Vial 32
Sample Information :
Sample Name : 1703133-09

Line : 40
Location : Vial 3
Sample Information :
Sample Name : 7C07910-CCV3 17C0169

Line : 41
Location : Vial 4
Sample Information :
Sample Name : 7C07910-LCV3 17C0170

Line : 42
Location : Vial 33
Sample Information :
Sample Name : 1703133-10 (x)

Line : 43
Location : Vial 3
Sample Information :
Sample Name : 7C07910-CCV4 17C0169

164 911

=====
Line : 44
Location : Vial 4
Sample Information :
Sample Name : 7C07910-LCV4 17C0170
=====

=====
Line : 45
Location : Vial 81
Sample Information :
Sample Name : Reagent Blank
=====

Perchlorate Analysis Evaluation

5/21/2016

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
Perchlorate 0.2 ug/L	65435.8	27872.8	2.3	2085020		9.707	9.729	0.998
Perchlorate 0.5 ug/L	162300	60086.9	2.7	2067670		9.733	9.741	0.999
Perchlorate 1.0 ug/L	327868	115234	2.8	2093390		9.679	9.699	0.998
Perchlorate 2.0 ug/L	670491	225125	3.0	2045940		9.729	9.751	0.998
Perchlorate 5.0 ug/L	1755730	562562	3.1	2072140		9.719	9.74	0.998
Perchlorate 10 ug/L	3646000	1146590	3.2	2063840		9.702	9.722	0.998
Perchlorate 20 ug/L	7550470	2386510	3.2	2032520		9.735	9.746	0.999
Perchlorate 50 ug/L	19125900	6116300	3.1	1918010		9.705	9.717	0.999
Perchlorate 5.0 ug/L ICV	1665970	536774	3.1	2022850	98.80	9.719	9.744	0.997
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
			#DIV/0!		0.00			#DIV/0!
Average IS area of curve:	2047316							

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria \pm 50% of Avg IS of curve

CAL Date 04/25/16

Perchlorate Analysis Evaluation

3/17/2017 Seq. ID #7C07604

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1702102-07	5822850			2197900	107.355	8.557	8.584	0.997
1702155-02	615108	241381	2.548	2051760	100.217	8.323	8.365	0.995
1702204-01	4202050	1312020	3.203	1837990	89.776	7.974	8.011	0.995
1703001-02	0	0		1479070	72.244	7.2	7.276	0.99
1703035-01	26473.7	0		934570	45.649	6.497	6.528	0.995
1703067-02	96674.8	41489.9	2.33	2227460	108.799	8.507	8.542	0.996
1703067-03	0	0		2153860	105.204	8.5	8.497	1
1703081-15	2629790	832064	3.161	1980300	96.727	7.641	7.666	0.997
1703081-17	3713170	1155780	3.213	1884730	92.059	7.661	7.697	0.995
1703081-19	0	0		2145910	104.816	8.9	8.688	1.024
1703081-25	248277	85009.4	2.921	1593230	77.82	7.78	7.811	0.996
1703081-27	281466	99086.2	2.841	1863470	91.02	7.705	7.737	0.996
1703081-29	0	0		2072220	101.216	8.6	8.625	0.997
1703081-31	0	0		2023760	98.849	8.6	8.655	0.994
1703085-01	0	0		1488120	72.686	7	7.045	0.994
1703085-02	0	0		1257670	61.43	7	7.097	0.986
1703098-22	3585300	1111760	3.225	1742480	85.11	8.151	8.183	0.996
1703098-23	519268	143805	3.611	1653390	80.759	7.612	7.673	0.992
1703104-01	22722.1	0		1782360	87.058	7.814	7.853	0.995
1703104-03	20353.6	0		1206620	58.937	7.95	8.037	0.989
1703104-05	0	0		2043080	99.793	8.6	8.616	0.998
1703104-07	0	0		2121410	103.619	8.6	8.617	0.998
1703104-10	0	0		2161430	105.574	8.6	8.63	0.997
1703104-11	0	0		2085470	101.864	8.6	8.664	0.993
1703104-12	3746450	1116320	3.356	1377740	67.295	7.325	7.361	0.995
1703105-01	0	0		2018050	98.571	8.6	8.642	0.995
1703106-14	403665	141479	2.853	2064130	100.821	8.425	8.453	0.997
1703107-01	0	0		2076610	101.431	8.6	8.649	0.994
1703110-01	0	0		1886510	92.146	8.6	8.563	1.004
1703110-02	0	0		1958980	95.685	8.6	8.631	0.996
1703110-03	0	0		2086690	101.923	8.6	8.61	0.999
1703110-04	0	0		2149180	104.975	8.6	8.656	0.994
1703110-05	0	0		2002610	97.816	8.6	8.429	1.02
1703110-06	0	0		2116030	103.356	8.6	8.454	1.017
1703110-07	0	0		2119260	103.514	8.6	8.46	1.017
1703110-08	0	0		2152140	105.12	8.6	8.483	1.014
1703110-09	0	0		2156530	105.334	8.5	8.473	1.003
1703110-10	0	0		2283540	111.538	8.5	8.603	0.988
1703110-11	0	0		1949120	95.204	8.5	8.557	0.993
1703124-02	2881410	897728	3.21	1815600	88.682	7.672	7.702	0.996
1703124-03	3473530	1078050	3.222	1787650	87.317	7.902	7.933	0.996
1703124-04	3389490	1031110	3.287	1644890	80.344	7.685	7.713	0.996

NCR

ND

1703151-02	0	0		2538500	123.992	8.4	8.416	0.998
1703151-03	0	0		2137860	104.423	8.4	8.495	0.989
7C07604-CCV1	1793200	572622	3.132	2260790	110.427	8.59	8.62	0.997
7C07604-CCV2	1652820	534506	3.092	2075100	101.357	8.366	8.397	0.996
7C07604-CCV3	1730430	565635	3.059	2165140	105.755	8.596	8.622	0.997
7C07604-CCV4	1741180	562814	3.094	2203400	107.624	8.548	8.576	0.997
7C07604-CCV5	1726150	554279	3.114	2158150	105.414	8.468	8.493	0.997
7C07604-CCV6	1743150	555345	3.139	2180790	106.519	8.449	8.477	0.997
7C07604-CCV7	1744820	561212	3.109	2208770	107.886	8.472	8.503	0.996
7C07604-CCV8	1720080	557709	3.084	2162720	105.637	8.425	8.458	0.996
7C07604-IFA1	486210	162357	2.995	1528080	74.638	7.161	7.224	0.991
7C07604-LCV1	367007	117047	3.136	2166580	105.825	8.39	8.44	0.994
7C07604-LCV2	343368	99746.3	3.442	2044810	99.878	8.194	8.237	0.995
7C07604-LCV3	348694	114570	3.044	2091820	102.174	8.234	8.263	0.996
7C07604-LCV4	349912	107320	3.26	2070130	101.114	8.203	8.24	0.996
7C07604-LCV5	337744	105340	3.206	1994520	97.421	8.09	8.124	0.996
7C07604-LCV6	345090	104759	3.294	2041460	99.714	8.113	8.15	0.995
7C07604-LCV7	354065	99606.4	3.555	2080030	101.598	8.135	8.163	0.997
7C07604-LCV8	340781	104778	3.252	2021680	98.748	8.066	8.102	0.996
7C10018-BLK1	0	0		1981720	96.796	8.7	8.747	0.995
7C10018-BS1	480063	161622	2.97	1560300	76.212	8.786	8.816	0.997
7C15019-BLK1	0	0		1357780	66.32	8.8	8.826	0.997
7C15019-BS1	746102	251452	2.967	2189240	106.932	8.665	8.693	0.997
7C15019-MS1	463192	154642	2.995	1358420	66.351	6.928	6.961	0.995
7C15019-MSD1	421310	139587	3.018	1290860	63.051	6.868	6.904	0.995
7C17011-BLK1	0	0		2171580	106.07	8.6	8.644	0.995
7C17011-BS1	683514	228572	2.99	2182490	106.602	8.662	8.69	0.997

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

Perchlorate Analysis Evaluation

3/20/2017 Seq. ID #7C07910

Sample	Perc83 Area	Perc85 Area	83/85 Ratio	IS Area	IS Recovery	RT Perc83	RT Perc89	RRT
6E14115-CAL1	65435.8	27872.8	2.348	2085020		9.707	9.729	0.998
6E14115-CAL2	162300	60086.9	2.701	2067670		9.718	9.741	0.998
6E14115-CAL3	327868	115234	2.845	2093390		9.679	9.699	0.998
6E14115-CAL4	670491	225125	2.978	2045940		9.729	9.751	0.998
6E14115-CAL5	1755730	562562	3.121	2072140		9.719	9.74	0.998
6E14115-CAL6	3646000	1146590	3.18	2063840		9.702	9.722	0.998
6E14115-CAL7	7550470	2386510	3.164	2032520		9.725	9.746	0.998
6E14115-CAL8	19125900	6116300	3.127	1918010		9.705	9.717	0.999
6E14115-ICV1	1665970	536774	3.104	2022850	98.805	9.719	9.744	0.997
1703081-16RE1	707769	220994	3.203	1872190	91.446	8.331	8.363	0.996
1703081-18	0	0		2039860	99.636	8.5	8.52	0.998
1703092-01	16500.6	0		2050710	100.166	8.522	8.569	0.995
1703093-02	0	0		1698980	82.986	8.6	8.614	0.998
1703093-04	664093	231434	2.869	1913340	93.456	8.45	8.476	0.997
1703094-01	0	0		858113	41.914	6.4	6.462	0.99
1703098-02	334980	104332	3.211	1215050	59.348	7.286	7.321	0.995
1703104-13	2011450	658968	3.052	1441590	70.414	7.566	7.595	0.996
1703124-10	1913500	605735	3.159	1785760	87.224	7.749	7.781	0.996
1703124-11	368012	126292	2.914	1696420	82.861	7.719	7.749	0.996
1703124-14	0	0		1999080	97.644	8.6	8.657	0.993
1703133-07	4136010	1269920	3.257	1747510	85.356	7.995	8.024	0.996
1703133-08	4105580	1277140	3.215	1736090	84.798	7.992	8.02	0.997
1703133-09	0	0		1980270	96.725	8.7	8.705	0.999
1703133-10	0	0		2004890	97.928	8.5	8.682	0.979
7C07910-CCV1	1649620	535390	3.081	2098720	102.511	8.377	8.627	0.971
7C07910-CCV2	1640160	533331	3.075	2083380	101.762	8.472	8.504	0.996
7C07910-CCV3	1664000	532208	3.127	2127450	103.914	8.518	8.547	0.997
7C07910-CCV4	1698140	536587	3.165	2154120	105.217	8.541	8.568	0.997
7C07910-IFA1	472692	176416	2.679	1459760	71.301	7.358	7.393	0.995
7C07910-IFA2	520204	198142	2.625	1596490	77.98	7.413	7.45	0.995
7C07910-LCV1	307232	105033	2.925	2093080	102.235	8.573	8.601	0.997
7C07910-LCV2	312019	106596	2.927	2121230	103.61	8.546	8.572	0.997
7C07910-LCV3	309350	102045	3.032	2155660	105.292	8.568	8.597	0.997
7C07910-LCV4	314577	109005	2.886	2146410	104.84	8.591	8.62	0.997
7C10018-MS1	549732	175289	3.136	1204030	58.81	7.337	7.369	0.996
7C10018-MSD1	573363	183679	3.121	1250950	61.102	7.379	7.406	0.996
7C17011-MS1	144987	53162.6	2.727	1940980	94.806	8.499	8.52	0.998
7C17011-MSD1	148374	60399.3	2.457	1938450	94.682	8.415	8.442	0.997
7C20015-BLK1	0	0		2029770	99.143	8.6	8.681	0.991
7C20015-BS1	642913	221363	2.904	2011610	98.256	8.659	8.685	0.997

SEE NCR

ND

ND

Average IS area of curve: 2047316.25

83/85 Ratio Criteria 2.3-3.8

RRT Criteria 0.98-1.02

IS Recovery Criteria + 50% of Avg IS of curve

Laboratory Report Number: L17021201 (Revised)

Report revised for Barium 6020.

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on March 09 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Lab Report #: L17021201

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
Sample ID: LH18/24-SP650-6418-Grab (2/22 @ 10:00). No container for 6850 received. Can split with the CR-6 container. BRG	Will confirm with client. 6850 analyzed at Empirical Laboratories. ALS
Sample ID: LH18/24-SP650-6418-Grab (2/22 @ 10:00). CR-6 was received in hold at lab (9:39) but was logged out of hold. BRG	Client notified, please proceed with analysis. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00113730	I	4.0		1Z4016632210154876	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	No
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

**Lab Report #:** L17021201**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6418-GRAB	L17021201-01	02/22/2017 10:00	02/23/2017 09:39
LH18/24-SP650-6418-GRAB	L17021201-02	02/22/2017 00:01	02/23/2017 09:39

Microbac REPORT L17021201
PREPARED FOR AECOM Technical Services, Inc.
WORK ID:

1.0 Summary Data	5
1.1 Narratives	6
1.2 Certificate of Analysis	37
2.0 Full Sample Data Package	46
2.1 Volatiles Data	47
2.1.1 Volatiles GCMS Data (8260)	48
2.1.1.1 Summary Data	49
2.1.1.2 QC Summary Data	54
2.1.1.3 Sample Data	79
2.1.1.4 Standards Data	90
2.1.1.5 Raw QC Data	174
2.2 Semivolatiles Data	186
2.2.1 Semivolatiles GC/MS Data (Dioxane)	187
2.2.1.1 Summary Data	188
2.2.1.2 QC Summary Data	191
2.2.1.3 Sample Data	219
2.2.1.4 Standards Data	226
2.2.1.5 Raw QC Data	251
2.3 Metals Data	269
2.3.1 Metals I C P Data	270
2.3.1.1 Summary Data	271
2.3.1.2 QC Summary Data	274
2.3.1.3 Raw Data	337
2.3.2 Metals ICP-MS Data	826
2.3.2.1 Summary Data	827
2.3.2.2 QC Summary Data	830
2.3.2.3 Raw Data	863
2.4 General Chemistry Data	1252
2.4.1 Hexavalent Chromium Data	1253
2.4.1.1 Summary Data	1254
2.4.1.2 QC Summary Data	1257
2.4.1.3 Raw Data	1264
3.0 Attachments	1272

1.0 Summary Data

1.1 Narratives



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Sarah Vandenberg	<i>Sarah Vandenberg</i>		2017-03-07 20:09:47



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	8260
Prep Batch Number(s):	605281	Reviewer Name:	Sarah Vandenberg
LRC Date:	2017-03-07 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-03-03 19:17:58



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG604087	Reviewer Name:	Eric Lawson
LRC Date:	2017-03-03 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kerri Buck	<i>K: K Buck</i>		2017-03-06 15:53:09



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?		X			ER#1
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6010
Prep Batch Number(s):	604065	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

ER#1 - The low level initial calibration verification analyzed on 27-Feb-2017 at 15:16 yielded a noncompliant recovery for selenium. Client sample 01 along with the batch QA/QC samples was reanalyzed on a later calibration which was compliant for selenium. The low level continuing calibration verification analyzed on 28-Feb-2017 at 22:05 yielded a noncompliant high recovery for selenium. However, since all client samples yielded results that were below the reporting detection limit, no further action was required with permission of the project manager.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kerri Buck			2017-03-06 15:50:46



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	6020
Prep Batch Number(s):	604063	Reviewer Name:	Kerri Buck
LRC Date:	2017-03-06 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-02-28 14:40:56



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?		X			
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17021201
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG603982	Reviewer Name:	Deanna Hesson
LRC Date:	2017-02-28 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

The sample was recieved very near the hold time of 24 hours. The sample was analyzed out of hold.

1.2 Certificate of Analysis

Lab Report #: L17021201

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 03/03/2017 14:14
Workgroup #: WG605281	Analyst: TMB	Run Date: 03/07/2017 13:35
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: 8M418196
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	13.4		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	3.70		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	97.0	70	120			
4-Bromofluorobenzene	95.4	75	120			
Dibromofluoromethane	93.5	85	115			
Toluene-d8	94.6	85	120			
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17021201
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3520C	Prep Date: 02/24/2017 16:11
Matrix: Water	Analytical Method: 8270D	Cal Date: 01/25/2017 13:43
Workgroup #: WG604416	Analyst: SCB/LJH	Run Date: 03/01/2017 20:19
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: 15M20613
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	21.6	J	2.38	1.19	0.595
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	73.0	20	129			
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17021201
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3520C	Prep Date: 02/24/2017 16:11
Matrix: Water	Analytical Method: 8270D	Cal Date: 01/25/2017 13:43
Workgroup #: WG604416	Analyst: SCB/LJH	Run Date: 03/02/2017 16:49
Collect Date: 02/22/2017 10:00	Dilution: 5	File ID: 15M20634
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	20.2		11.9	5.96	2.98
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	66.4	20	129			

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3015	Prep Date: 02/24/2017 09:13
Matrix: Water	Analytical Method: 6010C	Cal Date: 02/28/2017 15:34
Workgroup #: WG604140	Analyst: KKB	Run Date: 02/28/2017 18:39
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: T4.022817.183922
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0800	U	0.0800	0.0800	0.0400
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17021201
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3015	Prep Date: 02/24/2017 08:46
Matrix: Water	Analytical Method: 6020A	Cal Date: 02/28/2017 10:52
Workgroup #: WG604209	Analyst: JYH	Run Date: 02/28/2017 11:32
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: NI.022817.113234
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Barium, Total	7440-39-3	0.241		0.00600	0.00300	0.00150
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.
---	--

Lab Report #: L17021201
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 12/08/2016 08:20
Workgroup #: WG603982	Analyst: ADG	Run Date: 02/23/2017 11:15
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: 00.1702231115-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U,H1	0.0200	0.0100	0.00500
U,H1	Not detected; Sample analysis performed past holding time.					

Certificate of Analysis

Sample #: L17021201-02	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 03/03/2017 14:14
Workgroup #: WG605281	Analyst: TMB	Run Date: 03/07/2017 13:05
Collect Date: 02/22/2017 00:01	Dilution: 1	File ID: 8M418195
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	94.5	70	120	
4-Bromofluorobenzene	95.9	75	120	
Dibromofluoromethane	91.9	85	115	
Toluene-d8	94.7	85	120	

U Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

2.0 Full Sample Data Package

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 03/03/2017 14:14
Workgroup #: WG605281	Analyst: TMB	Run Date: 03/07/2017 13:35
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: 8M418196
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	13.4		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	3.70		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	97.0	70	120	
4-Bromofluorobenzene	95.4	75	120	
Dibromofluoromethane	93.5	85	115	
Toluene-d8	94.6	85	120	

U Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L17021201-02	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 03/03/2017 14:14
Workgroup #: WG605281	Analyst: TMB	Run Date: 03/07/2017 13:05
Collect Date: 02/22/2017 00:01	Dilution: 1	File ID: 8M418195
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	94.5	70	120			
4-Bromofluorobenzene	95.9	75	120			
Dibromofluoromethane	91.9	85	115			
Toluene-d8	94.7	85	120			
U	Analyte was not detected. The concentration is below the reported LOD.					

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100
RF = Calculated Response Factor	1.0039

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

$$Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Vs = Purge volume of sample (mL)	10
Vn = Nominal purge volume of sample (mL) (10.0 mL)	10
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

$$Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Ws = Weight of sample purged (g)	5
Wn = Nominal purge weight (g) (5.0 g)	5
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	254.4856

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

$$y = 86550/593147 = 0.1459$$

Step 3: Solve for x

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213] = 0.7152$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.7152) = 17.88$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.213
Intercept from curve, b:	-0.00642
Area of analyte, Ax:	86550
Area of Internal Standard, Ais:	593147
Concentration of IS, Cis	25.00
Response Ratio:	0.145917
Amount Ratio:	0.715195
Concentration:	17.87988
Units of Internal Standard:	ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	-0.00629
Value of B from plot:	0.511
Value of C from plot:	-0.0276
Area of unknown from quantitation report:	293821
Area of IS from quantitation report:	784848
Response ratio, y:	0.374367
C - y:	-0.40197
Root 1 - Computed amount ratio, X1:	80.44567
Root 2 - Computed amount ratio, X2:	0.794396 use this solution
Concentration of IS, Cis:	25.00
Concentration of analyte, Cx:	19.86 ug/L

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 120816
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 53988

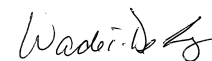
Internal Standard: STD78987 Surrogate Standard: STD78987
 CCV: STD79185; STD79330 LCS: STD79186; STD78319 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG594051; WG594142

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M416518	WG594051-01 50ng BFB STD A9/FOO	NA	1	1	STD78995	12/08/16 08:55
8M416519	WG594051-02 5ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 09:19
8M416520	WG594051-03 20ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 09:48
8M416521	WG594051-04 50ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 10:17
8M416522	WG594051-05 100ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 10:47
8M416523	WG594051-06 200ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 11:16
8M416524	WG594051-07 300ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 11:46
8M416525	WG594051-08 400ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 12:16
8M416526	WG594051-09 500ug/L STD A9/FOO	NA	1	1	STD79185	12/08/16 12:45
8M416527	RINSE	NA	1	1		12/08/16 13:14
8M416528	RINSE	NA	1	1		12/08/16 13:43
8M416529	WG594051-10 100ug/L STD A9/FOO	NA	1	1	STD79186	12/08/16 14:12
8M416530	WG594141-01 50ng BFB STD 8260	NA	1	1	STD78995	12/08/16 14:40
8M416531	WG594141-01 50ng BFB STD 8260	NA	1	1	STD78995	12/08/16 14:54
8M416532	WG594141-01 50ng BFB STD 8260	NA	1	1	STD78995	12/08/16 15:17
8M416533	WG594141-02 50ug/L CCV STD 8260	NA	1	1	STD79330	12/08/16 15:44
8M416534	WG594141-02 50ug/L CCV STD 8260	NA	1	1	STD79330	12/08/16 16:15
8M416535	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD78971	12/08/16 16:45
8M416536	WG594142-01 VBLK1208 BLANK STD 826	NA	1	1		12/08/16 17:16
8M416537	WG594142-02 20ug/L LCS STD 8260	NA	1	1	STD79319	12/08/16 17:45
8M416538	L16120424-04 A MS 826-SPE	<2	1	1	STD79319	12/08/16 18:14
8M416539	L16120424-05 A MSD 826-SPE	<2	1	1	STD79319	12/08/16 18:43
8M416540	L16120315-05 B TB 826-SPE	<2	1	1		12/08/16 19:12
8M416541	L16120315-03 B EB 826-SPE	<2	1	1		12/08/16 19:41
8M416542	L16120424-01 A TB 826-SPE	<2	1	1		12/08/16 20:10
8M416543	L16120424-03 A RS 826-SPE	<2	1	1		12/08/16 20:39
8M416544	L16120424-06 A 826-SPE	<2	1	1		12/08/16 21:09
8M416545	L16120424-02 A 826-SPE	<2	1	1		12/08/16 21:40
8M416546	L16120315-01 B 826-SPE	<2	1	1		12/08/16 22:08
8M416547	L16120315-02 B 826-SPE	<2	1	1		12/08/16 22:37
8M416548	L16120315-04 B 826-SPE	<2	1	1		12/08/16 23:06
8M416549	L16120424-07 A 826-SPE	<2	1	1		12/08/16 23:35
8M416550	WG594142-06 20ug/L LCS2 STD 8260	NA	1	1	STD79319	12/09/16 00:04
8M416551	CCV	NA	1	1		12/09/16 00:33

Approved: December 09, 2016

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 120816
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 53988

Internal Standard: STD78987 Surrogate Standard: STD78987
 CCV: STD79185; STD79330 LCS: STD79186; STD78319 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG594051; WG594142

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M416552	RINSE	NA	1	1		12/09/16 01:01

Comments

Seq.	Rerun	Dil.	Reason	Analytes
13	X			
File ID: 8M416530				
Tune failed, DNR.				
15	X			
File ID: 8M416531				
Tune failed, DNR.				
16				
File ID: 8M416532				
Purged BFB.				
17	X			
File ID: 8M416533				
DNR. Bromomethane was low.				
19				
File ID: 8M416535				
Not needed, DNR.				
27	X	10	Over Calibration Range	PCE
File ID: 8M416543				

Approved: December 09, 2016

Page: 2

Wade D. [Signature]



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 030317
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: _____

Internal Standard: STD80702 Surrogate Standard: STD80702
 CCV: STD80732 LCS: STD80765 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG604846

Comments:

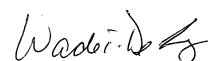
File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M418132	WG604846-01 50ng BFB STD 8260	NA	1	1	STD80536	03/03/17 08:58
8M418133	WG604846-02 0.3ug/L STD 8260	NA	1	1	STD80732	03/03/17 09:22
8M418134	WG604846-03 0.4ug/L STD 8260	NA	1	1	STD80732	03/03/17 09:51
8M418135	WG604846-04 1ug/L STD 8260	NA	1	1	STD80732	03/03/17 10:20
8M418136	WG604846-05 2ug/L STD 8260	NA	1	1	STD80732	03/03/17 10:49
8M418137	WG604846-06 5ug/L STD 8260	NA	1	1	STD80732	03/03/17 11:18
8M418138	WG604846-02 0.3ug/L STD 8260	NA	1	1	STD80732	03/03/17 11:48
8M418139	WG604846-07 20ug/L STD 8260	NA	1	1	STD80732	03/03/17 12:17
8M418140	WG604846-08 50ug/L STD 8260	NA	1	1	STD80732	03/03/17 12:46
8M418141	WG604846-09 100ug/L STD 8260	NA	1	1	STD80732	03/03/17 13:15
8M418142	WG604846-10 200ug/L STD 8260	NA	1	1	STD80732	03/03/17 13:45
8M418143	WG604846-11 300ug/L STD 8260	NA	1	1	STD80732	03/03/17 14:14
8M418144	RINSE	NA	1	1		03/03/17 14:43
8M418145	RINSE	NA	1	1		03/03/17 15:12
8M418146	WG604846-12 50ug/L ALT SRC STD 8260	NA	1	1	STD80757	03/03/17 16:06
8M418147	RINSE	NA	1	1		03/03/17 16:34
8M418148	WG604846-12 50ug/L ALT SRC STD	NA	1	1	STD80765	03/03/17 17:04
8M418149	RINSE	NA	1	1		03/03/17 17:33

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 8M418133				
DNR.				
15	X			
File ID: 8M418146				
DNR.				

Approved: March 07, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 030717
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18

Maintenance Log ID: _____

Internal Standard: STD80702 Surrogate Standard: STD80702
 CCV: STD80765 LCS: STD80757 MS/MSD: STD80757

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: _____

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M418188	WG605280-01 50ng BFB STD 8260	NA	1	1	STD80536	03/07/17 09:59
8M418189	WG605280-01 50ng BFB STD 8260	NA	1	1	STD80536	03/07/17 10:13
8M418190	WG605280-02 50ug/L CCV STD 8260	NA	1	1	STD80765	03/07/17 10:37
8M418191	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD80642	03/07/17 11:07
8M418192	WG605281-01 VBLK0307 BLANK STD 826	NA	1	1		03/07/17 11:36
8M418193	WG605281-02 20ug/L LCS STD 8260	NA	1	1	STD80757	03/07/17 12:05
8M418194	WG605281-03 20ug/L LCS2 STD 8260	NA	1	1	STD80757	03/07/17 12:35
8M418195	L17021201-02 B TB 826-SPE	<2	1	1		03/07/17 13:05
8M418196	L17021201-01 B 826-SPE	3	1	1		03/07/17 13:35

Comments

Seq.	Rerun	Dil.	Reason	Analytes
1	X			
File ID: 8M418188				
Tune failed. DNR.				
4				
File ID: 8M418191				
Not needed, DNR.				

Approved: March 07, 2017

Page: 1




Microbac Laboratories Inc.

Data Checklist

Date: 08-DEC-2016
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 79117
 Analytical Workgroups: WG594051; WG594142

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	WTD
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
08-DEC-2016

Tiffany Bailey

Secondary Reviewer:
09-DEC-2016

Wade D. ...



Microbac Laboratories Inc.

Data Checklist

Date: 03-MAR-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 80788
 Analytical Workgroups: WG604846

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	WTD
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
06-MAR-2017

Tiffany Bailey

Secondary Reviewer:
07-MAR-2017

Wade D. ...



Microbac Laboratories Inc.

Data Checklist

Date: 07-MAR-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 80827
 Analytical Workgroups: WG605281

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
07-MAR-2017

Tiffany Bailey

Secondary Reviewer:
07-MAR-2017

Sarah Vandenberg



Analytical Method:8260B
Login Number:L17021201

AAB#:WG605281

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6418-GRAB	01	02/22/17					03/07/2017	13.1	14		03/07/17	13.1	14	
LH18/24-SP650-6418-GRAB	02	02/22/17					03/07/2017	13.5	14		03/07/17	13.5	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5186900
Report generated 03/07/2017 15:05



Login Number: L17021201
 Instrument Id: HPMS8
 Workgroup (AAB#): WG605281

Method: 8260
 CAL ID: HPMS8-03-MAR-17
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L17021201-01	1.00	01	97.0	93.5	95.4	94.6
L17021201-02	1.00	01	94.5	91.9	95.9	94.7
WG605281-01	1.00	01	93.7	91.7	96.3	94.9
WG605281-02	1.00	01	94.1	92.9	94.0	93.4
WG605281-03	1.00	01	95.1	93.6	92.9	94.0

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17021201
 Blank File ID: 8M418192
 Prep Date: 03/07/17 11:36
 Analyzed Date: 03/07/17 11:36
 Analyst: TMB

Work Group: WG605281
 Blank Sample ID: WG605281-01
 Instrument ID: HPMS8
 Method: 8260B

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG605281-02	8M418193	03/07/17 12:05	01
LCS2	WG605281-03	8M418194	03/07/17 12:35	01
LH18/24-SP650-6418-GRAB	L17021201-02	8M418195	03/07/17 13:05	01
LH18/24-SP650-6418-GRAB	L17021201-01	8M418196	03/07/17 13:35	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5187101
 Report generated 03/07/2017 15:05



Login Number: L17021201 Prep Date: 03/07/17 11:36 Sample ID: WG605281-01
 Instrument ID: HPMS8 Run Date: 03/07/17 11:36 Prep Method: 5030B/5030C/503
 File ID: 8M418192 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG605281 Matrix: Water Units: ug/L
 Contract #: Cal ID: HPMS8-03-MAR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	0.500	0.125	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	0.500	0.125	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chloroform	0.125	0.500	0.125	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
Methylene chloride	0.250	1.00	0.250	1	U
Styrene	0.125	0.500	0.125	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U
Xylenes	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	93.7	70 - 120	PASS
4-Bromofluorobenzene	96.3	75 - 120	PASS
Dibromofluoromethane	91.7	85 - 115	PASS
Toluene-d8	94.9	85 - 120	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5186901
 07-MAR-2017 15:05



Login Number: L17021201 Analyst: TMB Prep Method: 5030B/5030C/503
 Instrument ID: HPMS8 Matrix: Water Method: 8260B
 Workgroup (AAB#): WG605281 Units: ug/L
 QC Key: DOD4 Lot #: STD80757

Sample ID: WG605281-02 LCS File ID: 8M418193 Run Date: 03/07/2017 12:05
 Sample ID: WG605281-03 LCS2 File ID: 8M418194 Run Date: 03/07/2017 12:35

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	19.6	98.2	20.0	21.1	105	7.14	65 - 130	30	
1,1,2-Trichloroethane	20.0	19.6	98.1	20.0	19.7	98.4	0.244	75 - 125	30	
1,1-Dichloroethane	20.0	19.1	95.7	20.0	20.2	101	5.60	70 - 135	30	
1,1-Dichloroethene	20.0	18.4	91.9	20.0	19.5	97.7	6.06	70 - 130	30	
1,2-Dichloroethane	20.0	19.9	99.6	20.0	20.3	102	2.15	70 - 130	30	
Acetone	20.0	19.2	96.0	20.0	19.8	98.8	2.91	40 - 140	30	
Benzene	20.0	19.7	98.7	20.0	20.5	102	3.59	80 - 120	30	
Carbon tetrachloride	20.0	19.5	97.5	20.0	20.5	103	5.01	65 - 140	30	
Chloroform	20.0	18.8	94.2	20.0	19.6	98.1	4.01	65 - 135	30	
Ethylbenzene	20.0	17.9	89.5	20.0	18.8	93.9	4.81	75 - 125	30	
Methylene chloride	20.0	18.7	93.5	20.0	19.5	97.6	4.31	55 - 140	30	
Styrene	20.0	20.0	100	20.0	20.8	104	3.72	65 - 135	30	
Tetrachloroethene	20.0	18.9	94.3	20.0	19.6	97.8	3.64	45 - 150	30	
Toluene	20.0	19.4	97.2	20.0	20.3	102	4.38	75 - 120	30	
Trichloroethene	20.0	18.8	94.1	20.0	19.9	99.7	5.79	70 - 125	30	
Vinyl chloride	20.0	22.0	110	20.0	22.9	115	4.31	50 - 145	30	
Xylenes	60.0	56.6	94.3	60.0	59.0	98.3	4.20	80 - 120	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,2-Dichloroethane-d4	94.1	95.1	70 - 120	PASS
Dibromofluoromethane	92.9	93.6	85 - 115	PASS
4-Bromofluorobenzene	94.0	92.9	75 - 120	PASS
Toluene-d8	93.4	94.0	85 - 120	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT



BFB

Login Number: L17021201 Tune ID: WG594051-01
 Instrument: HPMS8 Run Date: 12/08/2016
 Analyst: TMB Run Time: 08:55
 Workgroup: WG594051 File ID: 8M416518
 Cal ID: HPMS8-08-DEC-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	15.9	3959	PASS
75.0	95.0	30.0	60.0	50.2	12523	PASS
95.0	95.0	100	100	100	24967	PASS
96.0	95.0	5.00	9.00	6.61	1651	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	74.9	18700	PASS
175	174	5.00	9.00	7.25	1355	PASS
176	174	95.0	101	96.0	17959	PASS
177	176	5.00	9.00	6.08	1092	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594051-02	STD	01	12/08/2016 09:19	
WG594051-03	STD	01	12/08/2016 09:48	
WG594051-04	STD	01	12/08/2016 10:17	
WG594051-05	STD-CCV	01	12/08/2016 10:47	
WG594051-06	STD	01	12/08/2016 11:16	
WG594051-07	STD	01	12/08/2016 11:46	
WG594051-08	STD	01	12/08/2016 12:16	
WG594051-09	STD	01	12/08/2016 12:45	
WG594051-10	SSCV	01	12/08/2016 14:12	

* Sample past 12 hour tune limit



BFB

Login Number: L17021201 Tune ID: WG604846-01
 Instrument: HPMS8 Run Date: 03/03/2017
 Analyst: TMB Run Time: 08:58
 Workgroup: WG604846 File ID: 8M418132
 Cal ID: HPMS8-03-MAR-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	17.7	6821	PASS
75.0	95.0	30.0	60.0	46.5	17889	PASS
95.0	95.0	100	100	100	38477	PASS
96.0	95.0	5.00	9.00	7.09	2727	PASS
173	174	0	2.00	0.383	114	PASS
174	95.0	50.0	100	77.4	29800	PASS
175	174	5.00	9.00	7.40	2204	PASS
176	174	95.0	101	99.5	29642	PASS
177	176	5.00	9.00	6.68	1979	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG604846-03	STD	01	03/03/2017 09:51	
WG604846-04	STD	01	03/03/2017 10:20	
WG604846-05	STD	01	03/03/2017 10:49	
WG604846-06	STD	01	03/03/2017 11:18	
WG604846-02	STD	01	03/03/2017 11:48	
WG604846-07	STD	01	03/03/2017 12:17	
WG604846-08	STD-CCV	01	03/03/2017 12:46	
WG604846-09	STD	01	03/03/2017 13:15	
WG604846-10	STD	01	03/03/2017 13:45	
WG604846-11	STD	01	03/03/2017 14:14	
WG604846-12	SSCV	01	03/03/2017 17:04	

* Sample past 12 hour tune limit



BFB

Login Number: L17021201 Tune ID: WG605280-01
 Instrument: HPMS8 Run Date: 03/07/2017
 Analyst: TMB Run Time: 10:13
 Workgroup: WG605280 File ID: 8M418189
 Cal ID: HPMS8-03-MAR-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	19.5	5812	PASS
75.0	95.0	30.0	60.0	50.7	15111	PASS
95.0	95.0	100	100	100	29794	PASS
96.0	95.0	5.00	9.00	6.87	2046	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	75.0	22351	PASS
175	174	5.00	9.00	6.80	1519	PASS
176	174	95.0	101	95.8	21409	PASS
177	176	5.00	9.00	6.46	1382	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG605280-02	CCV	01	03/07/2017 10:37	
WG605281-01	BLANK	01	03/07/2017 11:36	
WG605281-02	LCS	01	03/07/2017 12:05	
WG605281-03	LCS2	01	03/07/2017 12:35	
L17021201-02	LH18/24-SP650-6418-GRAB	01	03/07/2017 13:05	
L17021201-01	LH18/24-SP650-6418-GRAB	01	03/07/2017 13:35	

* Sample past 12 hour tune limit



Calibration Table Report
 Method: A9FOOWTR.M
 Title: A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Calibration: Thu Dec 08 13:41:47 2016
 Curve: WG594051
 Calibration Files

Compound											Avg	%RSD	
	5	20	50	100	200	300	400	500					
	8M116519.D	8M116520.D	8M116521.D	8M116522.D	8M116523.D	8M116524.D	8M116525.D	8M116526.D					
I Fluorobenzene	ISTD												
T Acetonitrile		0.007	0.007	0.008	0.007	0.007	0.007	0.007	0.007	0.007	0.007	2.734	
T 3-Chloro-1-propene	0.285	0.281	0.282	0.286	0.290	0.298	0.298	0.306	0.291	0.318	3.019		
T 2-Chloro-1,3-butadiene	0.282	0.298	0.305	0.315	0.325	0.335	0.338	0.343	0.318	0.318	6.789		
T Ethyl Acetate		0.065	0.063	0.064	0.066	0.064	0.067	0.066	0.065	0.065	2.080		
T Methacrylonitrile	0.032	0.041	0.043	0.043	0.044	0.044	0.046	0.045	0.042	0.042	10.556		
T Isobutyl Alcohol			0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	6.131		
T 1-Butanol										0.000	0.000		
T Methyl methacrylate	0.055	0.067	0.068	0.069	0.071	0.070	0.074	0.074	0.068	0.068	8.866		
T 2-Nitropropane		0.020	0.020	0.021	0.023	0.023	0.024	0.024	0.022	0.022	7.043		
I Chlorobenzene-d5	ISTD												
I 1,4-Dichlorobenzene-d4	ISTD												
T Cyclohexanone			0.007	0.008	0.008	0.008	0.008	0.008	0.008	0.008	7.809		

Thu Dec 08 15:05:15 2016

Calibration Table Report

Method: 8260WT.M

Title: Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8

Last Calibration: Fri Mar 03 15:26:23 2017

Curve: WG604846

Calibration Files

Compound	0.3 0.4 1 2 5 20 50 100 200 300										Avg	%RSD	Linear	Quad
	8M418138.D	8M418134.D	8M418135.D	8M418136.D	8M418137.D	8M418139.D	8M418140.D	8M418141.D	8M418142.D	8M418143.D				
I Fluorobenzene	ISTD													
T Dichlorodifluoromethane			0.305	0.299	0.315	0.358	0.367	0.363	0.356	0.314	0.335	8.548		
P Chloromethane			0.560	0.510	0.494	0.486	0.476	0.458	0.437	0.371	0.474	11.698		
C Vinyl Chloride	0.416	0.439	0.495	0.454	0.442	0.442	0.419	0.384	0.355	0.286	0.413	14.211		
T 1,3-Butadiene			0.278	0.290	0.296	0.197	0.128	0.111	0.091	0.091	0.199	45.231	1.008	
T Bromomethane			0.138	0.139	0.158	0.164	0.189	0.208	0.229	0.216	0.180	19.576	0.998	
T Chloroethane		0.129	0.182	0.167	0.177	0.179	0.187	0.190	0.197	0.181	0.177	11.081		
T Trichlorofluoromethane		0.394	0.440	0.411	0.437	0.429	0.441	0.444	0.440	0.410	0.427	4.168		
T Diethyl ether			0.158	0.161	0.162	0.161	0.173	0.173		0.174	0.166	4.099		
T Isoprene					0.356	0.361	0.383	0.404	0.408	0.383	0.382	5.548		
T Acrolein				0.020	0.021	0.021	0.023	0.024		0.025	0.022	8.318		
T 1,1,2-Trichloro-1,2,2-Trifluoroethane			0.228	0.228	0.258	0.253	0.259	0.264	0.261	0.240	0.249	5.862		
T Acetone					0.029	0.030	0.036	0.032	0.032	0.030	0.032	7.670		
C 1,1-Dichloroethene		0.392	0.380	0.349	0.378	0.373	0.395	0.400	0.402	0.363	0.382	4.692		
T Tert-Butyl Alcohol				0.010	0.010	0.010	0.011	0.010		0.010	0.010	5.163		
T Dimethyl Sulfide					0.257	0.266	0.287	0.295	0.304	0.290	0.283	6.322		
T Iodomethane			0.059	0.071	0.110	0.180	0.231	0.260	0.279	0.240	0.179	49.134	0.992	
T Methyl acetate					0.088	0.089	0.099	0.098	0.098	0.099	0.095	5.465		
T Methylene Chloride			0.261	0.262	0.262	0.257	0.267	0.269	0.278	0.261	0.265	2.527		
T Carbon Disulfide			0.805	0.765	0.798	0.802	0.841	0.861	0.870	0.770	0.814	4.826		
T Acrylonitrile			0.037	0.045	0.045	0.048	0.054	0.054			0.047	14.060		
T Methyl Tert Butyl Ether			0.449	0.466	0.477	0.491	0.543	0.514	0.505	0.488	0.491	6.004		
T trans-1,2-Dichloroethene		0.370	0.368	0.332	0.363	0.362	0.379	0.386	0.394	0.357	0.368	4.915		
T n-Hexane					0.355	0.341	0.353	0.362	0.368	0.337	0.353	3.361		
T Diisopropyl ether			0.731	0.729	0.746	0.747	0.783	0.785		0.731	0.750	3.249		
T Vinyl Acetate					0.291	0.268	0.295	0.291	0.267	0.277	0.282	4.447		
P 1,1-Dichloroethane		0.437	0.443	0.437	0.467	0.461	0.490	0.496	0.497	0.454	0.465	5.255		
T Ethyl-Tert-Butyl ether			0.663	0.678	0.676	0.685	0.729	0.721		0.680	0.690	3.555		
T 2-Butanone					0.050	0.051	0.056	0.053	0.051	0.054	0.053	4.459		
T Propionitrile			0.014	0.016	0.016	0.017	0.018	0.018		0.018	0.017	9.638		
T 2,2-Dichloropropane		0.404	0.400	0.373	0.406	0.381	0.403	0.403	0.406	0.367	0.394	3.946		
T cis-1,2-Dichloroethene		0.250	0.266	0.274	0.293	0.287	0.306	0.309	0.311	0.290	0.287	7.229		
C Chloroform	0.555	0.553	0.503	0.461	0.468	0.455	0.483	0.481	0.479	0.436	0.487	8.131		
T 1-Bromopropane			0.045	0.052	0.055	0.055	0.060	0.060	0.062	0.058	0.056	9.733		
T Bromochloromethane		0.137	0.151	0.142	0.161	0.160	0.171	0.168	0.164	0.154	0.156	7.256		
T Tetrahydrofuran			0.033	0.033	0.031	0.031	0.036	0.034		0.035	0.033	5.590		
S Dibromofluoromethane				0.241	0.258	0.251	0.266	0.265	0.265	0.250	0.257	3.722		
T 1,1,1-Trichloroethane		0.374	0.411	0.386	0.404	0.405	0.436	0.443	0.449	0.406	0.413	6.153		
T Cyclohexane			0.440	0.393	0.424	0.420	0.443	0.462	0.475	0.441	0.437	5.794		
T 1,1-Dichloropropene			0.332	0.313	0.358	0.349	0.366	0.374	0.377	0.343	0.351	6.217		
T Tert-Amyl-Methyl ether			0.531	0.565	0.564	0.561	0.610	0.599		0.579	0.573	4.591		
T Carbon Tetrachloride		0.346	0.37	0.339	0.377	0.381	0.406	0.412	0.407	0.375	0.3793	6.86898		
S 1,2-Dichloroethane-d4				0.219	0.22	0.219	0.241	0.232	0.228	0.217	0.225	3.90034		
T Heptane											0	0		
T 1,2-Dichloroethane		0.274	0.282	0.287	0.294	0.292	0.319	0.307	0.303	0.285	0.2936	4.72851		
T Benzene		1.014	1.023	0.987	1.05	1.019	1.07	1.058	1.021	0.88	1.0136	5.53904		
T Trichloroethene		0.284	0.293	0.27	0.288	0.288	0.305	0.307	0.317	0.293	0.2939	4.76806		
T Methylcyclohexane					0.432	0.42	0.442	0.453	0.46	0.427	0.4389	3.50107		
C 1,2-Dichloropropane		0.204	0.254	0.241	0.256	0.248	0.272	0.27	0.277	0.263	0.2539	8.67417		
T Bromodichloromethane		0.311	0.313	0.307	0.322	0.333	0.368	0.358	0.363	0.34	0.335	7.04048		
T 1,4-Dioxane					0.001	0.001	0.001	0.001		0.001	0.0012	14.5531		
T Dibromomethane		0.113	0.111	0.122	0.124	0.129	0.142	0.136	0.137	0.132	0.1273	8.5591		
T 2-Chloroethyl Vinyl Ether				0.097	0.101	0.111	0.125	0.118	0.12	0.121	0.1133	9.61538		
T 4-Methyl-2-Pentanone					0.04	0.049	0.056	0.052	0.052	0.053	0.0503	10.7829		
T cis-1,3-Dichloropropene		0.357	0.348	0.35	0.376	0.383	0.422	0.417	0.42	0.392	0.385	7.74459		

T	Dimethyl Disulfide				0.16	0.186	0.216	0.228	0.239	0.232	0.21	14.7103		
I	Chlorobenzene-d5	ISTD												
S	Toluene-d8			1.094	1.204	1.143	1.226	1.241	1.213	1.109	1.1757	5.07157		
C	Toluene	1.326	1.464	1.384	1.493	1.435	1.518	1.506	1.386	1.155	1.4075	8.12879		
T	Ethyl Methacrylate		0.183	0.22	0.239	0.274	0.311	0.309	0.307	0.306	0.2685	18.2722	1.000	
T	Paraldehyde										0	0		
T	trans-1,3-Dichloropropene		0.352	0.379	0.422	0.417	0.466	0.455	0.447	0.427	0.4207	9.16996		
T	1,1,2-Trichloroethane	0.202	0.216	0.229	0.223	0.229	0.257	0.243	0.24	0.235	0.2304	6.92857		
T	2-Hexanone				0.045	0.054	0.068	0.063	0.062	0.064	0.0593	13.9825		
T	1,3-Dichloropropane	0.323	0.379	0.379	0.39	0.391	0.438	0.415	0.408	0.391	0.3905	8.09478		
T	Tetrachloroethene	0.292	0.302	0.276	0.31	0.29	0.311	0.317	0.326	0.304	0.3033	5.02726		
T	Dibromochloromethane	0.25	0.255	0.273	0.283	0.303	0.346	0.336	0.336	0.324	0.3006	12.214		
T	1,2-Dibromoethane	0.186	0.188	0.227	0.222	0.232	0.257	0.245	0.241	0.234	0.2257	10.7466		
T	1-Chlorohexane	0.435	0.472	0.439	0.49	0.482	0.511	0.533	0.541	0.496	0.4889	7.56008		
P	Chlorobenzene	0.995	1.018	0.979	1.027	0.985	1.081	1.099	1.083	0.926	1.0213	5.59295		
T	1,1,1,2-Tetrachloroethane	0.291	0.315	0.33	0.346	0.353	0.406	0.415	0.44	0.402	0.3664	13.9833		
C	Ethylbenzene	0.533	0.523	0.507	0.546	0.54	0.605	0.639	0.68	0.615	0.5765	10.3995		
T	m-p-Xylene	0.611	0.633	0.621	0.672	0.656	0.725	0.748	0.71	0.57	0.6605	8.84592		
T	o-Xylene		0.6	0.588	0.64	0.632	0.703	0.715	0.739	0.674	0.6613	8.37023		
T	Styrene	0.888	0.891	0.899	1.032	1.078	1.21	1.202	1.164	0.998	1.0403	12.6642		
P	Bromoform		0.12	0.141	0.155	0.176	0.214	0.2	0.203	0.198	0.1759	19.2679	0.999	
T	Isopropylbenzene	1.545	1.645	1.54	1.698	1.667	1.819	1.764	1.608	1.291	1.6198	9.49754		
I	1,4-Dichlorobenzene-d4	ISTD												
P	1,1,2,2-Tetrachloroethane	0.356	0.417	0.467	0.473	0.473	0.549	0.494	0.474	0.469	0.4636	11.4246		
S	p-Bromofluorobenzene			0.768	0.872	0.841	0.898	0.906	0.908	0.864	0.8653	5.69728		
T	1,2,3-Trichloropropane		0.113	0.12	0.139	0.136	0.155	0.14	0.137	0.137	0.1346	9.66586		
T	trans-1,4-Dichloro-2-Butene		0.052	0.096	0.126	0.134	0.149	0.144	0.143	0.141	0.1231	27.0793	1.000	
T	n-Propylbenzene	3.653	3.787	3.585	3.928	3.791	3.996	3.776	3.177	2.507	3.5779	13.0291		
T	Bromobenzene	0.727	0.695	0.761	0.725	0.793	0.788	0.856	0.826	0.828	0.775	6.60272		
T	1,3,5-Trimethylbenzene		2.43	2.518	2.487	2.627	2.662	2.873	2.78	2.564	2.107	2.561	8.62404	
T	2-Chlorotoluene	2.415	2.461	2.372	2.548	2.564	2.634	2.535	2.313	1.881	2.4136	9.28132		
T	4-Chlorotoluene	1.912	2.129	2.05	2.225	2.055	2.346	2.293	2.138	1.804	2.1058	8.27163		
T	a-Methylstyrene				1.343	1.429	1.528	1.599	1.605	1.431	1.489	7.05606		
T	tert-Butylbenzene		0.524	0.549	0.561	0.575	0.624	0.628	0.657	0.608	0.5909	7.70005		
T	1,2,4-Trimethylbenzene	2.47	2.674	2.55	2.809	2.793	3.013	2.903	2.637	2.135	2.6649	9.81301		
T	sec-Butylbenzene		3.396	3.239	3.578	3.463	3.689	3.524	3.091	2.447	3.3034	11.9396		
T	p-Isopropyltoluene		2.692	2.603	2.925	2.912	3.13	3.022	2.718	2.178	2.7726	10.7756		
T	1,3-Dichlorobenzene	1.509	1.536	1.498	1.595	1.57	1.723	1.656	1.623	1.423	1.5703	5.78145		
T	1,4-Dichlorobenzene	1.453	1.59	1.588	1.535	1.578	1.553	1.707	1.618	1.589	1.389	5.62757		
T	n-Butylbenzene		2.714	2.556	2.834	2.797	2.983	2.852	2.554	2.05	2.6675	10.8627		
T	1,2-Dichlorobenzene	1.331	1.361	1.41	1.36	1.394	1.386	1.53	1.444	1.418	1.272	4.95935		
T	1,2-Dibromo-3-Chloropropane			0.048	0.066	0.075	0.092	0.08	0.079	0.078	0.0741	18.6579	0.997	
T	1,2,4-Trichlorobenzene	0.972	0.97	0.987	1.007	0.998	1.128	1.063	1.045	0.954	1.0138	5.492		
T	Hexachlorobutadiene	0.429	0.433	0.466	0.48	0.467	0.517	0.507	0.515	0.472	0.4762	6.86211		
T	Naphthalene		1.503	1.524	1.598	1.586	1.649	1.897	1.65	1.529	1.376	8.98264		
T	1,2,3-Trichlorobenzene	0.826	0.703	0.855	0.847	0.831	0.843	0.957	0.873	0.853	0.8	7.52358		

Mon Mar 06 12:18:35 2017

Login Number: L17021201 Run Date: 03/03/2017 Sample ID: WG604846-12
 Instrument ID: HPMS8 Run Time: 17:04 Method: 8260B
 File ID: 8M418148 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG604846 Cal ID: HPMS8 - 03-MAR-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	48.8	ug/L	0.372	2.50	20	
Chloroform	CCC	50.0	47.7	ug/L	0.465	4.60	20	
Ethylbenzene	CCC	50.0	48.0	ug/L	0.554	3.90	20	
Toluene	CCC	50.0	49.9	ug/L	1.41	0.100	20	
Vinyl Chloride	CCC	50.0	44.1	ug/L	0.364	11.8	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	52.6	ug/L	0.488	5.20	20	
Chlorobenzene	SPCC	50.0	48.1	ug/L	0.982	3.80	20	
Chloromethane	SPCC	50.0	50.1	ug/L	0.475	0.300	20	
Bromoform	SPCC	50.0	46.1	ug/L	0.183	7.80	20	
1,1-Dichloroethane	SPCC	50.0	49.5	ug/L	0.460	0.900	20	
m-,p-Xylene		100	101	ug/L	0.669	1.30	20	
o-Xylene		50.0	48.7	ug/L	0.644	2.60	20	
1,1,1-Trichloroethane		50.0	51.1	ug/L	0.422	2.30	20	
1,1,2-Trichloroethane		50.0	48.9	ug/L	0.225	2.10	20	
1,2-Dichloroethane		50.0	49.1	ug/L	0.289	1.70	20	
Acetone		50.0	47.6	ug/L	0.0302	4.80	20	
Benzene		50.0	49.3	ug/L	0.998	1.50	20	
Carbon Tetrachloride		50.0	50.5	ug/L	0.383	1.10	20	
Methylene Chloride		50.0	48.6	ug/L	0.257	2.90	20	
Styrene		50.0	53.0	ug/L	1.10	6.10	20	
Tetrachloroethene		50.0	48.2	ug/L	0.293	3.50	20	
Trichloroethene		50.0	47.1	ug/L	0.277	5.80	20	
Xylenes		150	150	ug/L	0.656	0	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17021201 Run Date: 03/07/2017 Sample ID: WG605280-02
Instrument ID: HPMS8 Run Time: 10:37 Method: 8260B
File ID: 8M418190 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG605281 Cal ID: HPMS8 - 03-MAR-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	51.0	ug/L	0.259	1.96	20	
1,1-Dichloroethene	CCC	50.0	50.0	ug/L	0.382	0.0992	20	
Chloroform	CCC	50.0	48.1	ug/L	0.469	3.72	20	
Ethylbenzene	CCC	50.0	49.8	ug/L	0.574	0.486	20	
Toluene	CCC	50.0	51.7	ug/L	1.46	3.47	20	
Vinyl Chloride	CCC	50.0	56.7	ug/L	0.468	13.3	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	49.8	ug/L	0.461	0.487	20	
Bromoform	SPCC	50.0	45.4	ug/L	0.181	9.15	20	
Chlorobenzene	SPCC	50.0	49.9	ug/L	1.02	0.223	20	
Chloromethane	SPCC	50.0	52.7	ug/L	0.499	5.40	20	
1,1-Dichloroethane	SPCC	50.0	50.9	ug/L	0.473	1.78	20	
m-,p-Xylene		100	106	ug/L	0.698	5.65	20	
o-Xylene		50.0	50.3	ug/L	0.666	0.639	20	
1,1,1-Trichloroethane		50.0	51.2	ug/L	0.422	2.31	20	
1,1,2-Trichloroethane		50.0	47.9	ug/L	0.221	4.27	20	
1,2-Dichloroethane		50.0	48.8	ug/L	0.286	2.46	20	
Acetone		50.0	46.0	ug/L	0.0292	7.93	20	
Benzene		50.0	51.4	ug/L	1.04	2.87	20	
Carbon Tetrachloride		50.0	51.9	ug/L	0.394	3.81	20	
Methylene Chloride		50.0	48.4	ug/L	0.256	3.16	20	
Styrene		50.0	54.0	ug/L	1.12	7.94	20	
Tetrachloroethene		50.0	49.6	ug/L	0.301	0.893	20	
Trichloroethene		50.0	50.3	ug/L	0.296	0.540	20	
Xylenes		150	156	ug/L	0.682	3.98	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5186905
Report generated 03/07/2017 15:05



Login Number: L17021201
Instrument ID: HPMS8
Workgroup (AAB#): WG605281

ICAL CCV Number: WG604846-08
CAL ID: HPMS8-03-MAR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG604846-08	NA	NA	278577	509436	654600
Upper Limit	NA	NA	557154	1018872	1309200
Lower Limit	NA	NA	139289	254718	327300
<u>L17021201-01</u>	1.00	01	<u>252255</u>	<u>478713</u>	<u>618029</u>
L17021201-02	1.00	01	255342	490342	640602
WG605281-01	1.00	01	245647	472940	617093
WG605281-02	1.00	01	272325	496660	630276
WG605281-03	1.00	01	281255	512195	650606

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Microbac Laboratories Inc.
 INTERNAL STANDARD RETENTION TIME SUMMARY
 (COMPARED TO MIDPOINT OF ICAL)

00842320

Login Number: L17021201
 Instrument ID: HPMS8
 Workgroup (AAB#): WG605281

ICAL CCV Number: WG604846-08
 CAL ID: HPMS8-03-MAR-17
 Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG604846-08	NA	NA	17.88	14.84	10.95
Upper Limit	NA	NA	18.38	15.34	11.45
Lower Limit	NA	NA	17.38	14.34	10.45
<u>L17021201-01</u>	1.00	01	17.88	14.84	10.95
<u>L17021201-02</u>	1.00	01	17.88	14.84	10.95
WG605281-01	1.00	01	17.87	14.84	10.95
WG605281-02	1.00	01	17.88	14.84	10.95
WG605281-03	1.00	01	17.88	14.84	10.95

IS-1 - 1,4-Dichlorobenzene-d4
 IS-2 - Chlorobenzene-d5
 IS-3 - Fluorobenzene

Underline = Response outside limits



2.1.1.3 Sample Data

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418196.D Vial: 8
 Acq On : 7 Mar 2017 13:35 Operator: TMB
 Sample : L17021201-01 B 826-SPE Inst : HPMS8
 Misc : 1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 13:59:56 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

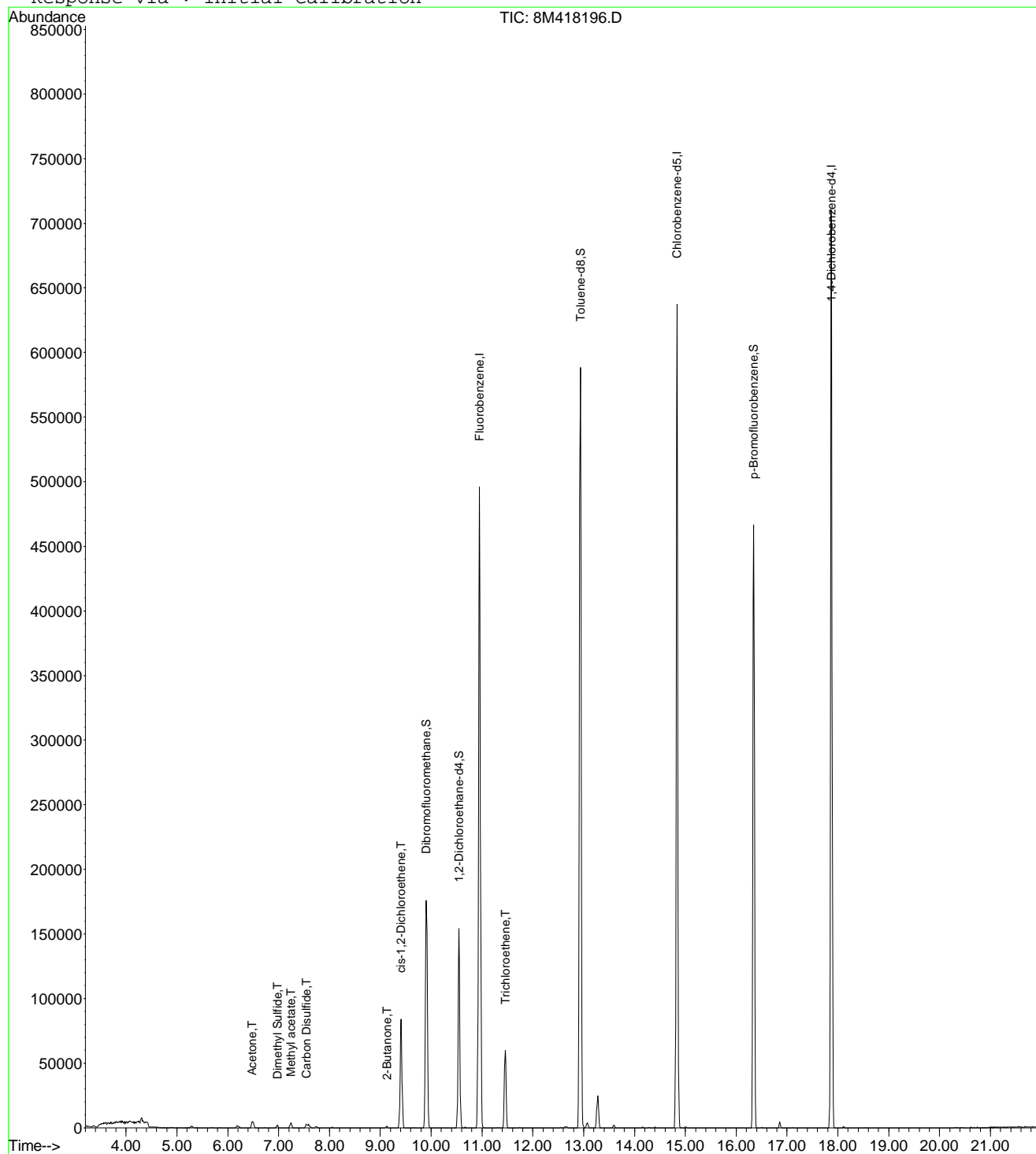
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	618029	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	478713	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	252255	25.00	ug/L	0.00
System Monitoring Compounds						
37) Dibromofluoromethane	9.90	111	148369	23.3749	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	93.48%	
43) 1,2-Dichloroethane-d4	10.55	65	134949	24.2579	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	97.04%	
58) Toluene-d8	12.93	98	532427	23.6490	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	94.60%	
80) p-Bromofluorobenzene	16.35	95	208327	23.8608	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	95.44%	
Target Compounds						
						Qvalue
13) Acetone	6.48	43	10491	13.3731	ug/L	93
16) Dimethyl Sulfide	6.98	62	2040	0.2914	ug/L	80
18) Methyl acetate	7.24	43	7562	3.2122	ug/L #	90
20) Carbon Disulfide	7.55	76	4139	0.2057	ug/L #	74
29) 2-Butanone	9.13	43	2182	1.6808	ug/L #	50
32) cis-1,2-Dichloroethene	9.41	96	50472	7.1071	ug/L	77
47) Trichloroethene	11.46	130	26890	3.7011	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418196.D 8260WT.M Tue Mar 07 13:59:59 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418196.D Vial: 8
Acq On : 7 Mar 2017 13:35 Operator: TMB
Sample : L17021201-01 B 826-SPE Inst : HPMS8
Misc : 1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 7 13:59 2017 Quant Results File: 8260WT.RES

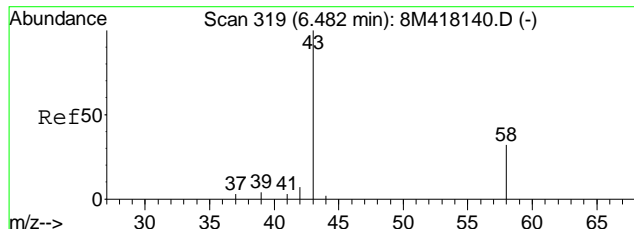
Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Mon Mar 06 12:17:52 2017
Response via : Initial Calibration



8M418196.D 8260WT.M

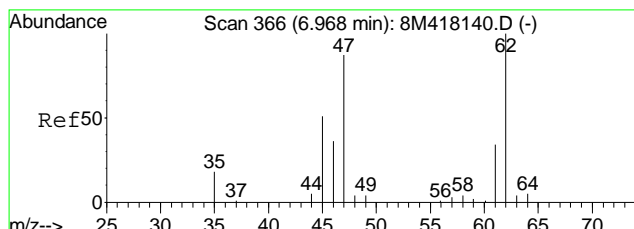
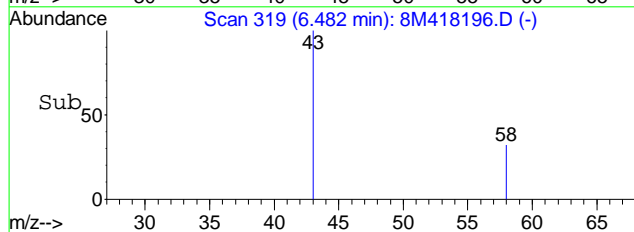
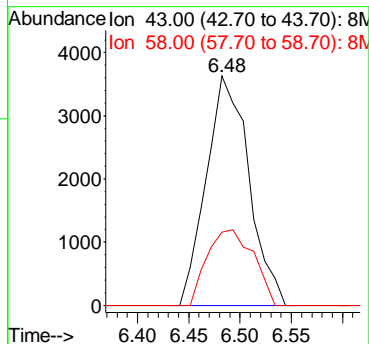
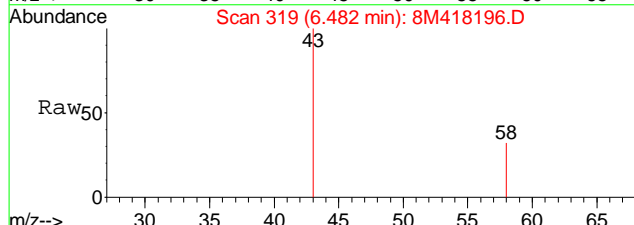
Tue Mar 07 13:59:59 2017

Page 2



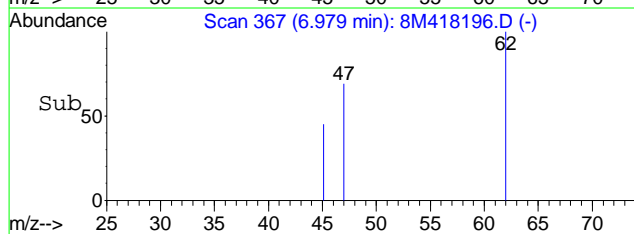
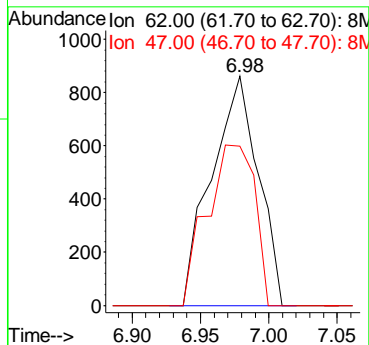
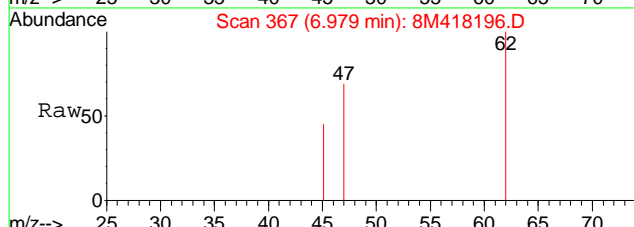
#13
 Acetone
 Concen: 13.37 ug/L
 RT: 6.48 min Scan# 319
 Delta R.T. 0.00 min
 Lab File: 8M418196.D
 Acq: 7 Mar 2017 13:35

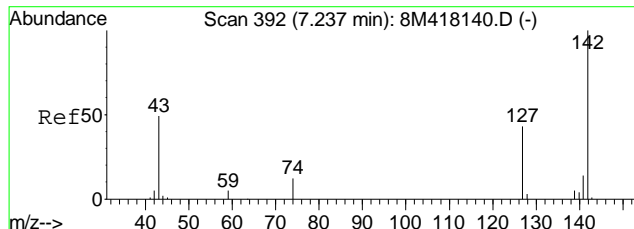
Tgt Ion	Ratio	Lower	Upper
43	100		
58	35.7	19.0	44.4



#16
 Dimethyl Sulfide
 Concen: 0.29 ug/L
 RT: 6.98 min Scan# 367
 Delta R.T. 0.01 min
 Lab File: 8M418196.D
 Acq: 7 Mar 2017 13:35

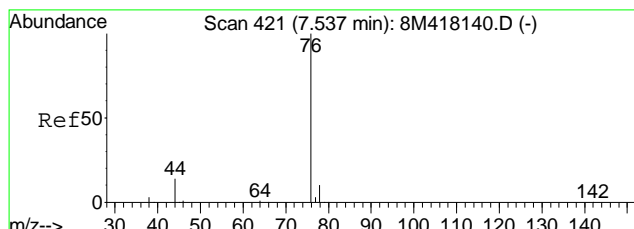
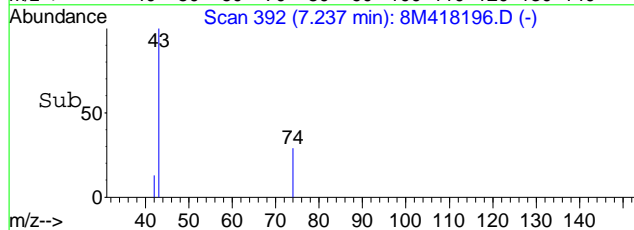
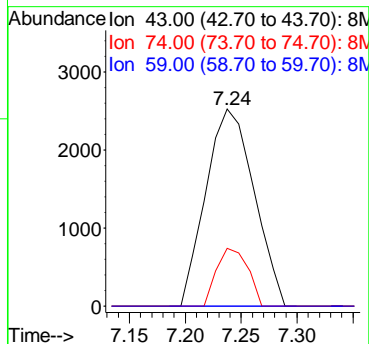
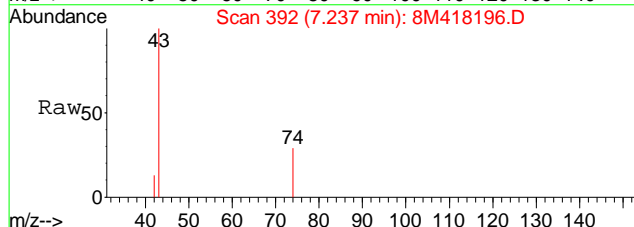
Tgt Ion	Ratio	Lower	Upper
62	100		
47	71.7	54.5	127.3





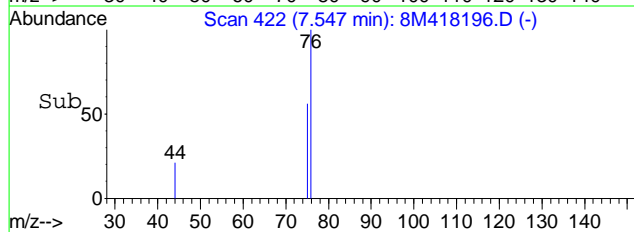
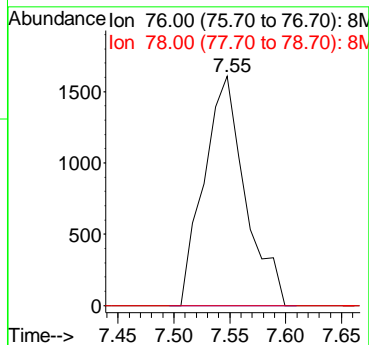
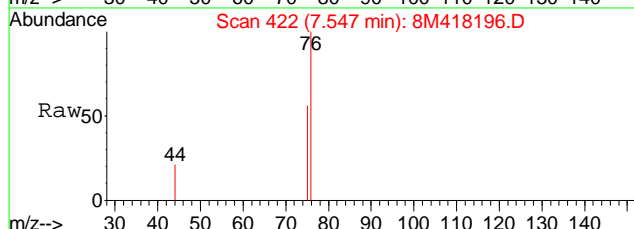
#18
Methyl acetate
Concen: 3.21 ug/L
RT: 7.24 min Scan# 392
Delta R.T. 0.00 min
Lab File: 8M418196.D
Acq: 7 Mar 2017 13:35

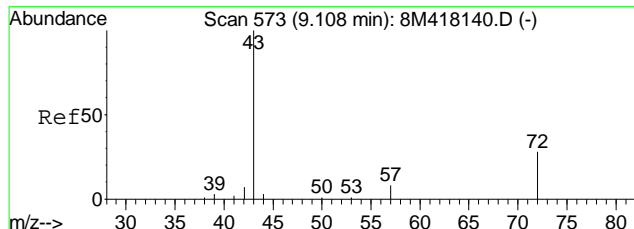
Tgt Ion	Ratio	Lower	Upper
43	100		
74	19.1	13.1	30.5
59	0.0	4.7	11.1#



#20
Carbon Disulfide
Concen: 0.21 ug/L
RT: 7.55 min Scan# 422
Delta R.T. 0.01 min
Lab File: 8M418196.D
Acq: 7 Mar 2017 13:35

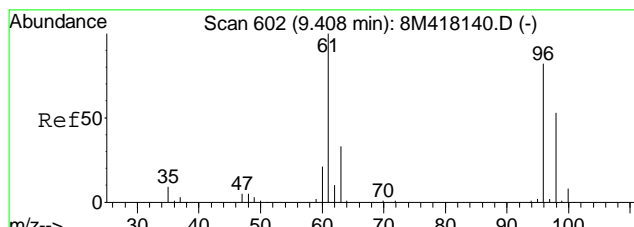
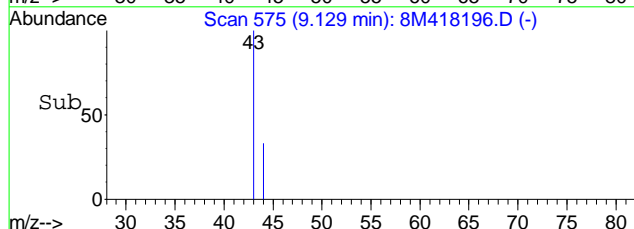
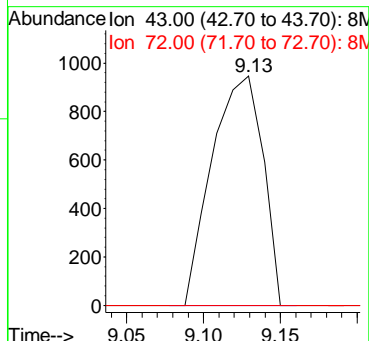
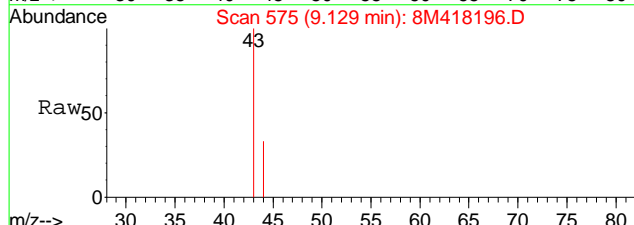
Tgt Ion	Ratio	Lower	Upper
76	100		
78	0.0	5.8	13.4#





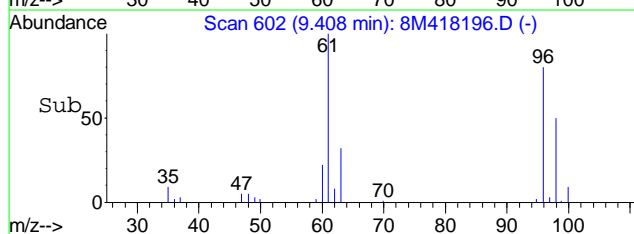
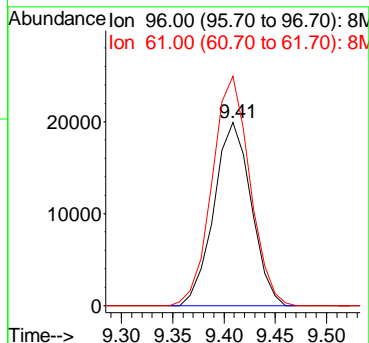
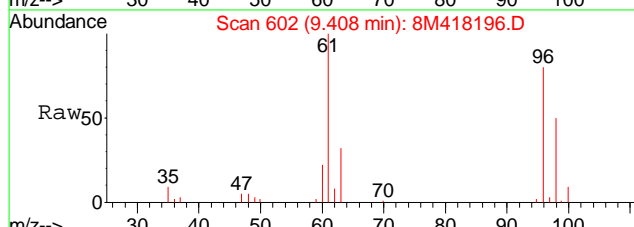
#29
 2-Butanone
 Concen: 1.68 ug/L
 RT: 9.13 min Scan# 575
 Delta R.T. 0.01 min
 Lab File: 8M418196.D
 Acq: 7 Mar 2017 13:35

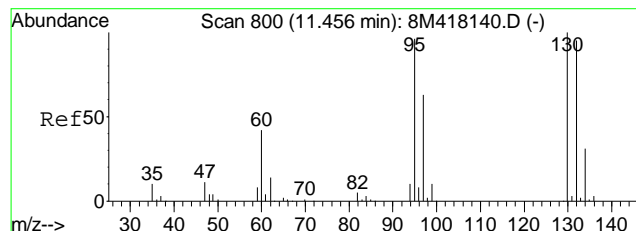
Tgt Ion	Ratio	Lower	Upper
43	100		
72	0.0	14.9	34.7#



#32
 cis-1,2-Dichloroethene
 Concen: 7.11 ug/L
 RT: 9.41 min Scan# 602
 Delta R.T. 0.00 min
 Lab File: 8M418196.D
 Acq: 7 Mar 2017 13:35

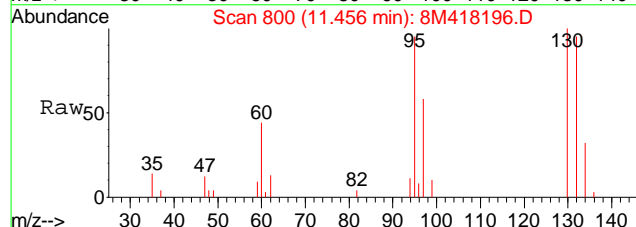
Tgt Ion	Ratio	Lower	Upper
96	100		
61	126.6	93.9	219.1



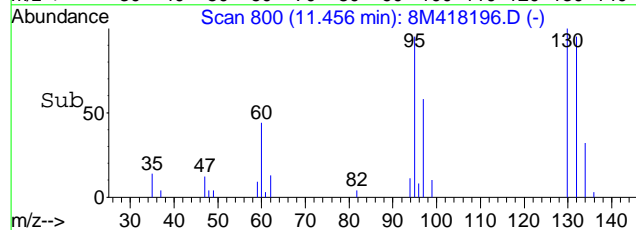
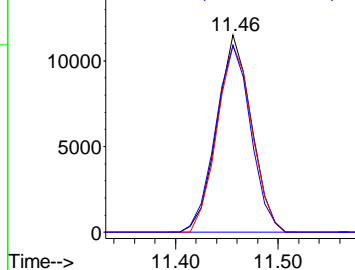


#47
 Trichloroethene
 Concen: 3.70 ug/L
 RT: 11.46 min Scan# 800
 Delta R.T. 0.00 min
 Lab File: 8M418196.D
 Acq: 7 Mar 2017 13:35

Tgt Ion	Resp	Lower	Upper
130	100		
132	96.2	57.5	134.3
95	97.2	59.7	139.3



Abundance Ion 130.00 (129.70 to 130.70):
 Ion 132.00 (131.70 to 132.70):
 Ion 95.00 (94.70 to 95.70): 8N



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418195.D Vial: 7
 Acq On : 7 Mar 2017 13:05 Operator: TMB
 Sample : L17021201-02 B TB 826-SPE Inst : HPMS8
 Misc : 1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 13:59:51 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

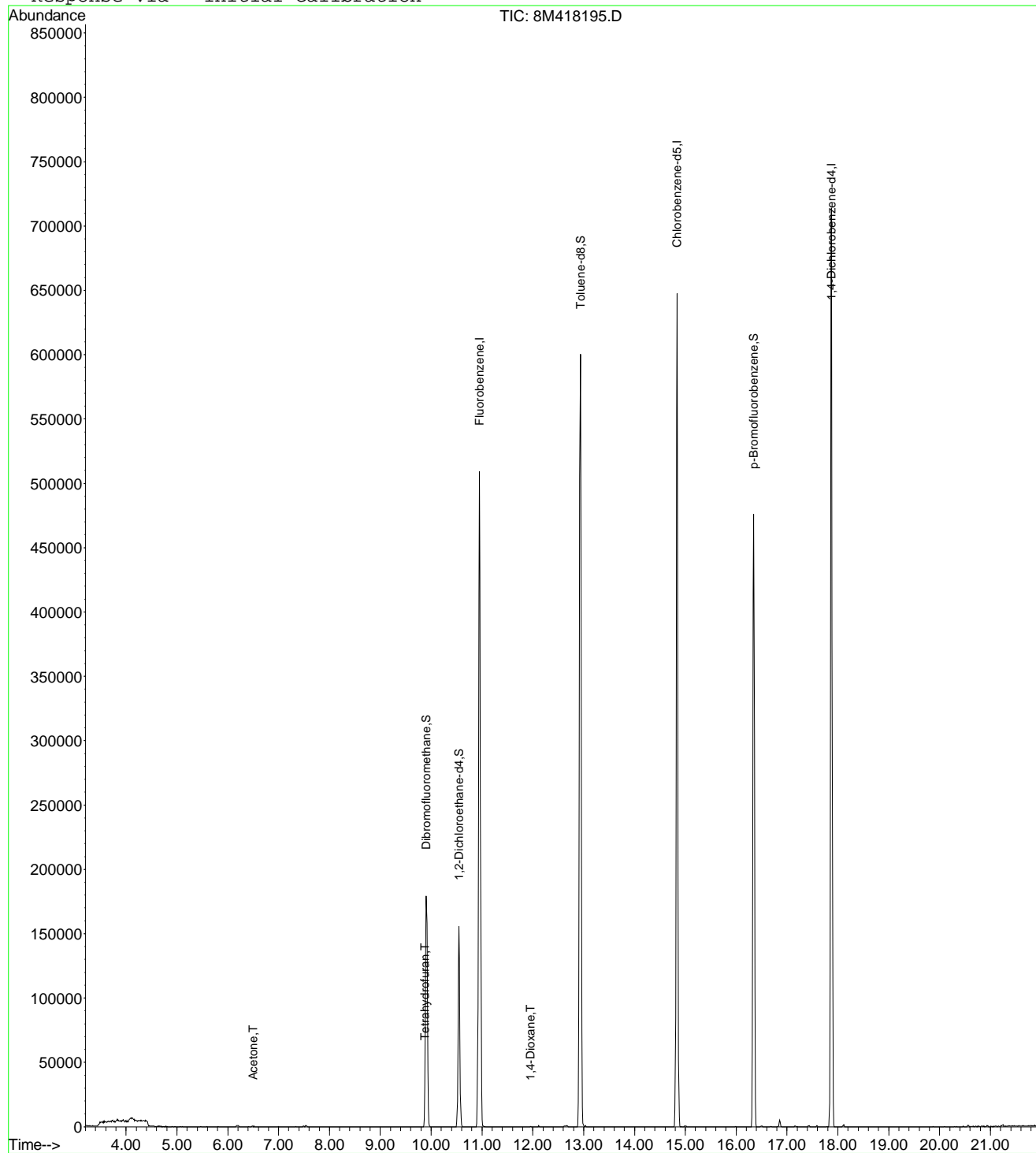
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	640602	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	490342	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	255342	25.00	ug/L	0.00
System Monitoring Compounds						
37) Dibromofluoromethane	9.91	111	151180	22.9785	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	91.92%	
43) 1,2-Dichloroethane-d4	10.55	65	136203	23.6206	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	94.48%	
58) Toluene-d8	12.93	98	545712	23.6642	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	94.64%	
80) p-Bromofluorobenzene	16.35	95	211914	23.9782	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	95.92%	
Target Compounds						
						Qvalue
13) Acetone	6.49	43	1175	1.4450	ug/L #	43
36) Tetrahydrofuran	9.87	42	765	0.8958	ug/L #	31
51) 1,4-Dioxane	11.95	88	373	11.8538	ug/L #	21

(#) = qualifier out of range (m) = manual integration
 8M418195.D 8260WT.M Tue Mar 07 13:59:54 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418195.D Vial: 7
Acq On : 7 Mar 2017 13:05 Operator: TMB
Sample : L17021201-02 B TB 826-SPE Inst : HPMS8
Misc : 1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 7 13:59 2017 Quant Results File: 8260WT.RES

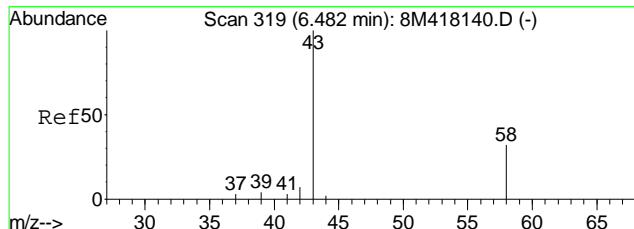
Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Mon Mar 06 12:17:52 2017
Response via : Initial Calibration



8M418195.D 8260WT.M

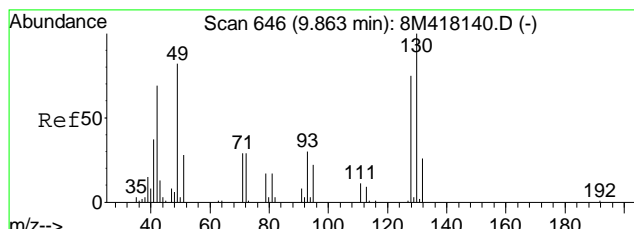
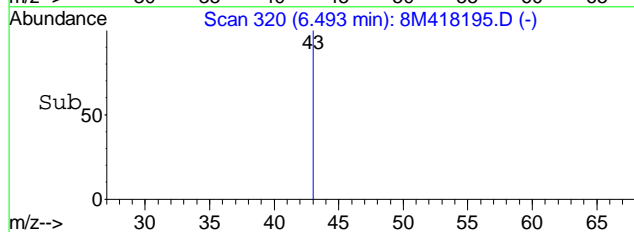
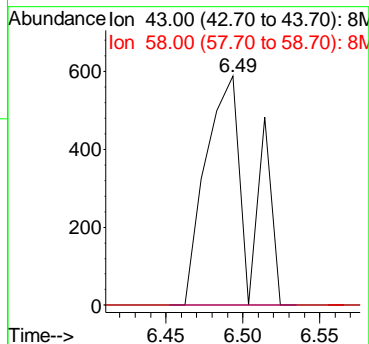
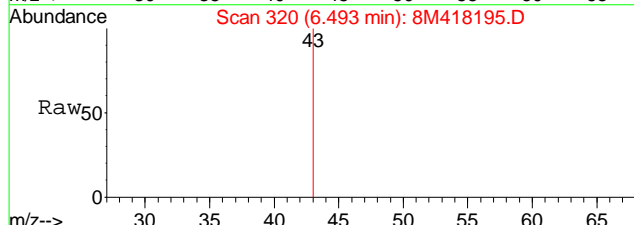
Tue Mar 07 13:59:54 2017

Page 2



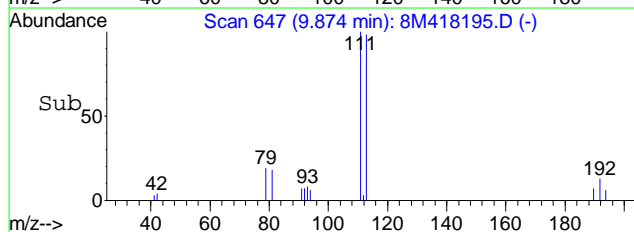
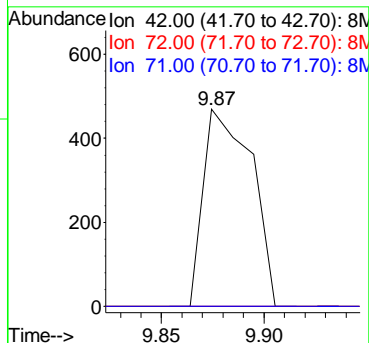
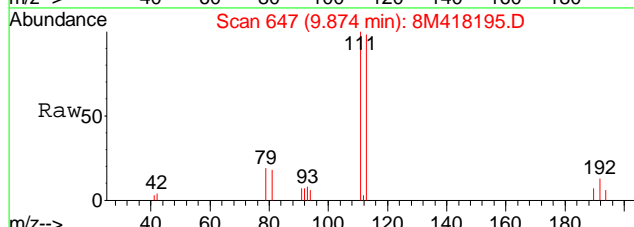
#13
 Acetone
 Concen: 1.45 ug/L
 RT: 6.49 min Scan# 320
 Delta R.T. 0.01 min
 Lab File: 8M418195.D
 Acq: 7 Mar 2017 13:05

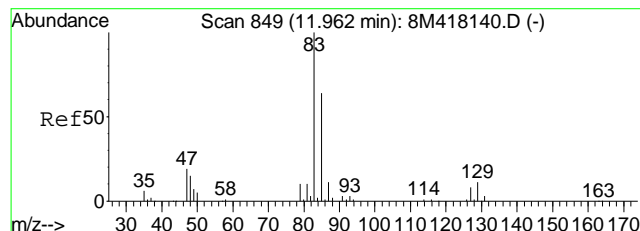
Tgt Ion	Ratio	Lower	Upper
43	100		
58	0.0	19.0	44.4#



#36
 Tetrahydrofuran
 Concen: 0.90 ug/L
 RT: 9.87 min Scan# 647
 Delta R.T. 0.00 min
 Lab File: 8M418195.D
 Acq: 7 Mar 2017 13:05

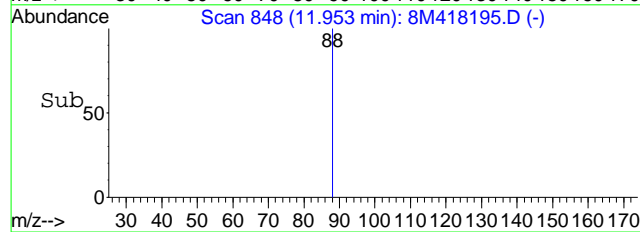
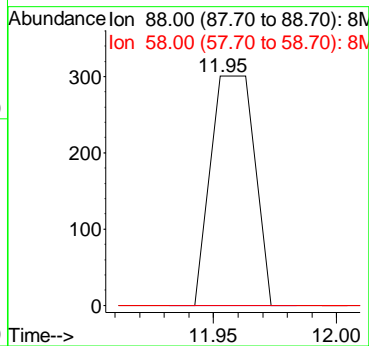
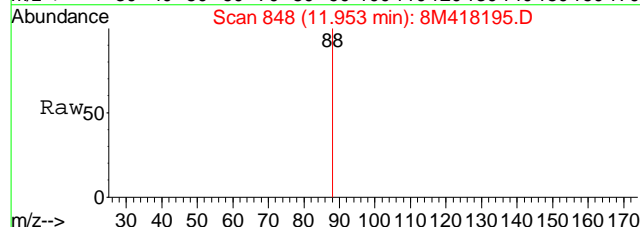
Tgt Ion	Ratio	Lower	Upper
42	100		
72	0.0	27.8	64.8#
71	0.0	25.9	60.5#





#51
 1,4-Dioxane
 Concen: 11.85 ug/L
 RT: 11.95 min Scan# 848
 Delta R.T. -0.01 min
 Lab File: 8M418195.D
 Acq: 7 Mar 2017 13:05

Tgt Ion	Ratio	Lower	Upper
88	100		
58	0.0	35.5	82.7#



2.1.1.4 Standards Data

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416519.D Vial: 2
 Acq On : 8 Dec 2016 9:19 Operator: TMB
 Sample : WG594051-02 5ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:33:51 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIion	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	524008	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	364349	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	144698	25.00	ug/L	0.00

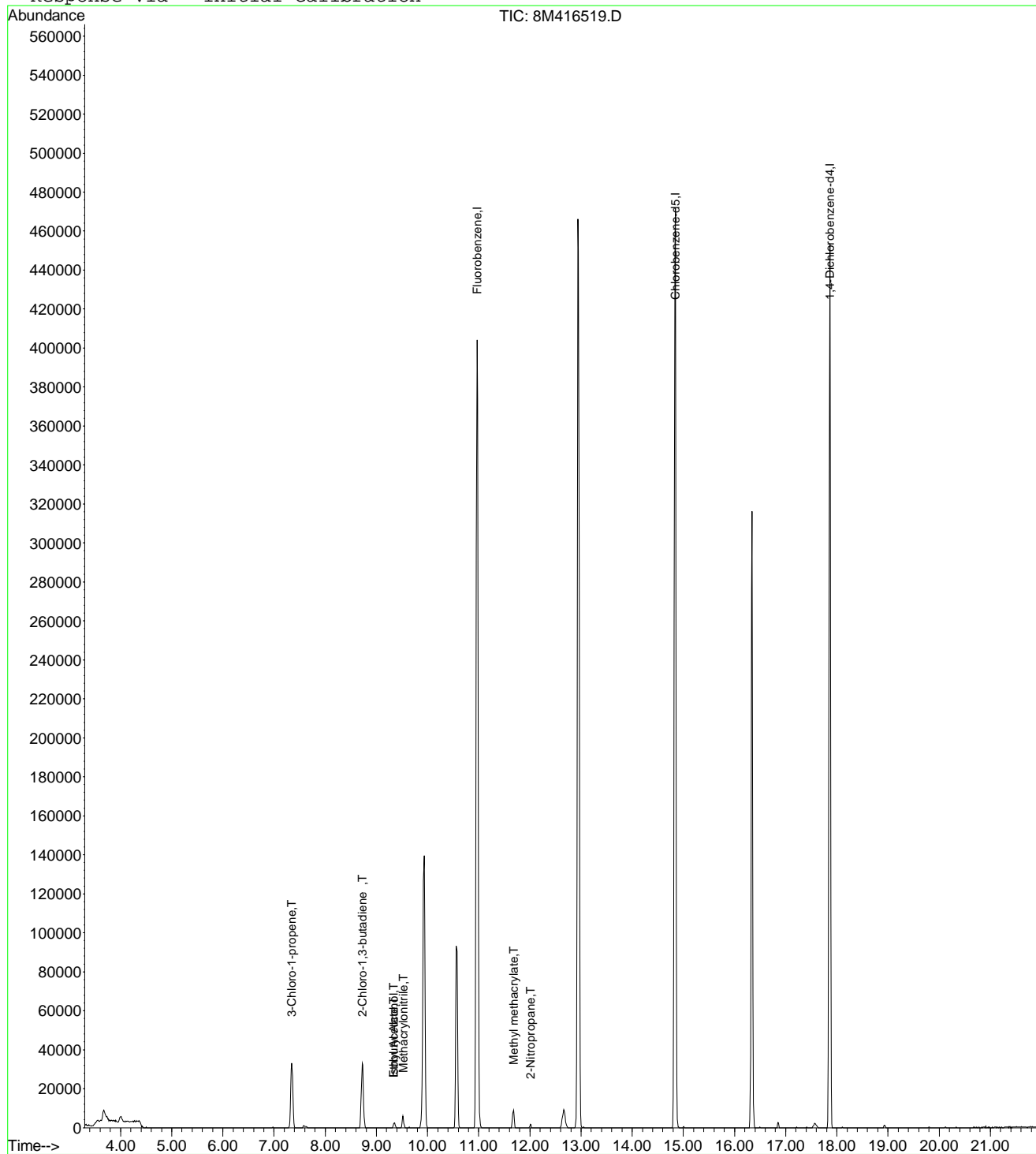
Target Compounds	R.T.	QIion	Response	Conc	Units	Qvalue
3) 3-Chloro-1-propene	7.35	41	29881	4.9041	ug/L	96
4) 2-Chloro-1,3-butadiene	8.72	53	29557	4.4384	ug/L	94
5) Ethyl Acetate	9.34	43	5291	3.8864	ug/L #	59
6) Methacrylonitrile	9.53	67	3339	3.7723	ug/L	88
7) Isobutyl Alcohol	9.34	43	5291	117.7955	ug/L #	10
9) Methyl methacrylate	11.68	41	5754	4.0085	ug/L	90
10) 2-Nitropropane	12.01	43	1384	2.9662	ug/L	98

 (#) = qualifier out of range (m) = manual integration
 8M416519.D A9FOOWTR.M Thu Dec 08 14:33:52 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416519.D Vial: 2
 Acq On : 8 Dec 2016 9:19 Operator: TMB
 Sample : WG594051-02 5ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 8 14:33 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416519.D Vial: 2
 Acq On : 8 Dec 2016 9:19 Operator: TMB
 Sample : WG594051-02 5ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 1% Max. R.T. Dev 0.50min
 Max. RRF Dev : 75% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Acetonitrile	-1.0000	0.0000	0.0	0	-6.97#
3 T	3-Chloro-1-propene	5.0000	4.9041	1.9	100	0.00
4 T	2-Chloro-1,3-butadiene	5.0000	4.4384	11.2	100	0.00
5 T	Ethyl Acetate	-1.0000	3.8864	0.0	0	0.00
6 T	Methacrylonitrile	5.0000	3.7723	24.6	100	0.00
7 T	Isobutyl Alcohol	-1.0000	117.7955	0.0	0	-0.18
8 T	1-Butanol	-1.0000	0.0000	0.0	0	-10.45#
9 T	Methyl methacrylate	5.0000	4.0085	19.8	100	0.00
10 T	2-Nitropropane	-1.0000	2.9662	0.0	0	0.00
11 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
12 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
13 T	Cyclohexanone	-1.0000	0.0000	0.0	0	-16.11#

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M416519.D A9FOOWTR.M Thu Dec 08 14:40:29 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416520.D Vial: 3
 Acq On : 8 Dec 2016 9:48 Operator: TMB
 Sample : WG594051-03 20ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:33:53 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	562112	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	401339	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	163574	25.00	ug/L	0.00

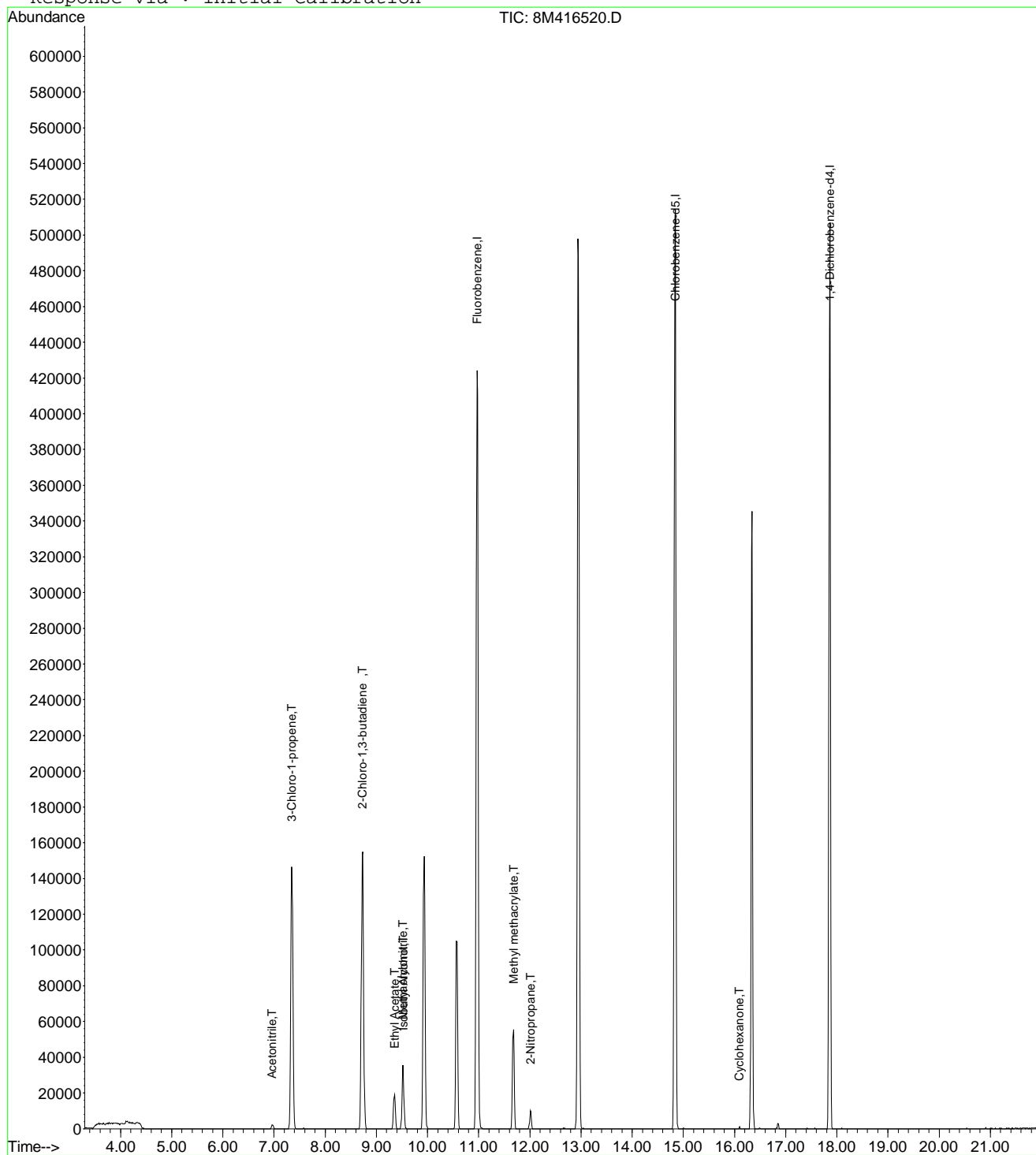
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.96	41	3251	20.0530	ug/L	86
3) 3-Chloro-1-propene	7.35	41	126513	19.3558	ug/L	94
4) 2-Chloro-1,3-butadiene	8.72	53	133862	18.7385	ug/L	93
5) Ethyl Acetate	9.35	43	29216	20.0054	ug/L	96
6) Methacrylonitrile	9.52	67	18458	19.4399	ug/L	89
7) Isobutyl Alcohol	9.53	43	1383	28.7031	ug/L #	86
9) Methyl methacrylate	11.68	41	30029	19.5014	ug/L	97
10) 2-Nitropropane	12.01	43	9171	18.3231	ug/L	92
13) Cyclohexanone	16.09	55	573	11.3348	ug/L #	22

 (#) = qualifier out of range (m) = manual integration
 8M416520.D A9FOOWTR.M Thu Dec 08 14:33:55 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416520.D Vial: 3
 Acq On : 8 Dec 2016 9:48 Operator: TMB
 Sample : WG594051-03 20ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 8 14:33 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416520.D Vial: 3
 Acq On : 8 Dec 2016 9:48 Operator: TMB
 Sample : WG594051-03 20ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 1% Max. R.T. Dev 0.50min
 Max. RRF Dev : 75% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Acetonitrile	20.0000	20.0530	-0.3	100	0.00
3 T	3-Chloro-1-propene	20.0000	19.3558	3.2	100	0.00
4 T	2-Chloro-1,3-butadiene	20.0000	18.7385	6.3	100	0.00
5 T	Ethyl Acetate	20.0000	20.0054	-0.0	100	0.00
6 T	Methacrylonitrile	20.0000	19.4399	2.8	100	0.00
7 T	Isobutyl Alcohol	-1.0000	28.7031	0.0	0	0.00
8 T	1-Butanol	-1.0000	0.0000	0.0	0	-10.45#
9 T	Methyl methacrylate	20.0000	19.5014	2.5	100	0.00
10 T	2-Nitropropane	20.0000	18.3231	8.4	100	0.00
11 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
12 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
13 T	Cyclohexanone	-1.0000	11.3348	0.0	0	-0.01

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M416520.D A9FOOWTR.M Thu Dec 08 14:40:47 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416521.D Vial: 4
 Acq On : 8 Dec 2016 10:17 Operator: TMB
 Sample : WG594051-04 50ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:33:56 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	564001	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	394560	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	164538	25.00	ug/L	0.00

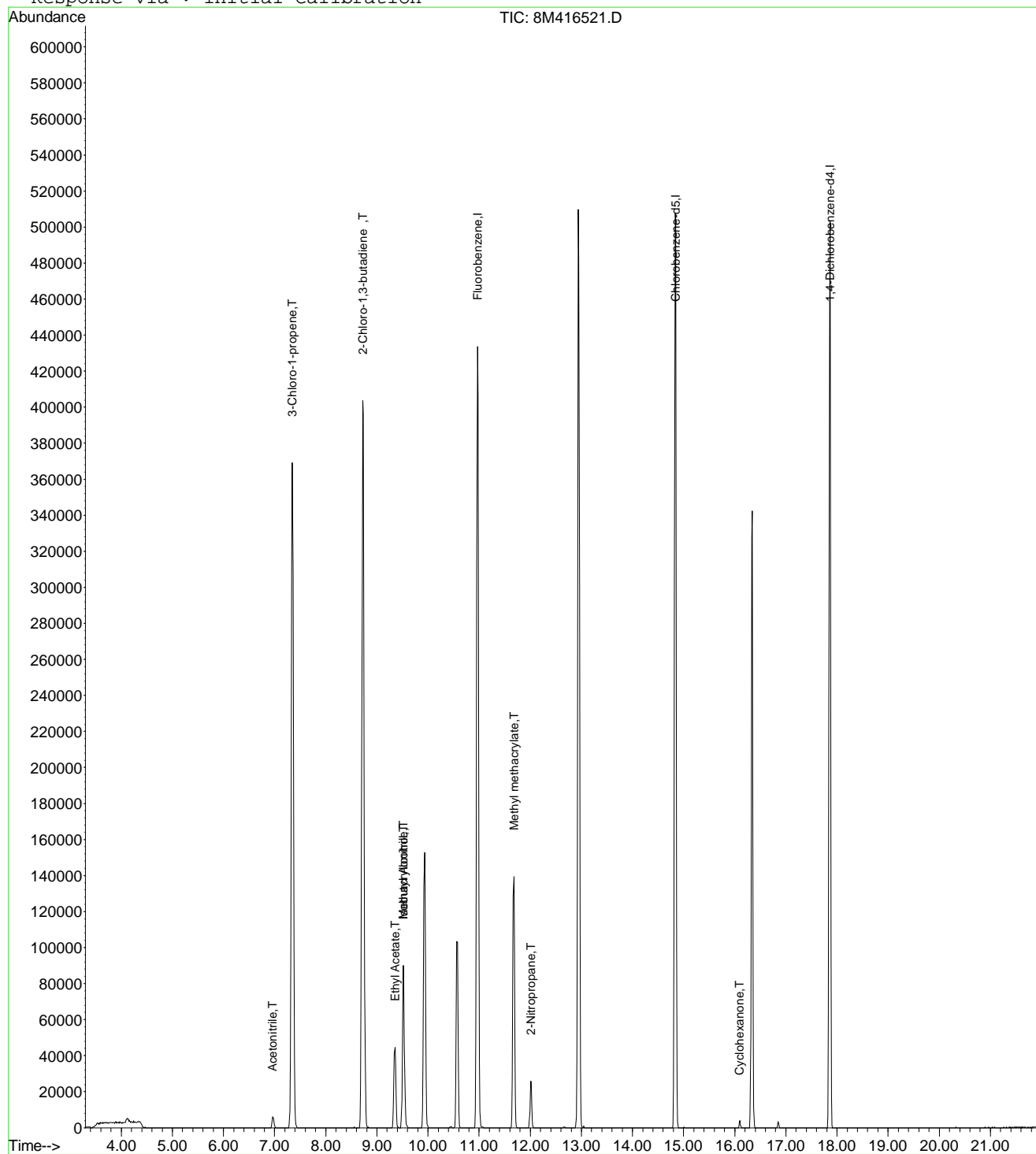
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.96	41	7864	48.3447	ug/L	100
3) 3-Chloro-1-propene	7.35	41	318087	48.5026	ug/L	96
4) 2-Chloro-1,3-butadiene	8.72	53	344272	48.0312	ug/L	93
5) Ethyl Acetate	9.35	43	70890	48.3788	ug/L	100
6) Methacrylonitrile	9.52	67	48404	50.8082	ug/L	93
7) Isobutyl Alcohol	9.52	43	4449	92.0262	ug/L #	94
9) Methyl methacrylate	11.68	41	76637	49.6027	ug/L	97
10) 2-Nitropropane	12.01	43	23103	46.0039	ug/L	95
13) Cyclohexanone	16.09	55	2163	42.5368	ug/L	98

 (#) = qualifier out of range (m) = manual integration
 8M416521.D A9FOOWTR.M Thu Dec 08 14:33:58 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416521.D Vial: 4
Acq On : 8 Dec 2016 10:17 Operator: TMB
Sample : WG594051-04 50ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79185 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 14:33 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416521.D A9FOOWTR.M

Thu Dec 08 14:33:58 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416521.D Vial: 4
 Acq On : 8 Dec 2016 10:17 Operator: TMB
 Sample : WG594051-04 50ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 1% Max. R.T. Dev 0.50min
 Max. RRF Dev : 75% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Acetonitrile	50.0000	48.3447	3.3	100	0.00
3 T	3-Chloro-1-propene	50.0000	48.5026	3.0	100	0.00
4 T	2-Chloro-1,3-butadiene	50.0000	48.0312	3.9	100	0.00
5 T	Ethyl Acetate	50.0000	48.3788	3.2	100	0.00
6 T	Methacrylonitrile	50.0000	50.8082	-1.6	100	0.00
7 T	Isobutyl Alcohol	100.0000	92.0262	8.0	100	0.00
8 T	1-Butanol	-1.0000	0.0000	0.0	0	-0.01
9 T	Methyl methacrylate	50.0000	49.6027	0.8	100	0.00
10 T	2-Nitropropane	50.0000	46.0039	8.0	100	0.00
11 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
12 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
13 T	Cyclohexanone	50.0000	42.5368	14.9	100	-0.01

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M416521.D A9FOOWTR.M Thu Dec 08 14:41:01 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416522.D Vial: 5
 Acq On : 8 Dec 2016 10:47 Operator: TMB
 Sample : WG594051-05 100ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:33:59 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIion	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	591526	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	415270	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	167978	25.00	ug/L	0.00

Target Compounds	R.T.	QIion	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	17844	104.5933	ug/L	96
3) 3-Chloro-1-propene	7.35	41	676105	98.2967	ug/L	97
4) 2-Chloro-1,3-butadiene	8.72	53	745903	99.2224	ug/L	94
5) Ethyl Acetate	9.35	43	151658	98.6828	ug/L	100
6) Methacrylonitrile	9.52	67	101361	101.4448	ug/L	99
7) Isobutyl Alcohol	9.53	43	10092	199.0363	ug/L	96
9) Methyl methacrylate	11.68	41	163688	101.0159	ug/L	97
10) 2-Nitropropane	12.01	43	50322	95.5410	ug/L	95
13) Cyclohexanone	16.11	55	5170	99.5894	ug/L	97

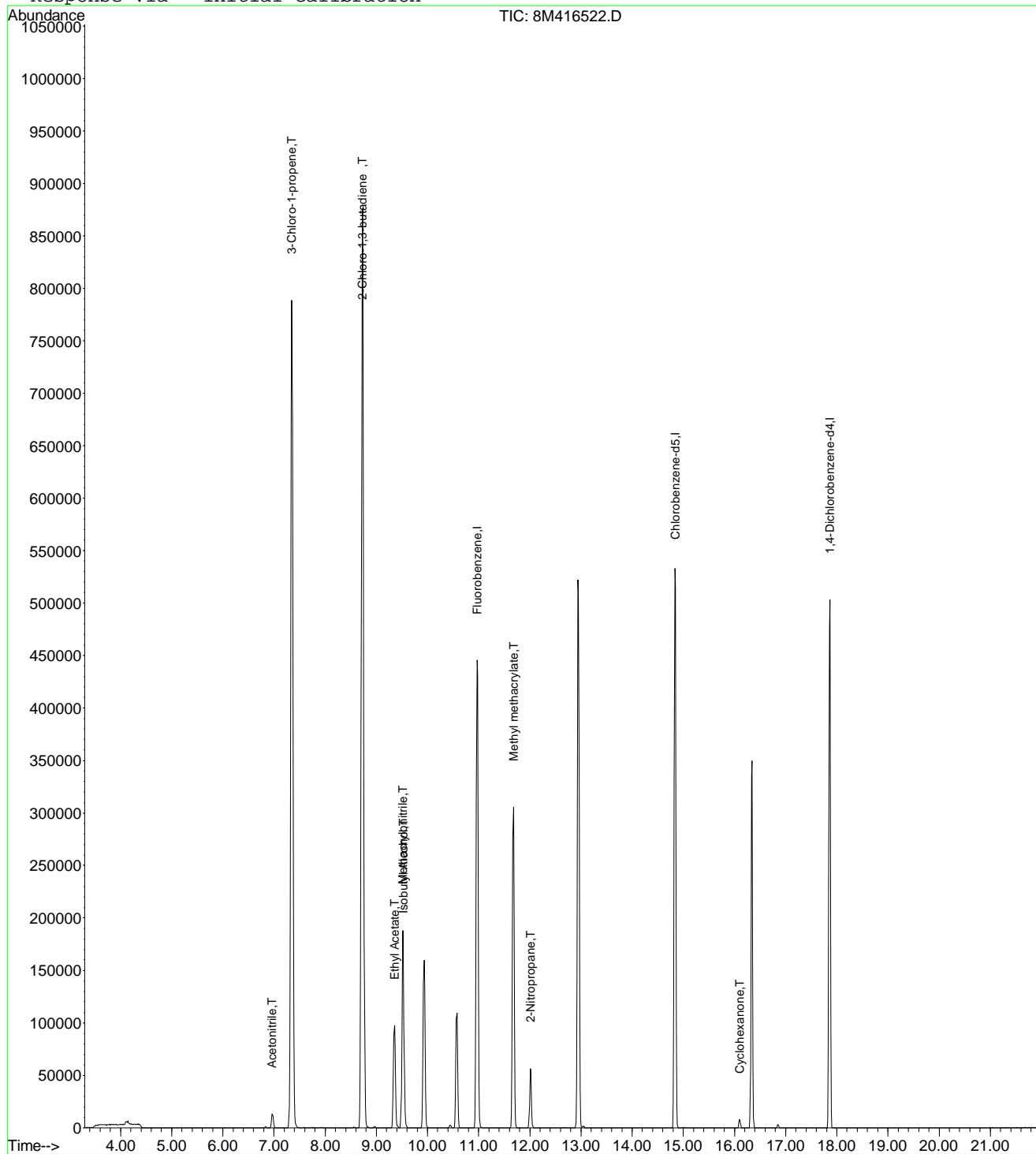
 (#) = qualifier out of range (m) = manual integration
 8M416522.D A9FOOWTR.M Thu Dec 08 14:34:01 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416522.D Vial: 5
 Acq On : 8 Dec 2016 10:47 Operator: TMB
 Sample : WG594051-05 100ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 8 14:33 2016

Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416522.D Vial: 5
 Acq On : 8 Dec 2016 10:47 Operator: TMB
 Sample : WG594051-05 100ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 1% Max. R.T. Dev 0.50min
 Max. RRF Dev : 75% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Acetonitrile	100.0000	104.5933	-4.6	100	0.00
3 T	3-Chloro-1-propene	100.0000	98.2967	1.7	100	0.00
4 T	2-Chloro-1,3-butadiene	100.0000	99.2224	0.8	100	0.00
5 T	Ethyl Acetate	100.0000	98.6828	1.3	100	0.00
6 T	Methacrylonitrile	100.0000	101.4448	-1.4	100	0.00
7 T	Isobutyl Alcohol	200.0000	199.0363	0.5	100	0.00
8 T	1-Butanol	-1.0000	0.0000	0.0	0	0.00
9 T	Methyl methacrylate	100.0000	101.0159	-1.0	100	0.00
10 T	2-Nitropropane	100.0000	95.5410	4.5	100	0.00
11 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
12 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
13 T	Cyclohexanone	100.0000	99.5894	0.4	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M416522.D A9FOOWTR.M Thu Dec 08 14:41:12 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416523.D Vial: 6
 Acq On : 8 Dec 2016 11:16 Operator: TMB
 Sample : WG594051-06 200ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:34:02 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	594977	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	420464	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.85	152	172604	25.00	ug/L	0.00

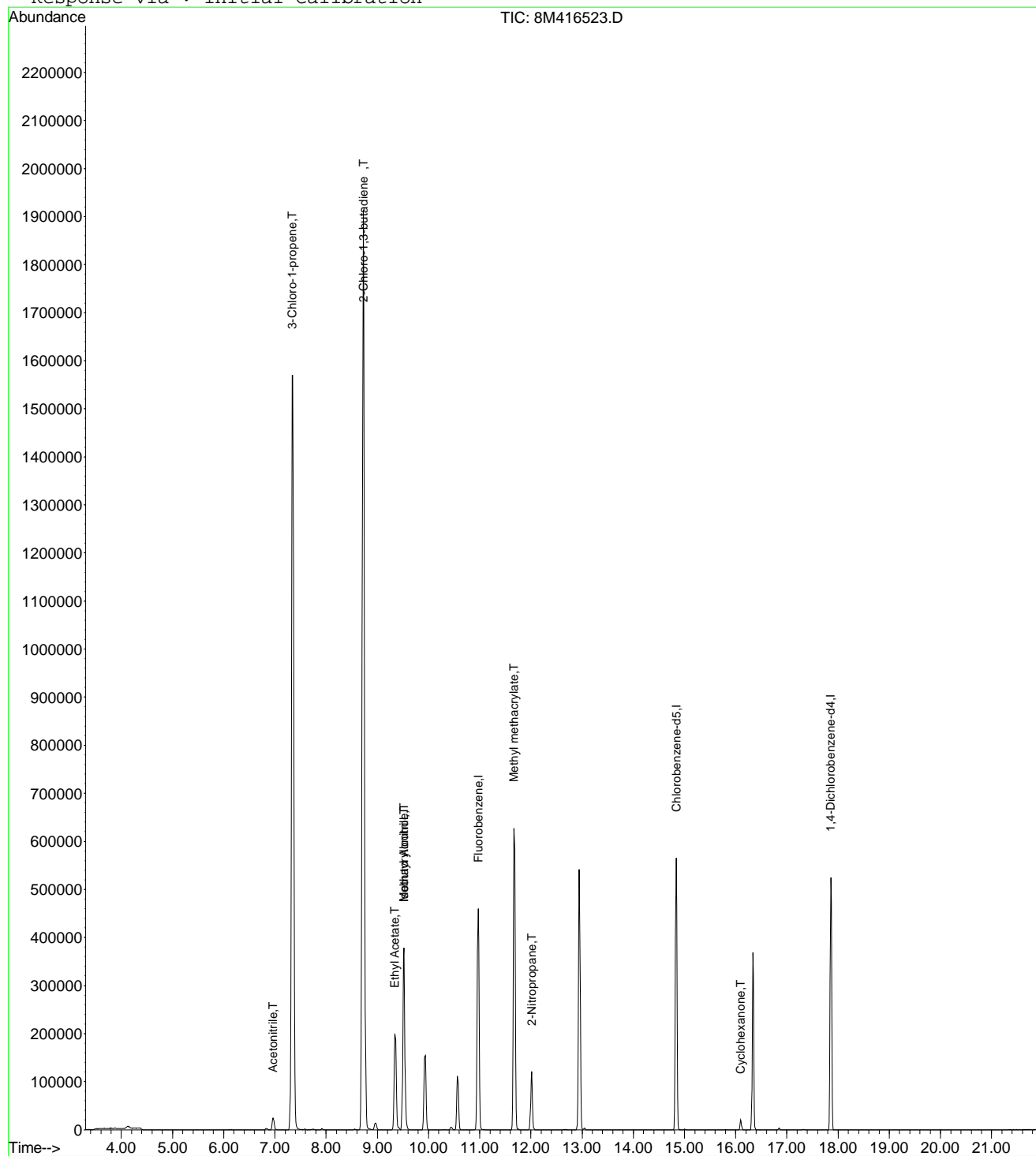
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	34536	201.2600	ug/L	98
3) 3-Chloro-1-propene	7.34	41	1382110	199.7750	ug/L	97
4) 2-Chloro-1,3-butadiene	8.73	53	1548323	204.7683	ug/L	96
5) Ethyl Acetate	9.35	43	311769	201.6892	ug/L	100
6) Methacrylonitrile	9.52	67	209671	208.6271	ug/L	99
7) Isobutyl Alcohol	9.52	43	19754	387.3323	ug/L	94
9) Methyl methacrylate	11.67	41	335849	206.0586	ug/L	99
10) 2-Nitropropane	12.01	43	108018	203.8928	ug/L	98
13) Cyclohexanone	16.10	55	10760	201.7141	ug/L	97

 (#) = qualifier out of range (m) = manual integration
 8M416523.D A9FOOWTR.M Thu Dec 08 14:34:03 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416523.D Vial: 6
Acq On : 8 Dec 2016 11:16 Operator: TMB
Sample : WG594051-06 200ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79185 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 14:34 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416523.D A9FOOWTR.M

Thu Dec 08 14:34:04 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416524.D Vial: 7
 Acq On : 8 Dec 2016 11:46 Operator: TMB
 Sample : WG594051-07 300ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:34:05 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	603930	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	427693	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	174680	25.00	ug/L	0.00

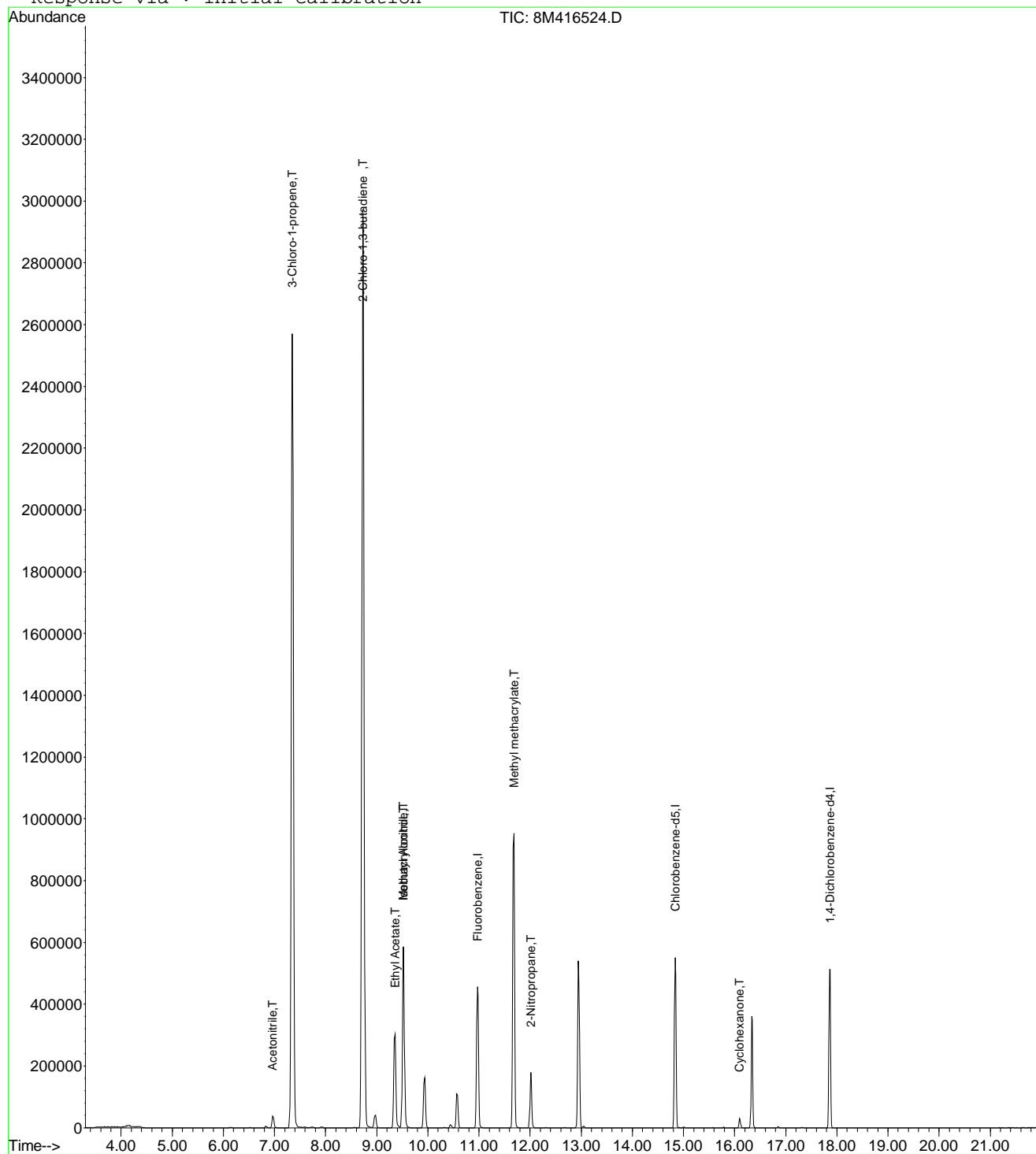
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	50936	292.4312	ug/L	98
3) 3-Chloro-1-propene	7.35	41	2157997	307.3002	ug/L	98
4) 2-Chloro-1,3-butadiene	8.72	53	2431028	316.7413	ug/L	97
5) Ethyl Acetate	9.36	43	465757	296.8402	ug/L	100
6) Methacrylonitrile	9.52	67	317606	311.3398	ug/L	99
7) Isobutyl Alcohol	9.52	43	31446	607.4460	ug/L	97
9) Methyl methacrylate	11.68	41	510372	308.4942	ug/L	99
10) 2-Nitropropane	12.01	43	166198	309.0616	ug/L	100
13) Cyclohexanone	16.10	55	16564	306.8294	ug/L	99

 (#) = qualifier out of range (m) = manual integration
 8M416524.D A9FOOWTR.M Thu Dec 08 14:34:06 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416524.D Vial: 7
Acq On : 8 Dec 2016 11:46 Operator: TMB
Sample : WG594051-07 300ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79185 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 14:34 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416524.D A9FOOWTR.M

Thu Dec 08 14:34:06 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416525.D Vial: 8
 Acq On : 8 Dec 2016 12:16 Operator: TMB
 Sample : WG594051-08 400ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:34:08 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	605694	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.83	117	430760	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	180284	25.00	ug/L	0.00

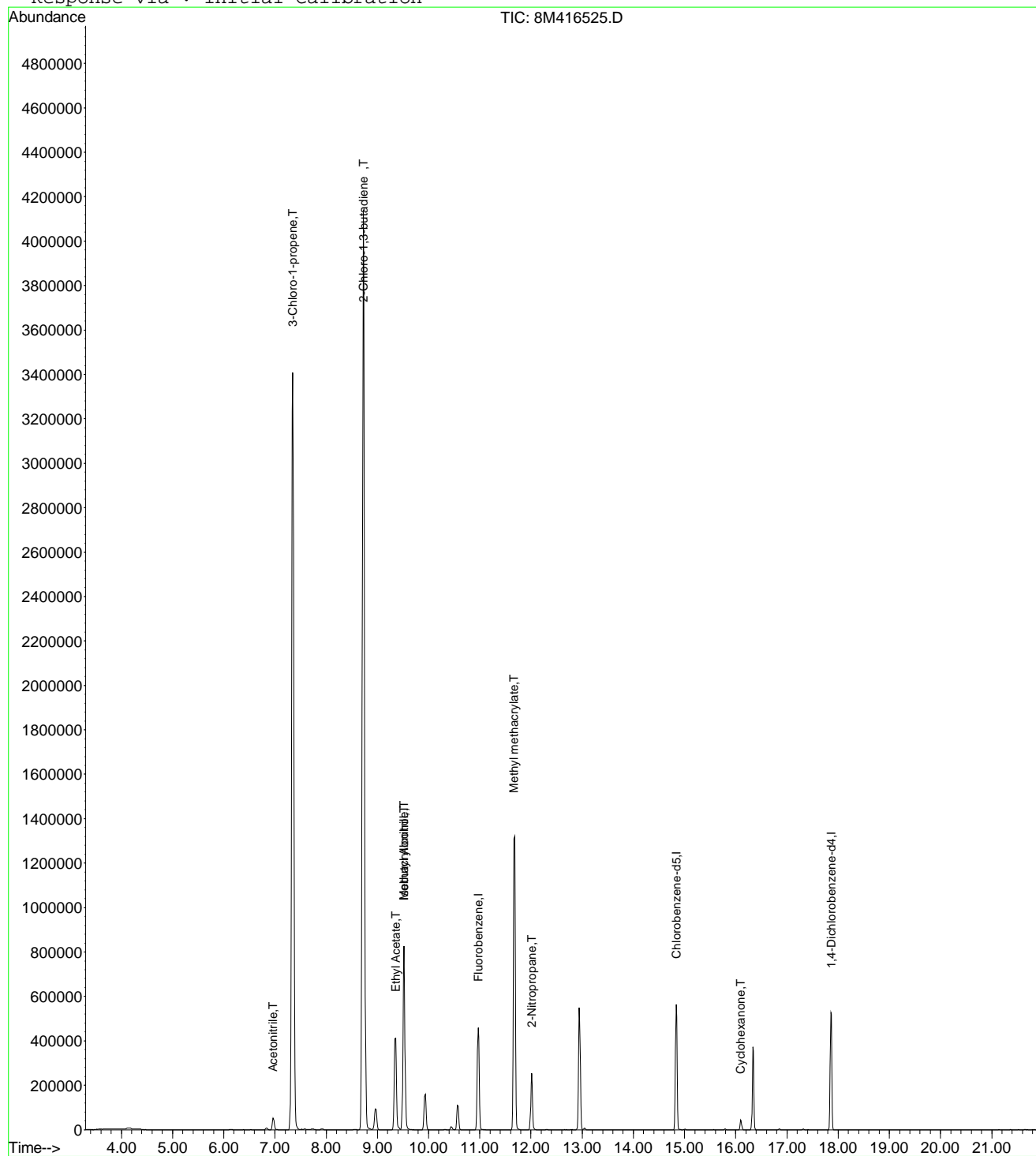
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	71198	407.5680	ug/L	99
3) 3-Chloro-1-propene	7.35	41	2884846	409.6076	ug/L	99
4) 2-Chloro-1,3-butadiene	8.72	53	3270965	424.9364	ug/L	98
5) Ethyl Acetate	9.35	43	647926	411.7391	ug/L	100
6) Methacrylonitrile	9.52	67	444486	434.4476	ug/L	100
7) Isobutyl Alcohol	9.52	43	45941	884.8630	ug/L	99
9) Methyl methacrylate	11.67	41	717453	432.4013	ug/L	100
10) 2-Nitropropane	12.01	43	236171	437.9042	ug/L	98
13) Cyclohexanone	16.10	55	23842	427.9179	ug/L	97

 (#) = qualifier out of range (m) = manual integration
 8M416525.D A9FOOWTR.M Thu Dec 08 14:34:09 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416525.D Vial: 8
Acq On : 8 Dec 2016 12:16 Operator: TMB
Sample : WG594051-08 400ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79185 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 14:34 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416525.D A9FOOWTR.M

Thu Dec 08 14:34:09 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416526.D Vial: 9
 Acq On : 8 Dec 2016 12:45 Operator: TMB
 Sample : WG594051-09 500ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79185 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 14:34:10 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	602709	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	431889	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.86	152	183338	25.00	ug/L	0.00

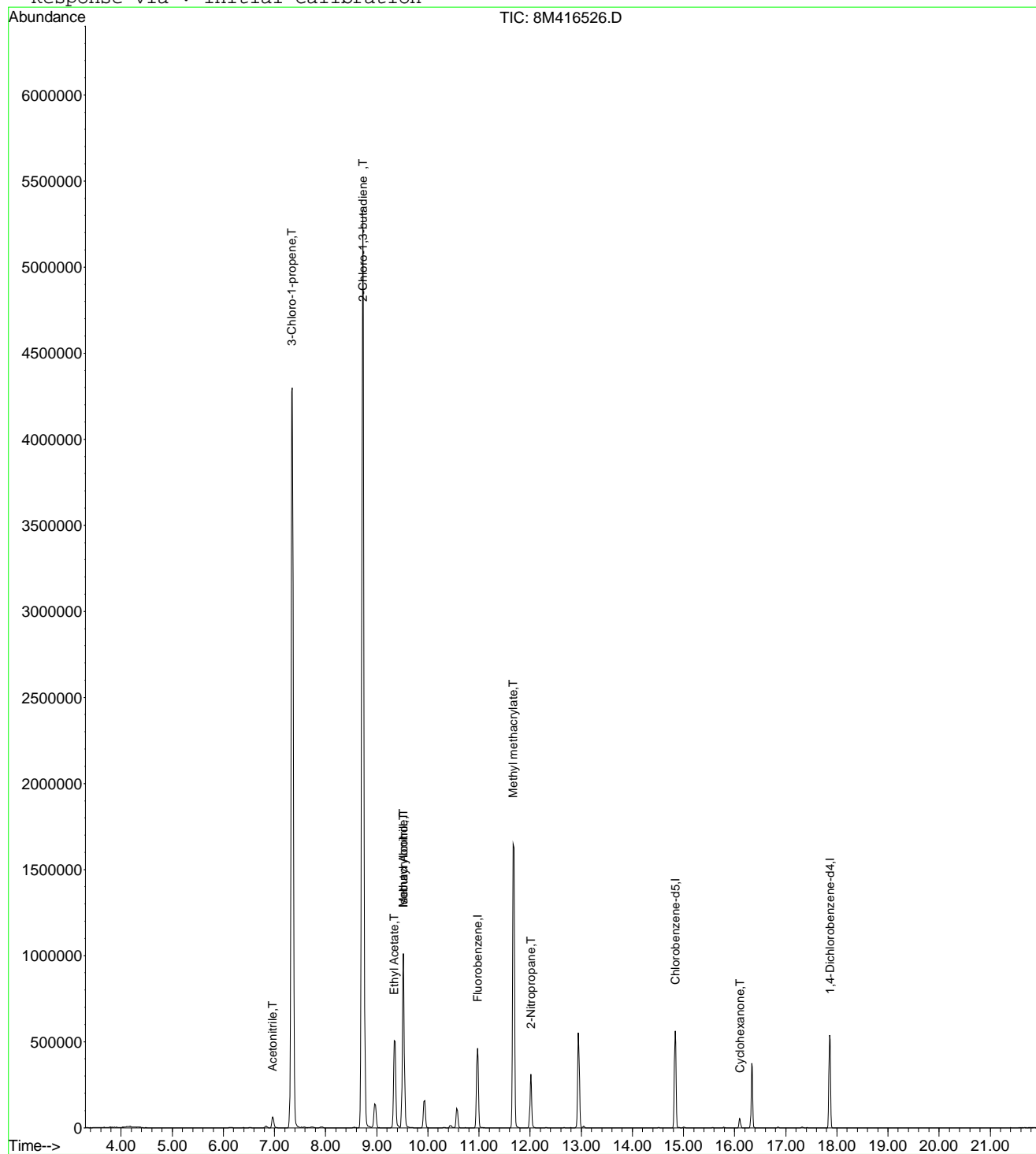
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	85570	492.2655	ug/L	100
3) 3-Chloro-1-propene	7.34	41	3683366	525.5763	ug/L	100
4) 2-Chloro-1,3-butadiene	8.72	53	4138456	540.2962	ug/L	100
5) Ethyl Acetate	9.35	43	797081	509.0316	ug/L	100
6) Methacrylonitrile	9.52	67	547652	537.9348	ug/L	100
7) Isobutyl Alcohol	9.52	43	51546	997.7372	ug/L	100
9) Methyl methacrylate	11.67	41	892736	540.7072	ug/L	100
10) 2-Nitropropane	12.01	43	285485	531.9631	ug/L	100
13) Cyclohexanone	16.11	55	29810	526.1195	ug/L	100

 (#) = qualifier out of range (m) = manual integration
 8M416526.D A9FOOWTR.M Thu Dec 08 14:34:12 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416526.D Vial: 9
Acq On : 8 Dec 2016 12:45 Operator: TMB
Sample : WG594051-09 500ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79185 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 14:34 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416526.D A9FOOWTR.M

Thu Dec 08 14:34:12 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416529.D Vial: 12
 Acq On : 8 Dec 2016 14:12 Operator: TMB
 Sample : WG594051-09 100ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79186 Multiplr: 1.00
 MS Integration Params: rteint.p
 Quant Time: Dec 08 15:03:45 2016 Quant Results File: A9FOOWTR.RES

Quant Method : K:\ORGANICS\V...\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.97	96	587664	25.00	ug/L	0.00
11) Chlorobenzene-d5	14.84	117	419667	25.00	ug/L	0.00
12) 1,4-Dichlorobenzene-d4	17.87	152	172171	25.00	ug/L	0.00

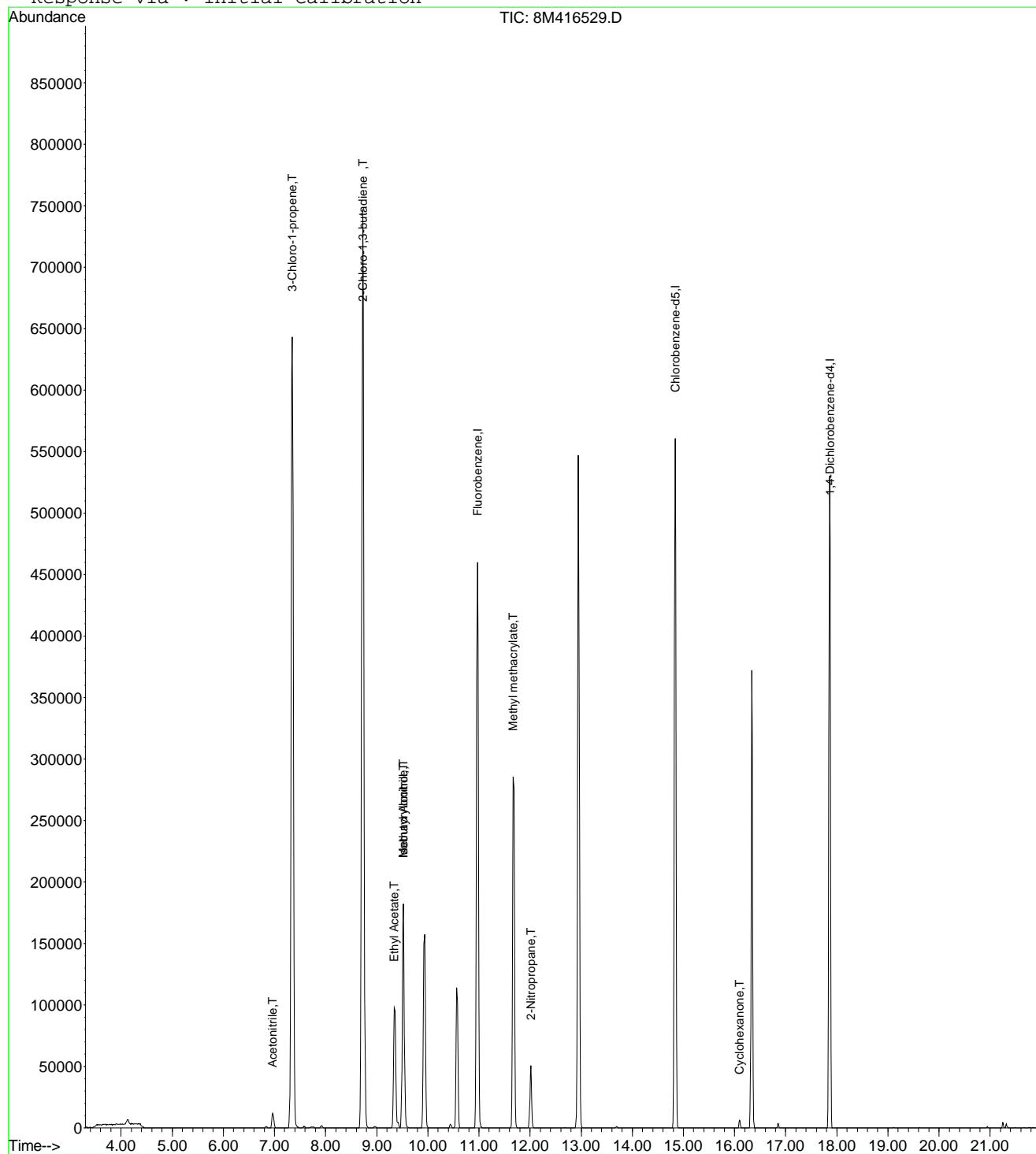
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Acetonitrile	6.97	41	16063	94.7727	ug/L	97
3) 3-Chloro-1-propene	7.35	41	567885	83.1055	ug/L	96
4) 2-Chloro-1,3-butadiene	8.73	53	618003	82.7490	ug/L	94
5) Ethyl Acetate	9.35	43	154055	100.9013	ug/L	99
6) Methacrylonitrile	9.52	67	99886	100.6255	ug/L	98
7) Isobutyl Alcohol	9.52	43	9727	193.0984	ug/L	95
9) Methyl methacrylate	11.67	41	157038	97.5489	ug/L	98
10) 2-Nitropropane	12.01	43	46163	88.2208	ug/L	98
13) Cyclohexanone	16.10	55	3773	70.9091	ug/L	99

 (#) = qualifier out of range (m) = manual integration
 8M416529.D A9FOOWTR.M Thu Dec 08 15:03:47 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416529.D Vial: 12
Acq On : 8 Dec 2016 14:12 Operator: TMB
Sample : WG594051-09 100ug/L STD A9/FOO Inst : HPMS8
Misc : 1,1 STD79186 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Dec 8 15:03 2016 Quant Results File: A9FOOWTR.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
Last Update : Thu Dec 08 13:41:47 2016
Response via : Initial Calibration



8M416529.D A9FOOWTR.M

Thu Dec 08 15:03:47 2016

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416529.D Vial: 12
 Acq On : 8 Dec 2016 14:12 Operator: TMB
 Sample : WG594051-09 100ug/L STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD79186 Multiplr: 1.00
 MS Integration Params: rteint.p

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8
 Last Update : Thu Dec 08 13:41:47 2016
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 1% Max. R.T. Dev 0.50min
 Max. RRF Dev : 75% Max. Rel. Area : 200%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	99	0.00
2 T	Acetonitrile	100.0000	94.7727	5.2	90	0.00
3 T	3-Chloro-1-propene	100.0000	83.1055	16.9	84	0.01
4 T	2-Chloro-1,3-butadiene	100.0000	82.7490	17.3	83	0.00
5 T	Ethyl Acetate	100.0000	100.9013	-0.9	102	0.00
6 T	Methacrylonitrile	100.0000	100.6255	-0.6	99	0.00
7 T	Isobutyl Alcohol	200.0000	193.0984	3.5	96	0.00
8 T	1-Butanol	-1.0000	0.0000	0.0	0	0.00
9 T	Methyl methacrylate	100.0000	97.5489	2.5	96	0.00
10 T	2-Nitropropane	100.0000	88.2208	11.8	92	0.00
11 I	Chlorobenzene-d5	25.0000	25.0000	0.0	101	0.00
12 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	102	0.00
13 T	Cyclohexanone	100.0000	70.9091	29.1	73	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M416529.D A9FOOWTR.M Thu Dec 08 15:03:52 2016

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418134.D Vial: 3
 Acq On : 3 Mar 2017 9:51 Operator: TMB
 Sample : WG604846-03 0.4ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:17 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	630116	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.83	117	473450	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.87	152	247226	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	0.00	111	0	0.0000	ug/L	
Spiked Amount	25.000	Range 86 - 118	Recovery	=	0.00%#	
43) 1,2-Dichloroethane-d4	0.00	65	0	0.0000	ug/L	
Spiked Amount	25.000	Range 80 - 120	Recovery	=	0.00%#	
58) Toluene-d8	12.94	98	387	0.0174	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	0.08%#	
80) p-Bromofluorobenzene	0.00	95	0	0.0000	ug/L	
Spiked Amount	25.000	Range 86 - 115	Recovery	=	0.00%#	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.35	85	3153	0.3738	ug/L	88
3) Chloromethane	3.83	50	6179	0.5174	ug/L	85
4) Vinyl Chloride	4.07	62	4425	0.4247	ug/L	92
5) 1,3-Butadiene	4.13	54	3123	Below Cal		80
6) Bromomethane	4.98	94	1072	0.7917	ug/L	74
7) Chloroethane	5.13	64	1304	0.2931	ug/L	# 45
8) Trichlorofluoromethane	5.62	101	3973	0.3689	ug/L	# 87
10) Isoprene	6.18	67	3357	0.3482	ug/L	77
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	1426	0.2272	ug/L	66
14) 1,1-Dichloroethene	6.71	61	3956	0.4113	ug/L	83
16) Dimethyl Sulfide	6.97	62	2439	0.3417	ug/L	88
19) Methylene Chloride	7.49	84	2885	0.4326	ug/L	89
20) Carbon Disulfide	7.54	76	8728	0.4254	ug/L	# 88
22) Methyl Tert Butyl Ether	7.72	73	4482	0.3618	ug/L	# 53
23) trans-1,2-Dichloroethene	7.94	61	3731	0.4023	ug/L	99
24) n-Hexane	8.03	57	3905	0.4393	ug/L	84
26) Vinyl Acetate	8.53	43	2278	0.3209	ug/L	# 73
27) 1,1-Dichloroethane	8.56	63	4410	0.3765	ug/L	# 88
31) 2,2-Dichloropropane	9.34	77	4074	0.4104	ug/L	80
32) cis-1,2-Dichloroethene	9.41	96	2521	0.3482	ug/L	89
33) Chloroform	9.62	83	5579	0.4541	ug/L	93
35) Bromochloromethane	9.86	130	1380	0.3500	ug/L	87
38) 1,1,1-Trichloroethane	10.15	97	3772	0.3626	ug/L	92
39) Cyclohexane	10.19	56	3957	0.3591	ug/L	# 89
40) 1,1-Dichloropropene	10.34	75	3115	0.3517	ug/L	83
42) Carbon Tetrachloride	10.50	117	3492	0.3653	ug/L	# 90
45) 1,2-Dichloroethane	10.66	62	2765	0.3737	ug/L	# 75
46) Benzene	10.70	78	10224	0.4002	ug/L	88
47) Trichloroethene	11.46	130	2867	0.3870	ug/L	94
48) Methylcyclohexane	11.53	83	4143	0.3745	ug/L	93
49) 1,2-Dichloropropane	11.67	63	2061	0.3221	ug/L	89
50) Bromodichloromethane	11.98	83	3133	0.3711	ug/L	# 90
52) Dibromomethane	12.06	93	1135	0.3537	ug/L	91
53) 2-Chloroethyl Vinyl Ether	12.25	63	516	0.1808	ug/L	# 47
55) cis-1,3-Dichloropropene	12.61	75	3599	0.3709	ug/L	94
56) Dimethyl Disulfide	12.88	79	1247	0.2355	ug/L	98
59) Toluene	13.03	91	10048	0.3770	ug/L	98
60) Ethyl Methacrylate	13.12	69	1337	0.7903	ug/L	# 55
62) trans-1,3-Dichloropropene	13.21	75	2531	0.3177	ug/L	82
63) 1,1,2-Trichloroethane	13.43	97	1530	0.3507	ug/L	100

(#) = qualifier out of range (m) = manual integration
 8M418134.D 8260WT.M Mon Mar 06 12:10:20 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418134.D Vial: 3
 Acq On : 3 Mar 2017 9:51 Operator: TMB
 Sample : WG604846-03 0.4ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:17 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

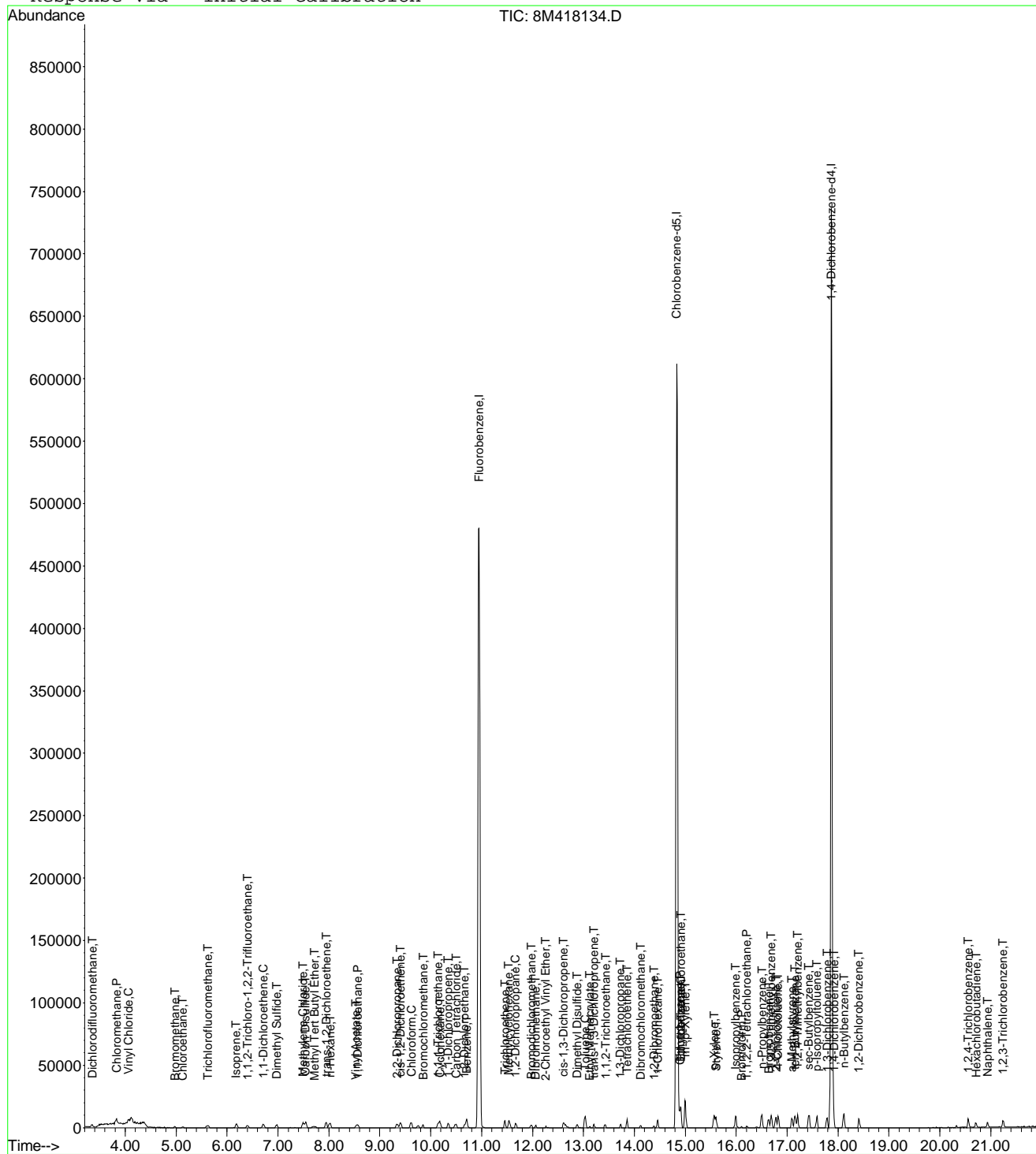
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
65) 1,3-Dichloropropane	13.72	76	2445	0.3306	ug/L	94
66) Tetrachloroethene	13.86	164	2213	0.3853	ug/L	88
67) Dibromochloromethane	14.13	129	1897	0.3332	ug/L	95
68) 1,2-Dibromoethane	14.38	107	1408	0.3294	ug/L	99
69) 1-Chlorohexane	14.46	91	3296	0.3560	ug/L	96
70) Chlorobenzene	14.89	112	7536	0.3896	ug/L	84
71) 1,1,1,2-Tetrachloroethane	14.91	131	2203	0.3174	ug/L	93
72) Ethylbenzene	14.91	106	4035	0.3696	ug/L	94
73) m-,p-Xylene	15.01	106	9254	0.7398	ug/L	86
74) o-Xylene	15.56	106	4134	0.3301	ug/L	93
75) Styrene	15.60	104	6728	0.3415	ug/L	93
76) Bromoform	16.10	173	819	0.7771	ug/L #	45
77) Isopropylbenzene	15.99	105	11701	0.3815	ug/L	93
79) 1,1,2,2-Tetrachloroethane	16.20	83	1407	0.3069	ug/L #	88
83) n-Propylbenzene	16.50	91	14450	0.4084	ug/L	95
84) Bromobenzene	16.64	156	2748	0.3575	ug/L	92
85) 1,3,5-Trimethylbenzene	16.69	105	9612	0.3795	ug/L	96
86) 2-Chlorotoluene	16.78	91	9551	0.4002	ug/L	99
87) 4-Chlorotoluene	16.82	91	7564	0.3632	ug/L	92
88) a-Methylstyrene	17.09	118	3924	0.2665	ug/L	96
89) tert-Butylbenzene	17.16	134	2222	0.3803	ug/L	89
90) 1,2,4-Trimethylbenzene	17.21	105	9769	0.3707	ug/L	84
91) sec-Butylbenzene	17.42	105	12801	0.3919	ug/L	99
92) p-Isopropyltoluene	17.58	119	10812	0.3943	ug/L	95
93) 1,3-Dichlorobenzene	17.79	146	5969	0.3844	ug/L	92
94) 1,4-Dichlorobenzene	17.92	146	6288	0.4076	ug/L #	34
95) n-Butylbenzene	18.12	91	10810	0.4098	ug/L	96
96) 1,2-Dichlorobenzene	18.41	146	5384	0.3915	ug/L	89
98) 1,2,4-Trichlorobenzene	20.56	180	3845	0.3835	ug/L	94
99) Hexachlorobutadiene	20.71	225	1695	0.3599	ug/L	96
100) Naphthalene	20.94	128	5947	0.3782	ug/L	89
101) 1,2,3-Trichlorobenzene	21.24	180	2781	0.3353	ug/L	87

(#) = qualifier out of range (m) = manual integration
 8M418134.D 8260WT.M Mon Mar 06 12:10:21 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418134.D Vial: 3
Acq On : 3 Mar 2017 9:51 Operator: TMB
Sample : WG604846-03 0.4ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418134.D Vial: 3
 Acq On : 3 Mar 2017 9:51 Operator: TMB
 Sample : WG604846-03 0.4ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Dichlorodifluoromethane	-1.0000	0.3738	0.0	100	0.01
3 P	Chloromethane	-1.0000	0.5174	0.0	100	0.01
4 C	Vinyl Chloride	0.4000	0.4247	-6.2	100	0.01
5 T	1,3-Butadiene	-1.0000	-1.0000	0.0	0	0.04
6 T	Bromomethane	-1.0000	0.7917	0.0	0	0.01
7 T	Chloroethane	0.4000	0.2931	26.7#	100	0.00
8 T	Trichlorofluoromethane	0.4000	0.3689	7.8	100	0.00
9 T	Diethyl ether	-1.0000	0.0000	0.0	0	-6.14#
10 T	Isoprene	-1.0000	0.3482	0.0	100	0.00
11 T	Acrolein	-1.0000	0.0000	0.0	0	-6.38#
12 T	1,1,2-Trichloro-1,2,2-Trifl	-1.0000	0.2272	0.0	100	0.01
13 T	Acetone	-1.0000	0.0000	0.0	0	-6.48#
14 C	1,1-Dichloroethene	0.4000	0.4113	-2.8	100	0.00
15 T	Tert-Butyl Alcohol	-1.0000	0.0000	0.0	0	-6.82#
16 T	Dimethyl Sulfide	-1.0000	0.3417	0.0	100	0.00
17 T	Iodomethane	-1.0000	0.0000	0.0	0	-7.22#
18 T	Methyl acetate	-1.0000	0.0000	0.0	0	-7.24#
19 T	Methylene Chloride	-1.0000	0.4326	0.0	100	0.00
20 T	Carbon Disulfide	-1.0000	0.4254	0.0	100	0.00
21 T	Acrylonitrile	-1.0000	0.0000	0.0	0	-7.67#
22 T	Methyl Tert Butyl Ether	-1.0000	0.3618	0.0	100	0.01
23 T	trans-1,2-Dichloroethene	0.4000	0.4023	-0.6	100	0.00
24 T	n-Hexane	-1.0000	0.4393	0.0	100	0.01
25 T	Diisopropyl ether	-1.0000	0.0000	0.0	0	-8.35#
26 T	Vinyl Acetate	-1.0000	0.3209	0.0	100	0.00
27 P	1,1-Dichloroethane	0.4000	0.3765	5.9	100	0.00
28 T	Ethyl-Tert-Butyl ether	-1.0000	0.0000	0.0	0	-8.93#
29 T	2-Butanone	-1.0000	0.0000	0.0	0	-9.12#
30 T	Propionitrile	-1.0000	0.0000	0.0	0	-9.23#
31 T	2,2-Dichloropropane	0.4000	0.4104	-2.6	100	0.00
32 T	cis-1,2-Dichloroethene	0.4000	0.3482	13.0	100	0.00
33 C	Chloroform	0.4000	0.4541	-13.5	100	0.00
34	1-Bromopropane	-1.0000	0.0000	0.0	0	-9.75#
35 T	Bromochloromethane	0.4000	0.3500	12.5	100	0.00
36 T	Tetrahydrofuran	-1.0000	0.0000	0.0	0	-9.87#
37 S	Dibromofluoromethane	-1.0000	0.0000	0.0	0	-9.90#
38 T	1,1,1-Trichloroethane	0.4000	0.3626	9.4	100	0.00
39 T	Cyclohexane	-1.0000	0.3591	0.0	100	0.01
40 T	1,1-Dichloropropene	-1.0000	0.3517	0.0	100	0.00
41 T	Tert-Amyl-Methyl ether	-1.0000	0.0000	0.0	0	-10.44#
42 T	Carbon Tetrachloride	0.4000	0.3653	8.7	100	0.00
43 S	1,2-Dichloroethane-d4	-1.0000	0.0000	0.0	0	-10.54#
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	0.4000	0.3736	6.6	100	0.00
46 T	Benzene	0.4000	0.4002	-0.0	100	0.00
47 T	Trichloroethene	0.4000	0.3870	3.2	100	0.00
48 T	Methylcyclohexane	-1.0000	0.3745	0.0	100	0.00
49 C	1,2-Dichloropropane	0.4000	0.3221	19.5	100	0.00
50 T	Bromodichloromethane	0.4000	0.3711	7.2	100	0.00
51 T	1,4-Dioxane	-1.0000	0.0000	0.0	0	-11.96#
52 T	Dibromomethane	0.4000	0.3537	11.6	100	0.00
53 T	2-Chloroethyl Vinyl Ether	-1.0000	0.1808	0.0	0	0.00
54 T	4-Methyl-2-Pentanone	-1.0000	0.0000	0.0	0	-12.29#

(#) = Out of Range

8M418134.D 8260WT.M

Mon Mar 06 12:12:40 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418134.D Vial: 3
 Acq On : 3 Mar 2017 9:51 Operator: TMB
 Sample : WG604846-03 0.4ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	0.4000	0.3709	7.3	100	0.00
56 T	Dimethyl Disulfide	-1.0000	0.2355	0.0	100	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
58 S	Toluene-d8	-1.0000	0.0174	0.0	100	0.00
59 C	Toluene	0.4000	0.3770	5.8	100	0.00
60 T	Ethyl Methacrylate	-1.0000	0.7903	0.0	0	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	-1.0000	0.3177	0.0	100	0.00
63 T	1,1,2-Trichloroethane	0.4000	0.3507	12.3	100	0.00
64 T	2-Hexanone	-1.0000	0.0000	0.0	0	-13.36#
65 T	1,3-Dichloropropane	0.4000	0.3306	17.4	100	0.00
66 T	Tetrachloroethene	0.4000	0.3853	3.7	100	0.00
67 T	Dibromochloromethane	0.4000	0.3332	16.7	100	0.00
68 T	1,2-Dibromoethane	0.4000	0.3294	17.7	100	0.00
69 T	1-Chlorohexane	0.4000	0.3560	11.0	100	0.00
70 P	Chlorobenzene	0.4000	0.3896	2.6	100	0.00
71 T	1,1,1,2-Tetrachloroethane	0.4000	0.3175	20.6	100	0.00
72 C	Ethylbenzene	0.4000	0.3696	7.6	100	0.00
73 T	m-,p-Xylene	0.8000	0.7398	7.5	100	0.00
74 T	o-Xylene	-1.0000	0.3301	0.0	100	0.00
75 T	Styrene	0.4000	0.3415	14.6	100	0.00
76 P	Bromoform	-1.0000	0.7771	0.0	0	0.00
77 T	Isopropylbenzene	0.4000	0.3815	4.6	100	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
79 P	1,1,2,2-Tetrachloroethane	0.4000	0.3069	23.3	100	0.00
80 S	p-Bromofluorobenzene	-1.0000	0.0000	0.0	0	-16.35#
81 T	1,2,3-Trichloropropane	-1.0000	0.0000	0.0	0	-16.41#
82 T	trans-1,4-Dichloro-2-Butene	-1.0000	0.0000	0.0	0	-16.45#
83 T	n-Propylbenzene	0.4000	0.4084	-2.1	100	0.00
84 T	Bromobenzene	0.4000	0.3575	10.6	100	0.00
85 T	1,3,5-Trimethylbenzene	0.4000	0.3795	5.1	100	0.00
86 T	2-Chlorotoluene	0.4000	0.4002	-0.0	100	0.00
87 T	4-Chlorotoluene	0.4000	0.3632	9.2	100	0.00
88 T	a-Methylstyrene	-1.0000	0.2665	0.0	100	0.00
89 T	tert-Butylbenzene	-1.0000	0.3803	0.0	100	0.00
90 T	1,2,4-Trimethylbenzene	0.4000	0.3707	7.3	100	0.00
91 T	sec-Butylbenzene	-1.0000	0.3919	0.0	100	0.00
92 T	p-Isopropyltoluene	-1.0000	0.3943	0.0	100	0.00
93 T	1,3-Dichlorobenzene	0.4000	0.3844	3.9	100	0.00
94 T	1,4-Dichlorobenzene	0.4000	0.4076	-1.9	100	0.00
95 T	n-Butylbenzene	-1.0000	0.4098	0.0	100	0.00
96 T	1,2-Dichlorobenzene	0.4000	0.3915	2.1	100	0.00
97 T	1,2-Dibromo-3-Chloropropane	-1.0000	0.0000	0.0	0	-19.41#
98 T	1,2,4-Trichlorobenzene	0.4000	0.3835	4.1	100	0.00
99 T	Hexachlorobutadiene	0.4000	0.3599	10.0	100	0.00
100 T	Naphthalene	0.4000	0.3782	5.5	100	0.00
101 T	1,2,3-Trichlorobenzene	0.4000	0.3353	16.2	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418134.D 8260WT.M Mon Mar 06 12:12:40 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418135.D Vial: 4
 Acq On : 3 Mar 2017 10:20 Operator: TMB
 Sample : WG604846-04 lug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:22 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	622067	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	469373	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	245858	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.90	111	2820	0.4414	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	1.76%#	
43) 1,2-Dichloroethane-d4	10.55	65	2477	0.4424	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	1.76%#	
58) Toluene-d8	12.93	98	11093	0.5025	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	2.00%#	
80) p-Bromofluorobenzene	16.35	95	4482	0.5267	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	2.12%#	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.35	85	7586	0.9109	ug/L	94
3) Chloromethane	3.82	50	13940	1.1823	ug/L	90
4) Vinyl Chloride	4.06	62	12325	1.1983	ug/L	98
5) 1,3-Butadiene	4.12	54	7849	Below Cal		85
6) Bromomethane	4.96	94	3442	1.2712	ug/L	96
7) Chloroethane	5.13	64	4530	1.0314	ug/L	83
8) Trichlorofluoromethane	5.61	101	10956	1.0304	ug/L	# 96
9) Diethyl ether	6.14	59	19691	4.7666	ug/L	96
10) Isoprene	6.17	67	8078	0.8488	ug/L	96
11) Acrolein	6.38	56	1082	1.9462	ug/L	74
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	5684	0.9174	ug/L	91
14) 1,1-Dichloroethene	6.71	61	9461	0.9964	ug/L	95
15) Tert-Butyl Alcohol	6.82	59	1834	7.2085	ug/L	# 61
16) Dimethyl Sulfide	6.97	62	6143	0.8718	ug/L	95
17) Iodomethane	7.23	142	1465	1.5811	ug/L	# 55
18) Methyl acetate	7.24	43	2121	0.8951	ug/L	# 60
19) Methylene Chloride	7.49	84	6505	0.9879	ug/L	97
20) Carbon Disulfide	7.54	76	20039	0.9893	ug/L	98
21) Acrylonitrile	7.67	53	2272	1.9485	ug/L	87
22) Methyl Tert Butyl Ether	7.69	73	11164	0.9129	ug/L	87
23) trans-1,2-Dichloroethene	7.94	61	9164	1.0010	ug/L	93
24) n-Hexane	8.01	57	8481	0.9664	ug/L	98
25) Diisopropyl ether	8.35	45	90889	4.8691	ug/L	97
26) Vinyl Acetate	8.53	43	5962	0.8507	ug/L	# 73
27) 1,1-Dichloroethane	8.56	63	11030	0.9540	ug/L	98
28) Ethyl-Tert-Butyl ether	8.93	59	82512	4.8043	ug/L	99
29) 2-Butanone	9.13	43	950	0.7270	ug/L	# 50
30) Propionitrile	9.23	54	1713	4.1109	ug/L	# 56
31) 2,2-Dichloropropane	9.35	77	9950	1.0153	ug/L	99
32) cis-1,2-Dichloroethene	9.41	96	6609	0.9246	ug/L	95
33) Chloroform	9.61	83	12524	1.0325	ug/L	99
34) 1-Bromopropane	9.75	122	1130	0.8140	ug/L	82
35) Bromochloromethane	9.85	130	3762	0.9665	ug/L	95
36) Tetrahydrofuran	9.87	42	4147	5.0010	ug/L	97
38) 1,1,1-Trichloroethane	10.15	97	10238	0.9969	ug/L	92
39) Cyclohexane	10.18	56	10936	1.0052	ug/L	93
40) 1,1-Dichloropropene	10.34	75	8253	0.9437	ug/L	98
41) Tert-Amyl-Methyl ether	10.44	73	66043	4.6356	ug/L	100
42) Carbon Tetrachloride	10.49	117	9199	0.9747	ug/L	92
45) 1,2-Dichloroethane	10.66	62	7022	0.9612	ug/L	88

(#) = qualifier out of range (m) = manual integration
 8M418135.D 8260WT.M Mon Mar 06 12:10:24 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418135.D Vial: 4
 Acq On : 3 Mar 2017 10:20 Operator: TMB
 Sample : WG604846-04 lug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:22 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

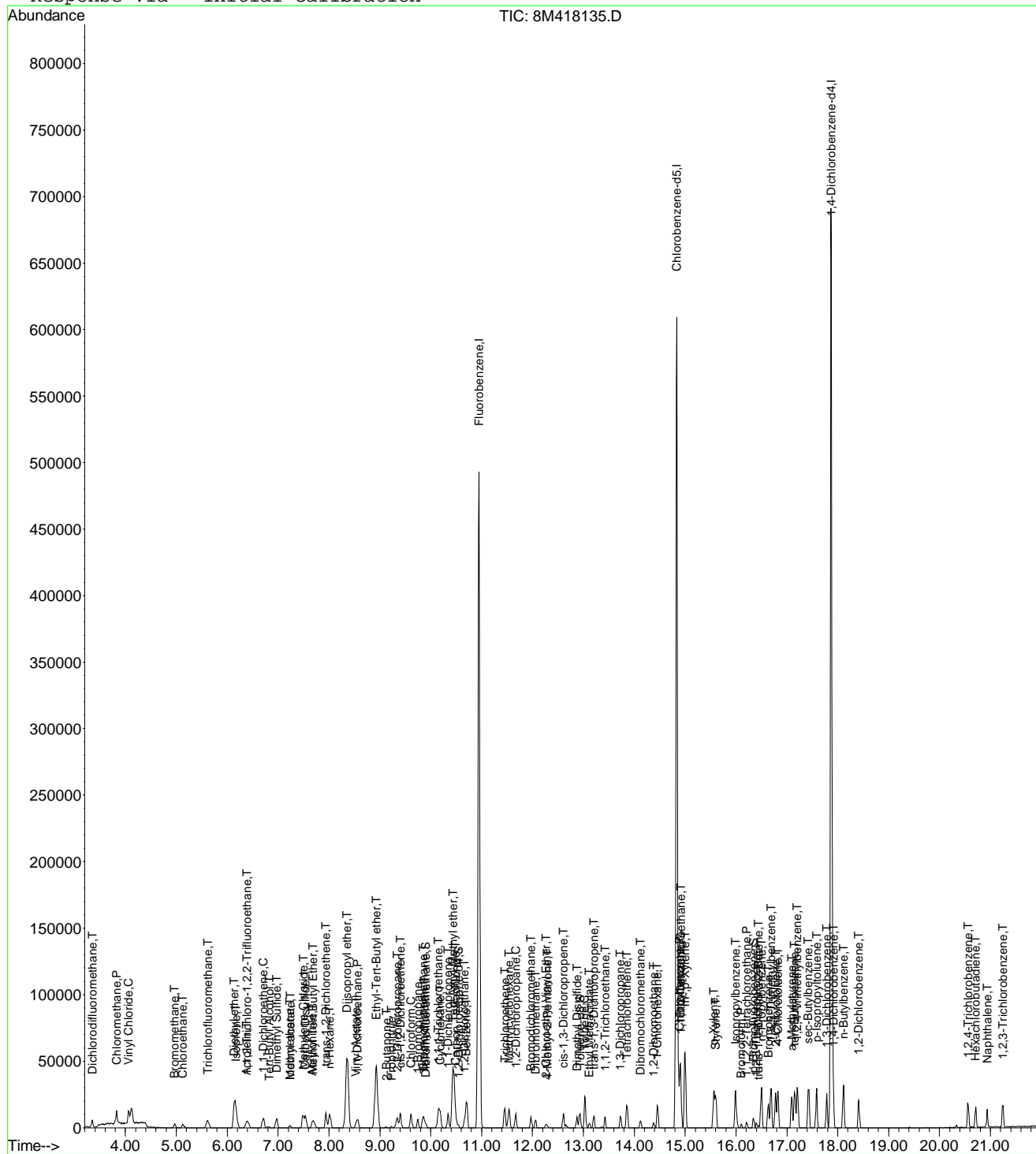
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
46) Benzene	10.70	78	25453	1.0092	ug/L	96
47) Trichloroethene	11.45	130	7295	0.9975	ug/L	97
48) Methylcyclohexane	11.54	83	10640	0.9744	ug/L	93
49) 1,2-Dichloropropane	11.67	63	6326	1.0014	ug/L	87
50) Bromodichloromethane	11.97	83	7792	0.9348	ug/L	95
52) Dibromomethane	12.05	93	2753	0.8690	ug/L	93
53) 2-Chloroethyl Vinyl Ether	12.26	63	2011	0.7136	ug/L #	47
54) 4-Methyl-2-Pentanone	12.29	58	249	0.1988	ug/L #	33
55) cis-1,3-Dichloropropene	12.60	75	8671	0.9051	ug/L	95
56) Dimethyl Disulfide	12.87	79	2898	0.5545	ug/L	83
59) Toluene	13.03	91	27488	1.0402	ug/L	97
60) Ethyl Methacrylate	13.12	69	3438	1.1569	ug/L	91
62) trans-1,3-Dichloropropene	13.20	75	6615	0.8374	ug/L	95
63) 1,1,2-Trichloroethane	13.43	97	4053	0.9372	ug/L	99
65) 1,3-Dichloropropane	13.73	76	7119	0.9709	ug/L	93
66) Tetrachloroethene	13.85	164	5676	0.9967	ug/L	95
67) Dibromochloromethane	14.12	129	4785	0.8477	ug/L	97
68) 1,2-Dibromoethane	14.38	107	3529	0.8327	ug/L	90
69) 1-Chlorohexane	14.45	91	8857	0.9650	ug/L	99
70) Chlorobenzene	14.89	112	19111	0.9967	ug/L	89
71) 1,1,1,2-Tetrachloroethane	14.92	131	5913	0.8595	ug/L	99
72) Ethylbenzene	14.91	106	9827	0.9079	ug/L	96
73) m-,p-Xylene	15.00	106	23779	1.9176	ug/L	92
74) o-Xylene	15.56	106	11257	0.9067	ug/L	94
75) Styrene	15.60	104	16732	0.8567	ug/L	95
76) Bromoform	16.10	173	2256	1.1594	ug/L	98
77) Isopropylbenzene	15.99	105	30889	1.0157	ug/L	93
79) 1,1,2,2-Tetrachloroethane	16.21	83	4097	0.8987	ug/L #	95
81) 1,2,3-Trichloropropane	16.40	110	1107	0.8363	ug/L #	73
82) trans-1,4-Dichloro-2-Butene	16.44	53	512	0.9931	ug/L #	1
83) n-Propylbenzene	16.50	91	37240	1.0584	ug/L	97
84) Bromobenzene	16.64	156	7487	0.9793	ug/L	96
85) 1,3,5-Trimethylbenzene	16.69	105	24762	0.9832	ug/L	99
86) 2-Chlorotoluene	16.78	91	24204	1.0197	ug/L	97
87) 4-Chlorotoluene	16.82	91	20936	1.0110	ug/L	99
88) a-Methylstyrene	17.09	118	10974	0.7494	ug/L	99
89) tert-Butylbenzene	17.15	134	5155	0.8871	ug/L	91
90) 1,2,4-Trimethylbenzene	17.20	105	26296	1.0034	ug/L	98
91) sec-Butylbenzene	17.42	105	33402	1.0282	ug/L	98
92) p-Isopropyltoluene	17.59	119	26478	0.9711	ug/L	98
93) 1,3-Dichlorobenzene	17.78	146	15104	0.9781	ug/L	94
94) 1,4-Dichlorobenzene	17.92	146	15615	1.0178	ug/L	74
95) n-Butylbenzene	18.11	91	26687	1.0173	ug/L	97
96) 1,2-Dichlorobenzene	18.41	146	13866	1.0138	ug/L	92
98) 1,2,4-Trichlorobenzene	20.56	180	9543	0.9572	ug/L	95
99) Hexachlorobutadiene	20.71	225	4257	0.9090	ug/L	95
100) Naphthalene	20.94	128	14984	0.9581	ug/L	98
101) 1,2,3-Trichlorobenzene	21.25	180	8410	1.0195	ug/L	94

(#) = qualifier out of range (m) = manual integration
 8M418135.D 8260WT.M Mon Mar 06 12:10:25 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418135.D Vial: 4
Acq On : 3 Mar 2017 10:20 Operator: TMB
Sample : WG604846-04 ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418135.D Vial: 4
 Acq On : 3 Mar 2017 10:20 Operator: TMB
 Sample : WG604846-04 lug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Dichlorodifluoromethane	1.0000	0.9109	8.9	100	0.01
3 P	Chloromethane	1.0000	1.1823	-18.2	100	0.01
4 C	Vinyl Chloride	1.0000	1.1984	-19.8	100	0.01
5 T	1,3-Butadiene	-1.0000	-1.0000	0.0	0	0.03
6 T	Bromomethane	1.0000	1.2712	-27.1#	100	0.00
7 T	Chloroethane	1.0000	1.0314	-3.1	100	0.00
8 T	Trichlorofluoromethane	1.0000	1.0304	-3.0	100	0.00
9 T	Diethyl ether	5.0000	4.7666	4.7	100	0.00
10 T	Isoprene	-1.0000	0.8488	0.0	100	0.00
11 T	Acrolein	-1.0000	1.9462	0.0	100	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	1.0000	0.9174	8.3	100	0.00
13 T	Acetone	-1.0000	0.0000	0.0	0	-6.48#
14 C	1,1-Dichloroethene	1.0000	0.9964	0.4	100	0.00
15 T	Tert-Butyl Alcohol	-1.0000	7.2085	0.0	0	0.00
16 T	Dimethyl Sulfide	-1.0000	0.8718	0.0	100	0.00
17 T	Iodomethane	1.0000	1.5811	-58.1#	100	0.00
18 T	Methyl acetate	-1.0000	0.8951	0.0	100	0.00
19 T	Methylene Chloride	1.0000	0.9879	1.2	100	0.00
20 T	Carbon Disulfide	1.0000	0.9893	1.1	100	0.00
21 T	Acrylonitrile	2.5000	1.9485	22.1	100	0.00
22 T	Methyl Tert Butyl Ether	1.0000	0.9129	8.7	100	0.00
23 T	trans-1,2-Dichloroethene	1.0000	1.0010	-0.1	100	0.00
24 T	n-Hexane	-1.0000	0.9664	0.0	100	0.00
25 T	Diisopropyl ether	5.0000	4.8691	2.6	100	0.00
26 T	Vinyl Acetate	-1.0000	0.8507	0.0	100	0.00
27 P	1,1-Dichloroethane	1.0000	0.9540	4.6	100	0.00
28 T	Ethyl-Tert-Butyl ether	5.0000	4.8043	3.9	100	0.00
29 T	2-Butanone	-1.0000	0.7270	0.0	100	0.01
30 T	Propionitrile	5.0000	4.1109	17.8	100	0.00
31 T	2,2-Dichloropropane	1.0000	1.0153	-1.5	100	0.01
32 T	cis-1,2-Dichloroethene	1.0000	0.9246	7.5	100	0.00
33 C	Chloroform	1.0000	1.0325	-3.2	100	0.00
34	1-Bromopropane	1.0000	0.8141	18.6	100	0.00
35 T	Bromochloromethane	1.0000	0.9665	3.4	100	0.00
36 T	Tetrahydrofuran	5.0000	5.0010	-0.0	100	0.00
37 S	Dibromofluoromethane	-1.0000	0.4414	0.0	100	0.00
38 T	1,1,1-Trichloroethane	1.0000	0.9969	0.3	100	0.01
39 T	Cyclohexane	1.0000	1.0052	-0.5	100	0.01
40 T	1,1-Dichloropropene	1.0000	0.9437	5.6	100	0.00
41 T	Tert-Amyl-Methyl ether	5.0000	4.6356	7.3	100	0.00
42 T	Carbon Tetrachloride	1.0000	0.9747	2.5	100	0.00
43 S	1,2-Dichloroethane-d4	-1.0000	0.4424	0.0	100	0.00
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	1.0000	0.9612	3.9	100	0.00
46 T	Benzene	1.0000	1.0092	-0.9	100	0.00
47 T	Trichloroethene	1.0000	0.9976	0.2	100	0.00
48 T	Methylcyclohexane	-1.0000	0.9744	0.0	100	0.00
49 C	1,2-Dichloropropane	1.0000	1.0014	-0.1	100	0.00
50 T	Bromodichloromethane	1.0000	0.9348	6.5	100	0.00
51 T	1,4-Dioxane	-1.0000	0.0000	0.0	0	-11.96#
52 T	Dibromomethane	1.0000	0.8690	13.1	100	0.00
53 T	2-Chloroethyl Vinyl Ether	-1.0000	0.7136	0.0	0	0.00
54 T	4-Methyl-2-Pentanone	-1.0000	0.1988	0.0	100	0.00

(#) = Out of Range

8M418135.D 8260WT.M

Mon Mar 06 12:34:04 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418135.D Vial: 4
 Acq On : 3 Mar 2017 10:20 Operator: TMB
 Sample : WG604846-04 lug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	1.0000	0.9051	9.5	100	0.00
56 T	Dimethyl Disulfide	-1.0000	0.5545	0.0	100	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
58 S	Toluene-d8	-1.0000	0.5025	0.0	100	0.00
59 C	Toluene	1.0000	1.0402	-4.0	100	0.00
60 T	Ethyl Methacrylate	1.0000	1.1569	-15.7	100	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	1.0000	0.8374	16.3	100	0.00
63 T	1,1,2-Trichloroethane	1.0000	0.9372	6.3	100	0.00
64 T	2-Hexanone	-1.0000	0.0000	0.0	0	-13.36#
65 T	1,3-Dichloropropane	1.0000	0.9709	2.9	100	0.00
66 T	Tetrachloroethene	1.0000	0.9968	0.3	100	0.00
67 T	Dibromochloromethane	1.0000	0.8477	15.2	100	0.00
68 T	1,2-Dibromoethane	1.0000	0.8327	16.7	100	0.00
69 T	1-Chlorohexane	1.0000	0.9650	3.5	100	0.00
70 P	Chlorobenzene	1.0000	0.9967	0.3	100	0.00
71 T	1,1,1,2-Tetrachloroethane	1.0000	0.8595	14.1	100	0.00
72 C	Ethylbenzene	1.0000	0.9079	9.2	100	0.00
73 T	m-,p-Xylene	2.0000	1.9176	4.1	100	0.00
74 T	o-Xylene	1.0000	0.9067	9.3	100	0.00
75 T	Styrene	1.0000	0.8567	14.3	100	0.00
76 P	Bromoform	1.0000	1.1594	-15.9	100	0.00
77 T	Isopropylbenzene	1.0000	1.0157	-1.6	100	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
79 P	1,1,2,2-Tetrachloroethane	1.0000	0.8987	10.1	100	0.00
80 S	p-Bromofluorobenzene	-1.0000	0.5267	0.0	100	0.00
81 T	1,2,3-Trichloropropane	1.0000	0.8363	16.4	100	0.00
82 T	trans-1,4-Dichloro-2-Butene	1.0000	0.9931	0.7	100	0.00
83 T	n-Propylbenzene	1.0000	1.0584	-5.8	100	0.00
84 T	Bromobenzene	1.0000	0.9793	2.1	100	0.00
85 T	1,3,5-Trimethylbenzene	1.0000	0.9832	1.7	100	0.00
86 T	2-Chlorotoluene	1.0000	1.0197	-2.0	100	0.00
87 T	4-Chlorotoluene	1.0000	1.0110	-1.1	100	0.00
88 T	a-Methylstyrene	-1.0000	0.7494	0.0	100	0.00
89 T	tert-Butylbenzene	1.0000	0.8871	11.3	100	0.00
90 T	1,2,4-Trimethylbenzene	1.0000	1.0034	-0.3	100	0.00
91 T	sec-Butylbenzene	1.0000	1.0282	-2.8	100	0.00
92 T	p-Isopropyltoluene	1.0000	0.9711	2.9	100	0.00
93 T	1,3-Dichlorobenzene	1.0000	0.9781	2.2	100	0.00
94 T	1,4-Dichlorobenzene	1.0000	1.0178	-1.8	100	0.00
95 T	n-Butylbenzene	1.0000	1.0173	-1.7	100	0.00
96 T	1,2-Dichlorobenzene	1.0000	1.0138	-1.4	100	0.00
97 T	1,2-Dibromo-3-Chloropropane	-1.0000	0.0000	0.0	0	-19.41#
98 T	1,2,4-Trichlorobenzene	1.0000	0.9572	4.3	100	0.00
99 T	Hexachlorobutadiene	1.0000	0.9090	9.1	100	0.00
100 T	Naphthalene	1.0000	0.9581	4.2	100	0.00
101 T	1,2,3-Trichlorobenzene	1.0000	1.0196	-2.0	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418135.D 8260WT.M Mon Mar 06 12:34:05 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418136.D Vial: 5
 Acq On : 3 Mar 2017 10:49 Operator: TMB
 Sample : WG604846-05 2ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:26 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	626919	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	470963	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	251541	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.90	111	6049	0.9395	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	3.76%#	
43) 1,2-Dichloroethane-d4	10.54	65	5502	0.9750	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	3.88%#	
58) Toluene-d8	12.93	98	20600	0.9301	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	3.72%#	
80) p-Bromofluorobenzene	16.34	95	7729	0.8878	ug/L	-0.01
Spiked Amount	25.000	Range 86 - 115	Recovery	=	3.56%#	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.35	85	15013	1.7888	ug/L	90
3) Chloromethane	3.82	50	25554	2.1506	ug/L	97
4) Vinyl Chloride	4.06	62	22774	2.1972	ug/L	95
5) 1,3-Butadiene	4.11	54	13940	0.8356	ug/L	85
6) Bromomethane	4.97	94	6983	1.9723	ug/L	99
7) Chloroethane	5.12	64	8382	1.8937	ug/L	93
8) Trichlorofluoromethane	5.61	101	20600	1.9224	ug/L	95
9) Diethyl ether	6.14	59	101125	24.2897	ug/L	98
10) Isoprene	6.18	67	16869	1.7588	ug/L	97
11) Acrolein	6.38	56	6349	11.3318	ug/L	97
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	11448	1.8334	ug/L	93
13) Acetone	6.48	43	1320	1.6588	ug/L #	43
14) 1,1-Dichloroethene	6.71	61	17511	1.8300	ug/L	93
15) Tert-Butyl Alcohol	6.81	59	12663	49.3868	ug/L #	90
16) Dimethyl Sulfide	6.97	62	12431	1.7506	ug/L	97
17) Iodomethane	7.23	142	3542	1.8998	ug/L	77
18) Methyl acetate	7.24	43	4361	1.8262	ug/L #	79
19) Methylene Chloride	7.49	84	13116	1.9766	ug/L	90
20) Carbon Disulfide	7.54	76	38377	1.8800	ug/L	100
21) Acrylonitrile	7.67	53	13951	11.8718	ug/L	88
22) Methyl Tert Butyl Ether	7.70	73	23364	1.8956	ug/L	93
23) trans-1,2-Dichloroethene	7.94	61	16645	1.8041	ug/L	87
24) n-Hexane	8.02	57	16569	1.8734	ug/L	94
25) Diisopropyl ether	8.35	45	457148	24.3009	ug/L	98
26) Vinyl Acetate	8.53	43	14073	1.9926	ug/L	96
27) 1,1-Dichloroethane	8.57	63	21923	1.8814	ug/L	98
28) Ethyl-Tert-Butyl ether	8.93	59	425043	24.5566	ug/L	100
29) 2-Butanone	9.13	43	2440	1.8528	ug/L #	50
30) Propionitrile	9.22	54	10188	24.2601	ug/L	96
31) 2,2-Dichloropropane	9.34	77	18717	1.8951	ug/L	99
32) cis-1,2-Dichloroethene	9.41	96	13735	1.9066	ug/L	81
33) Chloroform	9.61	83	23129	1.8920	ug/L	97
34) 1-Bromopropane	9.76	122	2594	1.8542	ug/L	99
35) Bromochloromethane	9.85	130	7143	1.8209	ug/L	99
36) Tetrahydrofuran	9.87	42	20496	24.5255	ug/L	99
38) 1,1,1-Trichloroethane	10.14	97	19365	1.8709	ug/L	99
39) Cyclohexane	10.17	56	19722	1.7988	ug/L	99
40) 1,1-Dichloropropene	10.34	75	15712	1.7828	ug/L	96
41) Tert-Amyl-Methyl ether	10.44	73	354100	24.6621	ug/L	100
42) Carbon Tetrachloride	10.48	117	16988	1.7860	ug/L	97

(#) = qualifier out of range (m) = manual integration
 8M418136.D 8260WT.M Mon Mar 06 12:10:29 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418136.D Vial: 5
 Acq On : 3 Mar 2017 10:49 Operator: TMB
 Sample : WG604846-05 2ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:26 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

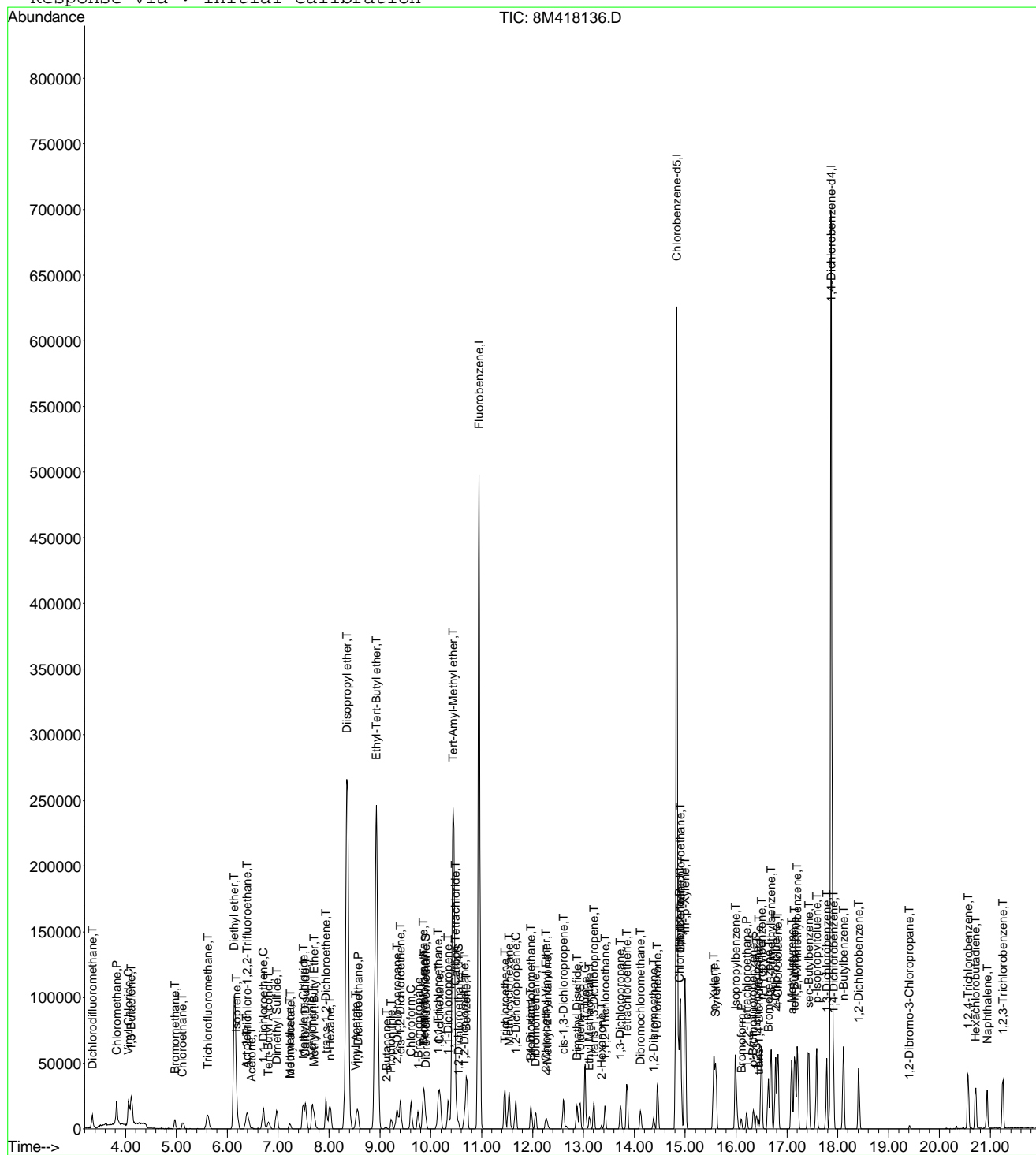
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	14373	1.9522	ug/L	94
46) Benzene	10.70	78	49497	1.9474	ug/L	97
47) Trichloroethene	11.45	130	13537	1.8368	ug/L	99
48) Methylcyclohexane	11.54	83	20054	1.8222	ug/L	96
49) 1,2-Dichloropropane	11.67	63	12064	1.8950	ug/L	93
50) Bromodichloromethane	11.97	83	15411	1.8346	ug/L	97
51) 1,4-Dioxane	11.96	88	873	28.3491	ug/L	97
52) Dibromomethane	12.05	93	6106	1.9125	ug/L	97
53) 2-Chloroethyl Vinyl Ether	12.26	63	4845	1.7059	ug/L	94
54) 4-Methyl-2-Pentanone	12.29	58	2013	1.5951	ug/L #	41
55) cis-1,3-Dichloropropene	12.60	75	17533	1.8160	ug/L	97
56) Dimethyl Disulfide	12.87	79	6647	1.2619	ug/L	92
59) Toluene	13.04	91	52151	1.9668	ug/L	98
60) Ethyl Methacrylate	13.12	69	8290	1.9939	ug/L	100
62) trans-1,3-Dichloropropene	13.20	75	14279	1.8016	ug/L	97
63) 1,1,2-Trichloroethane	13.43	97	8611	1.9844	ug/L	92
64) 2-Hexanone	13.36	58	1323	1.1847	ug/L #	5
65) 1,3-Dichloropropane	13.73	76	14285	1.9417	ug/L	98
66) Tetrachloroethene	13.85	164	10408	1.8216	ug/L	98
67) Dibromochloromethane	14.12	129	10301	1.8188	ug/L	98
68) 1,2-Dibromoethane	14.38	107	8562	2.0134	ug/L	97
69) 1-Chlorohexane	14.45	91	16551	1.7971	ug/L	97
70) Chlorobenzene	14.89	112	36877	1.9167	ug/L	93
71) 1,1,1,2-Tetrachloroethane	14.91	131	12418	1.7989	ug/L	98
72) Ethylbenzene	14.91	106	19112	1.7598	ug/L	91
73) m-,p-Xylene	15.00	106	46763	3.7583	ug/L	93
74) o-Xylene	15.56	106	22139	1.7771	ug/L	94
75) Styrene	15.60	104	33869	1.7283	ug/L	100
76) Bromoform	16.11	173	5309	1.9628	ug/L	92
77) Isopropylbenzene	15.99	105	58032	1.9018	ug/L	98
79) 1,1,2,2-Tetrachloroethane	16.21	83	9396	2.0145	ug/L	97
81) 1,2,3-Trichloropropane	16.41	110	2413	1.7817	ug/L	73
82) trans-1,4-Dichloro-2-Butene	16.45	53	1922	1.9629	ug/L	47
83) n-Propylbenzene	16.50	91	72151	2.0042	ug/L	98
84) Bromobenzene	16.63	156	14597	1.8662	ug/L	95
85) 1,3,5-Trimethylbenzene	16.69	105	50055	1.9426	ug/L	95
86) 2-Chlorotoluene	16.78	91	47728	1.9653	ug/L	99
87) 4-Chlorotoluene	16.82	91	41245	1.9467	ug/L	97
88) a-Methylstyrene	17.09	118	23443	1.5647	ug/L	98
89) tert-Butylbenzene	17.15	134	11052	1.8589	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	51321	1.9140	ug/L	86
91) sec-Butylbenzene	17.43	105	65186	1.9612	ug/L	98
92) p-Isopropyltoluene	17.59	119	52374	1.8774	ug/L	99
93) 1,3-Dichlorobenzene	17.78	146	30139	1.9076	ug/L	96
94) 1,4-Dichlorobenzene	17.92	146	30884	1.9677	ug/L	89
95) n-Butylbenzene	18.11	91	51428	1.9161	ug/L	98
96) 1,2-Dichlorobenzene	18.41	146	27377	1.9564	ug/L	93
97) 1,2-Dibromo-3-Chloropropane	19.41	75	974	1.8663	ug/L	81
98) 1,2,4-Trichlorobenzene	20.56	180	19857	1.9467	ug/L	99
99) Hexachlorobutadiene	20.71	225	9371	1.9557	ug/L	97
100) Naphthalene	20.94	128	32152	2.0095	ug/L	100
101) 1,2,3-Trichlorobenzene	21.25	180	17043	2.0194	ug/L	97

(#) = qualifier out of range (m) = manual integration
 8M418136.D 8260WT.M Mon Mar 06 12:10:29 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418136.D Vial: 5
 Acq On : 3 Mar 2017 10:49 Operator: TMB
 Sample : WG604846-05 2ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418136.D Vial: 5
 Acq On : 3 Mar 2017 10:49 Operator: TMB
 Sample : WG604846-05 2ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Dichlorodifluoromethane	2.0000	1.7888	10.6	100	0.01
3 P	Chloromethane	2.0000	2.1506	-7.5	100	0.01
4 C	Vinyl Chloride	2.0000	2.1972	-9.9	100	0.01
5 T	1,3-Butadiene	2.0000	0.8356	58.2#	100	0.02
6 T	Bromomethane	2.0000	1.9723	1.4	100	0.01
7 T	Chloroethane	2.0000	1.8937	5.3	100	-0.01
8 T	Trichlorofluoromethane	2.0000	1.9224	3.9	100	0.00
9 T	Diethyl ether	25.0000	24.2897	2.8	100	0.00
10 T	Isoprene	-1.0000	1.7588	0.0	100	0.00
11 T	Acrolein	12.5000	11.3318	9.3	100	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	2.0000	1.8334	8.3	100	0.00
13 T	Acetone	-1.0000	1.6588	0.0	100	0.00
14 C	1,1-Dichloroethene	2.0000	1.8300	8.5	100	0.00
15 T	Tert-Butyl Alcohol	50.0000	49.3867	1.2	100	-0.01
16 T	Dimethyl Sulfide	-1.0000	1.7506	0.0	100	0.00
17 T	Iodomethane	2.0000	1.8998	5.0	100	0.00
18 T	Methyl acetate	-1.0000	1.8262	0.0	100	0.00
19 T	Methylene Chloride	2.0000	1.9766	1.2	100	0.00
20 T	Carbon Disulfide	2.0000	1.8800	6.0	100	0.00
21 T	Acrylonitrile	12.5000	11.8718	5.0	100	0.00
22 T	Methyl Tert Butyl Ether	2.0000	1.8957	5.2	100	0.00
23 T	trans-1,2-Dichloroethene	2.0000	1.8041	9.8	100	0.00
24 T	n-Hexane	-1.0000	1.8734	0.0	100	0.01
25 T	Diisopropyl ether	25.0000	24.3009	2.8	100	0.00
26 T	Vinyl Acetate	-1.0000	1.9926	0.0	100	0.00
27 P	1,1-Dichloroethane	2.0000	1.8814	5.9	100	0.01
28 T	Ethyl-Tert-Butyl ether	25.0000	24.5566	1.8	100	0.00
29 T	2-Butanone	-1.0000	1.8528	0.0	100	0.01
30 T	Propionitrile	25.0000	24.2601	3.0	100	-0.01
31 T	2,2-Dichloropropane	2.0000	1.8951	5.2	100	0.00
32 T	cis-1,2-Dichloroethene	2.0000	1.9066	4.7	100	0.00
33 C	Chloroform	2.0000	1.8920	5.4	100	0.00
34	1-Bromopropane	2.0000	1.8542	7.3	100	0.01
35 T	Bromochloromethane	2.0000	1.8209	9.0	100	0.00
36 T	Tetrahydrofuran	25.0000	24.5255	1.9	100	0.00
37 S	Dibromofluoromethane	1.0000	0.9395	6.1	100	0.00
38 T	1,1,1-Trichloroethane	2.0000	1.8709	6.5	100	0.00
39 T	Cyclohexane	2.0000	1.7988	10.1	100	0.00
40 T	1,1-Dichloropropene	2.0000	1.7828	10.9	100	0.00
41 T	Tert-Amyl-Methyl ether	25.0000	24.6621	1.4	100	0.00
42 T	Carbon Tetrachloride	2.0000	1.7860	10.7	100	-0.01
43 S	1,2-Dichloroethane-d4	1.0000	0.9750	2.5	100	0.00
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	2.0000	1.9522	2.4	100	0.00
46 T	Benzene	2.0000	1.9474	2.6	100	0.00
47 T	Trichloroethene	2.0000	1.8368	8.2	100	0.00
48 T	Methylcyclohexane	-1.0000	1.8222	0.0	100	0.00
49 C	1,2-Dichloropropane	2.0000	1.8950	5.3	100	0.00
50 T	Bromodichloromethane	2.0000	1.8346	8.3	100	0.00
51 T	1,4-Dioxane	-1.0000	28.3491	0.0	0	0.00
52 T	Dibromomethane	2.0000	1.9125	4.4	100	-0.01
53 T	2-Chloroethyl Vinyl Ether	2.0000	1.7059	14.7	100	0.00
54 T	4-Methyl-2-Pentanone	-1.0000	1.5951	0.0	100	0.00

(#) = Out of Range

8M418136.D 8260WT.M

Mon Mar 06 12:13:16 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418136.D Vial: 5
 Acq On : 3 Mar 2017 10:49 Operator: TMB
 Sample : WG604846-05 2ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	2.0000	1.8160	9.2	100	-0.01
56 T	Dimethyl Disulfide	-1.0000	1.2619	0.0	100	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
58 S	Toluene-d8	1.0000	0.9301	7.0	100	0.00
59 C	Toluene	2.0000	1.9668	1.7	100	0.00
60 T	Ethyl Methacrylate	2.0000	1.9939	0.3	100	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	2.0000	1.8016	9.9	100	0.00
63 T	1,1,2-Trichloroethane	2.0000	1.9844	0.8	100	0.00
64 T	2-Hexanone	-1.0000	1.1847	0.0	100	0.00
65 T	1,3-Dichloropropane	2.0000	1.9417	2.9	100	0.00
66 T	Tetrachloroethene	2.0000	1.8216	8.9	100	0.00
67 T	Dibromochloromethane	2.0000	1.8188	9.1	100	0.00
68 T	1,2-Dibromoethane	2.0000	2.0134	-0.7	100	0.00
69 T	1-Chlorohexane	2.0000	1.7971	10.1	100	-0.01
70 P	Chlorobenzene	2.0000	1.9168	4.2	100	0.00
71 T	1,1,1,2-Tetrachloroethane	2.0000	1.7989	10.1	100	-0.01
72 C	Ethylbenzene	2.0000	1.7598	12.0	100	0.00
73 T	m-,p-Xylene	4.0000	3.7583	6.0	100	0.00
74 T	o-Xylene	2.0000	1.7771	11.1	100	-0.01
75 T	Styrene	2.0000	1.7283	13.6	100	0.00
76 P	Bromoform	2.0000	1.9628	1.9	100	0.00
77 T	Isopropylbenzene	2.0000	1.9018	4.9	100	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
79 P	1,1,2,2-Tetrachloroethane	2.0000	2.0145	-0.7	100	0.00
80 S	p-Bromofluorobenzene	1.0000	0.8878	11.2	100	-0.01
81 T	1,2,3-Trichloropropane	2.0000	1.7817	10.9	100	0.00
82 T	trans-1,4-Dichloro-2-Butene	2.0000	1.9629	1.9	100	0.00
83 T	n-Propylbenzene	2.0000	2.0042	-0.2	100	0.00
84 T	Bromobenzene	2.0000	1.8662	6.7	100	0.00
85 T	1,3,5-Trimethylbenzene	2.0000	1.9426	2.9	100	-0.01
86 T	2-Chlorotoluene	2.0000	1.9653	1.7	100	0.00
87 T	4-Chlorotoluene	2.0000	1.9467	2.7	100	-0.01
88 T	a-Methylstyrene	-1.0000	1.5647	0.0	100	-0.01
89 T	tert-Butylbenzene	2.0000	1.8589	7.1	100	-0.01
90 T	1,2,4-Trimethylbenzene	2.0000	1.9140	4.3	100	-0.01
91 T	sec-Butylbenzene	2.0000	1.9612	1.9	100	0.00
92 T	p-Isopropyltoluene	2.0000	1.8774	6.1	100	0.00
93 T	1,3-Dichlorobenzene	2.0000	1.9076	4.6	100	0.00
94 T	1,4-Dichlorobenzene	2.0000	1.9677	1.6	100	0.00
95 T	n-Butylbenzene	2.0000	1.9161	4.2	100	0.00
96 T	1,2-Dichlorobenzene	2.0000	1.9564	2.2	100	0.00
97 T	1,2-Dibromo-3-Chloropropane	2.0000	1.8663	6.7	100	0.00
98 T	1,2,4-Trichlorobenzene	2.0000	1.9467	2.7	100	0.00
99 T	Hexachlorobutadiene	2.0000	1.9557	2.2	100	0.00
100 T	Naphthalene	2.0000	2.0095	-0.5	100	0.00
101 T	1,2,3-Trichlorobenzene	2.0000	2.0194	-1.0	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418136.D 8260WT.M Mon Mar 06 12:13:16 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418137.D Vial: 6
 Acq On : 3 Mar 2017 11:18 Operator: TMB
 Sample : WG604846-06 5ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:30 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	635457	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	483357	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.87	152	257360	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.89	111	16418	2.5156	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	10.08%#	
43) 1,2-Dichloroethane-d4	10.54	65	13979	2.4439	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	9.76%#	
58) Toluene-d8	12.93	98	58220	2.5611	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	10.24%#	
80) p-Bromofluorobenzene	16.35	95	22442	2.5194	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	10.08%#	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.34	85	40088	4.7122	ug/L	98
3) Chloromethane	3.83	50	62721	5.2076	ug/L	100
4) Vinyl Chloride	4.06	62	56154	5.3447	ug/L	97
5) 1,3-Butadiene	4.11	54	36847	5.6691	ug/L	96
6) Bromomethane	4.96	94	20109	4.5341	ug/L	99
7) Chloroethane	5.13	64	22523	5.0201	ug/L	96
8) Trichlorofluoromethane	5.62	101	55502	5.1097	ug/L	99
9) Diethyl ether	6.14	59	205825	48.7739	ug/L	99
10) Isoprene	6.18	67	45217	4.6510	ug/L	96
11) Acrolein	6.38	56	13199	23.2413	ug/L	96
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	32767	5.1771	ug/L	98
13) Acetone	6.47	43	3708	4.5970	ug/L	88
14) 1,1-Dichloroethene	6.71	61	48006	4.9495	ug/L	95
15) Tert-Butyl Alcohol	6.81	59	25114	96.6307	ug/L	95
16) Dimethyl Sulfide	6.97	62	32649	4.5359	ug/L	98
17) Iodomethane	7.23	142	13985	3.4824	ug/L	100
18) Methyl acetate	7.24	43	11144	4.6040	ug/L #	94
19) Methylene Chloride	7.50	84	33344	4.9574	ug/L	93
20) Carbon Disulfide	7.54	76	101438	4.9026	ug/L	99
21) Acrylonitrile	7.67	53	28346	23.7973	ug/L	96
22) Methyl Tert Butyl Ether	7.70	73	60614	4.8519	ug/L	96
23) trans-1,2-Dichloroethene	7.94	61	46113	4.9308	ug/L	96
24) n-Hexane	8.01	57	45101	5.0308	ug/L	96
25) Diisopropyl ether	8.35	45	947837	49.7077	ug/L	98
26) Vinyl Acetate	8.53	43	37042	5.1742	ug/L	98
27) 1,1-Dichloroethane	8.56	63	59303	5.0209	ug/L	99
28) Ethyl-Tert-Butyl ether	8.93	59	859758	49.0047	ug/L	100
29) 2-Butanone	9.12	43	6304	4.7227	ug/L	91
30) Propionitrile	9.22	54	20546	48.2676	ug/L	92
31) 2,2-Dichloropropane	9.34	77	51659	5.1602	ug/L	99
32) cis-1,2-Dichloroethene	9.41	96	37296	5.1077	ug/L	92
33) Chloroform	9.62	83	59525	4.8039	ug/L	100
34) 1-Bromopropane	9.75	122	6929	4.8864	ug/L	99
35) Bromochloromethane	9.84	130	20473	5.1488	ug/L	96
36) Tetrahydrofuran	9.86	42	39934	47.1429	ug/L	98
38) 1,1,1-Trichloroethane	10.14	97	51349	4.8944	ug/L	99
39) Cyclohexane	10.17	56	53840	4.8447	ug/L	98
40) 1,1-Dichloropropene	10.34	75	45459	5.0888	ug/L	100
41) Tert-Amyl-Methyl ether	10.44	73	716455	49.2287	ug/L	99
42) Carbon Tetrachloride	10.48	117	47967	4.9752	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418137.D 8260WT.M Mon Mar 06 12:10:33 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418137.D Vial: 6
 Acq On : 3 Mar 2017 11:18 Operator: TMB
 Sample : WG604846-06 5ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:30 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

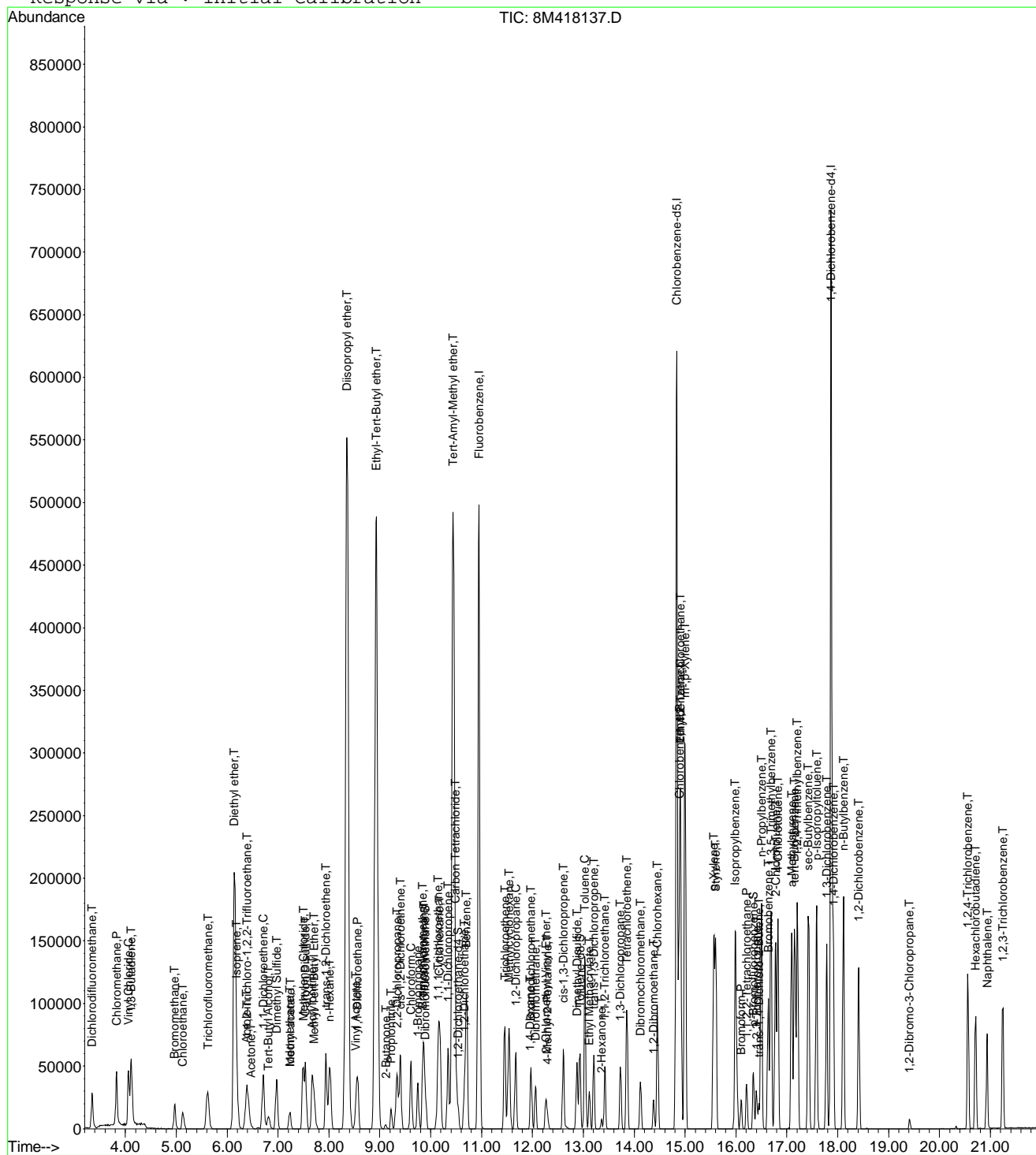
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	37338	5.0033	ug/L	98
46) Benzene	10.70	78	133494	5.1815	ug/L	98
47) Trichloroethene	11.46	130	36639	4.9046	ug/L	97
48) Methylcyclohexane	11.54	83	54845	4.9166	ug/L	97
49) 1,2-Dichloropropane	11.67	63	32532	5.0414	ug/L	94
50) Bromodichloromethane	11.97	83	40864	4.7993	ug/L	98
51) 1,4-Dioxane	11.95	88	2837	90.8886	ug/L	93
52) Dibromomethane	12.06	93	15780	4.8762	ug/L	94
53) 2-Chloroethyl Vinyl Ether	12.26	63	12827	4.4556	ug/L	97
54) 4-Methyl-2-Pentanone	12.29	58	5132	4.0119	ug/L	89
55) cis-1,3-Dichloropropene	12.60	75	47793	4.8837	ug/L	99
56) Dimethyl Disulfide	12.87	79	20287	3.7998	ug/L	96
59) Toluene	13.03	91	144303	5.3026	ug/L	98
60) Ethyl Methacrylate	13.12	69	23068	4.4473	ug/L	96
62) trans-1,3-Dichloropropene	13.20	75	40783	5.0137	ug/L	97
63) 1,1,2-Trichloroethane	13.42	97	21573	4.8439	ug/L	97
64) 2-Hexanone	13.36	58	4349	3.7945	ug/L #	48
65) 1,3-Dichloropropane	13.73	76	37743	4.9986	ug/L	93
66) Tetrachloroethene	13.85	164	29983	5.1129	ug/L	91
67) Dibromochloromethane	14.12	129	27328	4.7013	ug/L	97
68) 1,2-Dibromoethane	14.38	107	21440	4.9125	ug/L	99
69) 1-Chlorohexane	14.45	91	47325	5.0068	ug/L	98
70) Chlorobenzene	14.89	112	99241	5.0260	ug/L	97
71) 1,1,1,2-Tetrachloroethane	14.91	131	33479	4.7254	ug/L	99
72) Ethylbenzene	14.91	106	52796	4.7367	ug/L	91
73) m-,p-Xylene	15.00	106	129845	10.1680	ug/L	95
74) o-Xylene	15.56	106	61865	4.8385	ug/L	98
75) Styrene	15.60	104	99796	4.9618	ug/L	94
76) Bromoform	16.10	173	14999	4.4178	ug/L	99
77) Isopropylbenzene	15.98	105	164105	5.2402	ug/L	96
79) 1,1,2,2-Tetrachloroethane	16.21	83	24365	5.1058	ug/L	99
81) 1,2,3-Trichloropropane	16.41	110	7178	5.1801	ug/L	89
82) trans-1,4-Dichloro-2-Butene	16.45	53	6464	5.0118	ug/L	85
83) n-Propylbenzene	16.50	91	202205	5.4899	ug/L	97
84) Bromobenzene	16.64	156	40803	5.0987	ug/L	93
85) 1,3,5-Trimethylbenzene	16.69	105	135225	5.1292	ug/L	100
86) 2-Chlorotoluene	16.78	91	131174	5.2794	ug/L	99
87) 4-Chlorotoluene	16.82	91	114500	5.2820	ug/L	100
88) a-Methylstyrene	17.09	118	69136	4.5102	ug/L	99
89) tert-Butylbenzene	17.15	134	28866	4.7455	ug/L	93
90) 1,2,4-Trimethylbenzene	17.20	105	144572	5.2699	ug/L	97
91) sec-Butylbenzene	17.42	105	184154	5.4153	ug/L	97
92) p-Isopropyltoluene	17.59	119	150555	5.2749	ug/L	99
93) 1,3-Dichlorobenzene	17.78	146	82111	5.0795	ug/L	96
94) 1,4-Dichlorobenzene	17.92	146	81209	5.0570	ug/L	98
95) n-Butylbenzene	18.11	91	145875	5.3122	ug/L	97
96) 1,2-Dichlorobenzene	18.41	146	71773	5.0130	ug/L	96
97) 1,2-Dibromo-3-Chloropropane	19.41	75	3379	4.7584	ug/L	97
98) 1,2,4-Trichlorobenzene	20.55	180	51816	4.9649	ug/L	98
99) Hexachlorobutadiene	20.71	225	24691	5.0364	ug/L	97
100) Naphthalene	20.94	128	81656	4.9880	ug/L	99
101) 1,2,3-Trichlorobenzene	21.25	180	42775	4.9539	ug/L	97

(#) = qualifier out of range (m) = manual integration
 8M418137.D 8260WT.M Mon Mar 06 12:10:33 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418137.D Vial: 6
 Acq On : 3 Mar 2017 11:18 Operator: TMB
 Sample : WG604846-06 5ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418137.D Vial: 6
 Acq On : 3 Mar 2017 11:18 Operator: TMB
 Sample : WG604846-06 5ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Dichlorodifluoromethane	5.0000	4.7122	5.8	100	0.00
3 P	Chloromethane	5.0000	5.2076	-4.2	100	0.01
4 C	Vinyl Chloride	5.0000	5.3448	-6.9	100	0.01
5 T	1,3-Butadiene	5.0000	5.6691	-13.4	100	0.02
6 T	Bromomethane	5.0000	4.5341	9.3	100	0.00
7 T	Chloroethane	5.0000	5.0201	-0.4	100	0.00
8 T	Trichlorofluoromethane	5.0000	5.1098	-2.2	100	0.01
9 T	Diethyl ether	50.0000	48.7739	2.5	100	0.00
10 T	Isoprene	5.0000	4.6510	7.0	100	0.00
11 T	Acrolein	25.0000	23.2413	7.0	100	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	5.0000	5.1771	-3.5	100	0.00
13 T	Acetone	5.0000	4.5970	8.1	100	0.00
14 C	1,1-Dichloroethene	5.0000	4.9495	1.0	100	0.00
15 T	Tert-Butyl Alcohol	100.0000	96.6307	3.4	100	0.00
16 T	Dimethyl Sulfide	5.0000	4.5359	9.3	100	0.00
17 T	Iodomethane	5.0000	3.4825	30.4#	100	0.00
18 T	Methyl acetate	5.0000	4.6040	7.9	100	0.00
19 T	Methylene Chloride	5.0000	4.9574	0.9	100	0.00
20 T	Carbon Disulfide	5.0000	4.9026	1.9	100	0.00
21 T	Acrylonitrile	25.0000	23.7973	4.8	100	0.00
22 T	Methyl Tert Butyl Ether	5.0000	4.8519	3.0	100	0.00
23 T	trans-1,2-Dichloroethene	5.0000	4.9308	1.4	100	0.00
24 T	n-Hexane	5.0000	5.0308	-0.6	100	0.00
25 T	Diisopropyl ether	50.0000	49.7077	0.6	100	0.00
26 T	Vinyl Acetate	5.0000	5.1742	-3.5	100	0.00
27 P	1,1-Dichloroethane	5.0000	5.0209	-0.4	100	0.00
28 T	Ethyl-Tert-Butyl ether	50.0000	49.0047	2.0	100	0.00
29 T	2-Butanone	5.0000	4.7227	5.5	100	0.00
30 T	Propionitrile	50.0000	48.2676	3.5	100	0.00
31 T	2,2-Dichloropropane	5.0000	5.1602	-3.2	100	0.00
32 T	cis-1,2-Dichloroethene	5.0000	5.1077	-2.2	100	0.00
33 C	Chloroform	5.0000	4.8039	3.9	100	0.00
34	1-Bromopropane	5.0000	4.8864	2.3	100	0.00
35 T	Bromochloromethane	5.0000	5.1488	-3.0	100	0.00
36 T	Tetrahydrofuran	50.0000	47.1429	5.7	100	0.00
37 S	Dibromofluoromethane	2.5000	2.5156	-0.6	100	0.00
38 T	1,1,1-Trichloroethane	5.0000	4.8944	2.1	100	0.00
39 T	Cyclohexane	5.0000	4.8447	3.1	100	0.00
40 T	1,1-Dichloropropene	5.0000	5.0888	-1.8	100	0.00
41 T	Tert-Amyl-Methyl ether	50.0000	49.2287	1.5	100	0.00
42 T	Carbon Tetrachloride	5.0000	4.9752	0.5	100	0.00
43 S	1,2-Dichloroethane-d4	2.5000	2.4439	2.2	100	0.00
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	5.0000	5.0033	-0.1	100	0.00
46 T	Benzene	5.0000	5.1815	-3.6	100	0.00
47 T	Trichloroethene	5.0000	4.9046	1.9	100	0.00
48 T	Methylcyclohexane	5.0000	4.9166	1.7	100	0.00
49 C	1,2-Dichloropropane	5.0000	5.0414	-0.8	100	0.00
50 T	Bromodichloromethane	5.0000	4.7993	4.0	100	0.00
51 T	1,4-Dioxane	100.0000	90.8886	9.1	100	0.00
52 T	Dibromomethane	5.0000	4.8762	2.5	100	0.00
53 T	2-Chloroethyl Vinyl Ether	5.0000	4.4556	10.9	100	0.00
54 T	4-Methyl-2-Pentanone	5.0000	4.0119	19.8	100	0.00

(#) = Out of Range

8M418137.D 8260WT.M

Mon Mar 06 12:13:27 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418137.D Vial: 6
 Acq On : 3 Mar 2017 11:18 Operator: TMB
 Sample : WG604846-06 5ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	5.0000	4.8837	2.3	100	0.00
56 T	Dimethyl Disulfide	5.0000	3.7998	24.0	100	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
58 S	Toluene-d8	2.5000	2.5611	-2.4	100	0.00
59 C	Toluene	5.0000	5.3026	-6.1	100	0.00
60 T	Ethyl Methacrylate	5.0000	4.4473	11.1	100	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	5.0000	5.0137	-0.3	100	0.00
63 T	1,1,2-Trichloroethane	5.0000	4.8439	3.1	100	0.00
64 T	2-Hexanone	5.0000	3.7945	24.1	100	0.00
65 T	1,3-Dichloropropane	5.0000	4.9986	0.0	100	0.00
66 T	Tetrachloroethene	5.0000	5.1129	-2.3	100	0.00
67 T	Dibromochloromethane	5.0000	4.7013	6.0	100	0.00
68 T	1,2-Dibromoethane	5.0000	4.9125	1.8	100	0.00
69 T	1-Chlorohexane	5.0000	5.0068	-0.1	100	0.00
70 P	Chlorobenzene	5.0000	5.0260	-0.5	100	0.00
71 T	1,1,1,2-Tetrachloroethane	5.0000	4.7254	5.5	100	0.00
72 C	Ethylbenzene	5.0000	4.7367	5.3	100	0.00
73 T	m-,p-Xylene	10.0000	10.1680	-1.7	100	0.00
74 T	o-Xylene	5.0000	4.8385	3.2	100	0.00
75 T	Styrene	5.0000	4.9618	0.8	100	0.00
76 P	Bromoform	5.0000	4.4178	11.6	100	0.00
77 T	Isopropylbenzene	5.0000	5.2402	-4.8	100	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
79 P	1,1,2,2-Tetrachloroethane	5.0000	5.1058	-2.1	100	0.00
80 S	p-Bromofluorobenzene	2.5000	2.5194	-0.8	100	0.00
81 T	1,2,3-Trichloropropane	5.0000	5.1801	-3.6	100	0.00
82 T	trans-1,4-Dichloro-2-Butene	5.0000	5.0118	-0.2	100	0.00
83 T	n-Propylbenzene	5.0000	5.4900	-9.8	100	0.00
84 T	Bromobenzene	5.0000	5.0987	-2.0	100	0.00
85 T	1,3,5-Trimethylbenzene	5.0000	5.1292	-2.6	100	0.00
86 T	2-Chlorotoluene	5.0000	5.2794	-5.6	100	0.00
87 T	4-Chlorotoluene	5.0000	5.2820	-5.6	100	0.00
88 T	a-Methylstyrene	5.0000	4.5102	9.8	100	0.00
89 T	tert-Butylbenzene	5.0000	4.7455	5.1	100	0.00
90 T	1,2,4-Trimethylbenzene	5.0000	5.2699	-5.4	100	0.00
91 T	sec-Butylbenzene	5.0000	5.4153	-8.3	100	0.00
92 T	p-Isopropyltoluene	5.0000	5.2749	-5.5	100	0.00
93 T	1,3-Dichlorobenzene	5.0000	5.0795	-1.6	100	0.00
94 T	1,4-Dichlorobenzene	5.0000	5.0569	-1.1	100	0.00
95 T	n-Butylbenzene	5.0000	5.3122	-6.2	100	0.00
96 T	1,2-Dichlorobenzene	5.0000	5.0130	-0.3	100	0.00
97 T	1,2-Dibromo-3-Chloropropane	5.0000	4.7584	4.8	100	0.00
98 T	1,2,4-Trichlorobenzene	5.0000	4.9649	0.7	100	0.00
99 T	Hexachlorobutadiene	5.0000	5.0364	-0.7	100	0.00
100 T	Naphthalene	5.0000	4.9880	0.2	100	0.00
101 T	1,2,3-Trichlorobenzene	5.0000	4.9539	0.9	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418137.D 8260WT.M Mon Mar 06 12:13:27 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418138.D Vial: 7
 Acq On : 3 Mar 2017 11:48 Operator: TMB
 Sample : WG604846-02 0.3ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:35 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	620662	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	472545	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	246385	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	0.00	111	0	0.0000	ug/L	
Spiked Amount	25.000	Range 86 - 118	Recovery	=	0.00%#	
43) 1,2-Dichloroethane-d4	0.00	65	0	0.0000	ug/L	
Spiked Amount	25.000	Range 80 - 120	Recovery	=	0.00%#	
58) Toluene-d8	0.00	98	0	0.0000	ug/L	
Spiked Amount	25.000	Range 88 - 110	Recovery	=	0.00%#	
80) p-Bromofluorobenzene	0.00	95	0	0.0000	ug/L	
Spiked Amount	25.000	Range 86 - 115	Recovery	=	0.00%#	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.35	85	1859	0.2237	ug/L	# 42
3) Chloromethane	3.82	50	4704	0.3999	ug/L	# 59
4) Vinyl Chloride	4.06	62	3099	0.3020	ug/L	92
5) 1,3-Butadiene	4.12	54	2298	Below Cal		# 71
6) Bromomethane	4.96	94	714	0.7227	ug/L	69
7) Chloroethane	5.12	64	1041	0.2376	ug/L	# 45
8) Trichlorofluoromethane	5.61	101	2798	0.2637	ug/L	# 55
10) Isoprene	6.18	67	2013	0.2120	ug/L	69
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	805	0.1302	ug/L	94
14) 1,1-Dichloroethene	6.72	61	2587	0.2731	ug/L	87
16) Dimethyl Sulfide	6.98	62	1262	0.1795	ug/L	95
19) Methylene Chloride	7.50	84	1585	0.2413	ug/L	69
20) Carbon Disulfide	7.54	76	6487	0.3210	ug/L	# 82
22) Methyl Tert Butyl Ether	7.71	73	2978	0.2441	ug/L	# 53
23) trans-1,2-Dichloroethene	7.94	61	2289	0.2506	ug/L	79
24) n-Hexane	8.02	57	2204	0.2517	ug/L	89
26) Vinyl Acetate	8.53	43	1557	0.2227	ug/L	# 73
27) 1,1-Dichloroethane	8.56	63	2955	0.2561	ug/L	# 89
31) 2,2-Dichloropropane	9.34	77	2453	0.2509	ug/L	# 57
32) cis-1,2-Dichloroethene	9.41	96	1847	0.2590	ug/L	81
33) Chloroform	9.61	83	4136	0.3417	ug/L	96
35) Bromochloromethane	9.84	130	618	0.1591	ug/L	# 66
38) 1,1,1-Trichloroethane	10.15	97	2439	0.2380	ug/L	88
39) Cyclohexane	10.18	56	2312	0.2130	ug/L	# 85
40) 1,1-Dichloropropene	10.34	75	2133	0.2445	ug/L	# 39
42) Carbon Tetrachloride	10.49	117	2304	0.2447	ug/L	# 76
45) 1,2-Dichloroethane	10.66	62	1603	0.2199	ug/L	# 41
46) Benzene	10.71	78	7407	0.2944	ug/L	# 83
47) Trichloroethene	11.47	130	2073	0.2841	ug/L	95
48) Methylcyclohexane	11.55	83	2979	0.2734	ug/L	79
49) 1,2-Dichloropropane	11.67	63	1466	0.2326	ug/L	# 31
50) Bromodichloromethane	11.97	83	2161	0.2598	ug/L	# 83
52) Dibromomethane	12.06	93	465	0.1471	ug/L	92
55) cis-1,3-Dichloropropene	12.61	75	2207	0.2309	ug/L	92
56) Dimethyl Disulfide	12.87	79	787	0.1509	ug/L	97
59) Toluene	13.04	91	7102	0.2669	ug/L	98
60) Ethyl Methacrylate	13.13	69	432	0.6348	ug/L	# 17
62) trans-1,3-Dichloropropene	13.21	75	1769	0.2224	ug/L	# 43
63) 1,1,2-Trichloroethane	13.42	97	579	0.1330	ug/L	# 45
65) 1,3-Dichloropropane	13.73	76	1997	0.2705	ug/L	85

(#) = qualifier out of range (m) = manual integration
 8M418138.D 8260WT.M Mon Mar 06 12:10:38 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418138.D Vial: 7
 Acq On : 3 Mar 2017 11:48 Operator: TMB
 Sample : WG604846-02 0.3ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:35 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

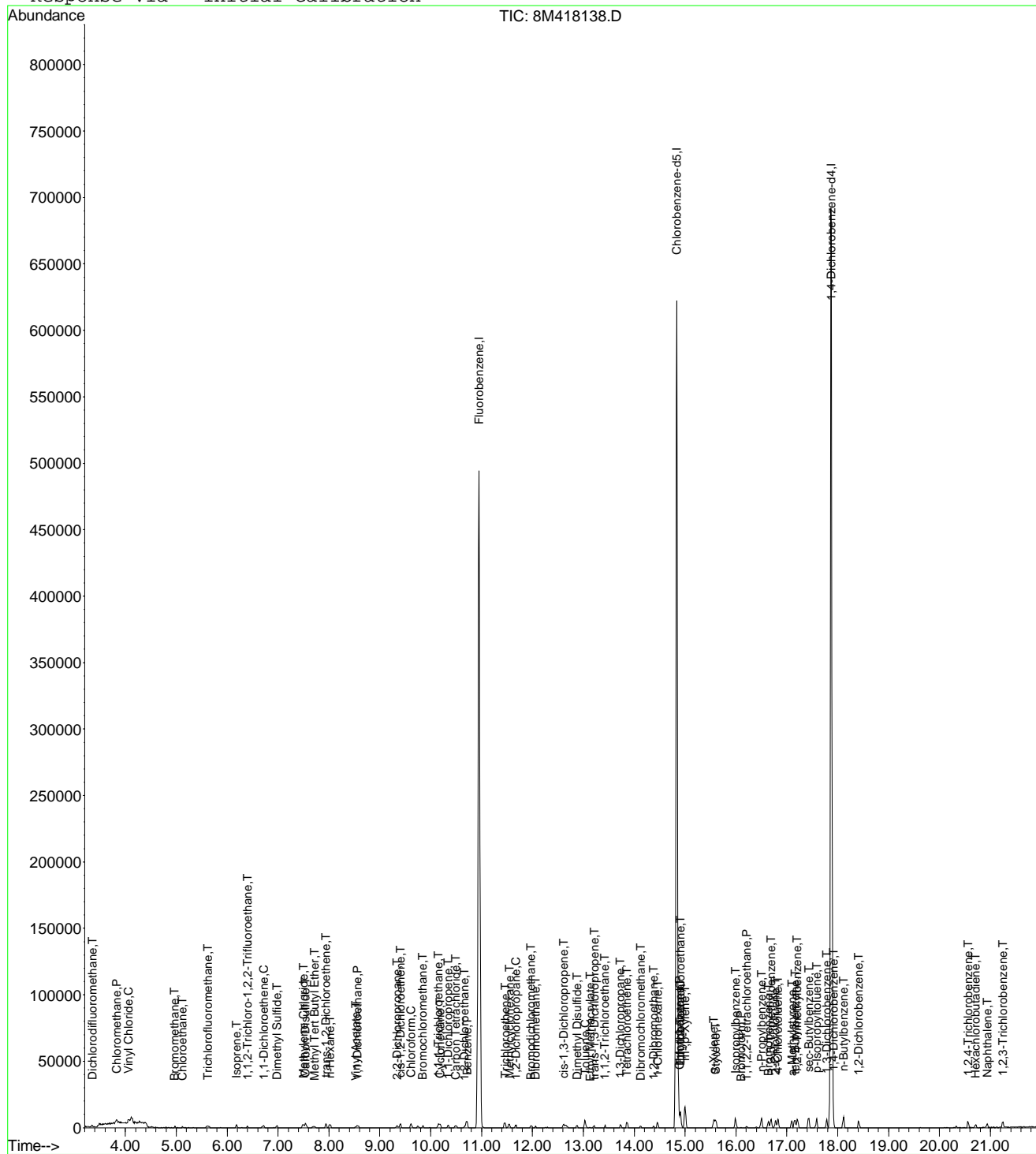
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
66) Tetrachloroethene	13.85	164	1454	0.2536	ug/L	79
67) Dibromochloromethane	14.13	129	1008	0.1774	ug/L	99
68) 1,2-Dibromoethane	14.38	107	835	0.1957	ug/L	89
69) 1-Chlorohexane	14.46	91	2191	0.2371	ug/L	99
70) Chlorobenzene	14.89	112	5567	0.2884	ug/L	79
71) 1,1,1,2-Tetrachloroethane	14.91	131	1372	0.1981	ug/L	94
72) Ethylbenzene	14.91	106	2687	0.2466	ug/L	79
73) m-,p-Xylene	15.00	106	7042	0.5641	ug/L	95
74) o-Xylene	15.56	106	3186	0.2549	ug/L	97
75) Styrene	15.60	104	4264	0.2169	ug/L	96
76) Bromoform	16.10	173	202	0.6153	ug/L #	27
77) Isopropylbenzene	15.99	105	7977	0.2605	ug/L	98
79) 1,1,2,2-Tetrachloroethane	16.21	83	928	0.2031	ug/L #	77
83) n-Propylbenzene	16.50	91	10135	0.2874	ug/L	89
84) Bromobenzene	16.64	156	2150	0.2806	ug/L	86
85) 1,3,5-Trimethylbenzene	16.69	105	7372	0.2921	ug/L	93
86) 2-Chlorotoluene	16.77	91	6834	0.2873	ug/L	99
87) 4-Chlorotoluene	16.82	91	6106	0.2942	ug/L	97
88) a-Methylstyrene	17.10	118	2933	0.1999	ug/L	82
89) tert-Butylbenzene	17.16	134	1481	0.2543	ug/L	93
90) 1,2,4-Trimethylbenzene	17.20	105	7144	0.2720	ug/L	90
91) sec-Butylbenzene	17.43	105	8781	0.2697	ug/L	93
92) p-Isopropyltoluene	17.59	119	7562	0.2767	ug/L	91
93) 1,3-Dichlorobenzene	17.78	146	4612	0.2980	ug/L	89
94) 1,4-Dichlorobenzene	17.92	146	4297	0.2795	ug/L #	43
95) n-Butylbenzene	18.11	91	7163	0.2725	ug/L #	91
96) 1,2-Dichlorobenzene	18.41	146	3936	0.2872	ug/L	94
98) 1,2,4-Trichlorobenzene	20.56	180	2860	0.2862	ug/L	90
99) Hexachlorobutadiene	20.71	225	1267	0.2700	ug/L #	75
100) Naphthalene	20.94	128	4772	0.3045	ug/L	92
101) 1,2,3-Trichlorobenzene	21.25	180	2441	0.2953	ug/L	95

(#) = qualifier out of range (m) = manual integration
 8M418138.D 8260WT.M Mon Mar 06 12:10:38 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418138.D Vial: 7
 Acq On : 3 Mar 2017 11:48 Operator: TMB
 Sample : WG604846-02 0.3ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418138.D Vial: 7
 Acq On : 3 Mar 2017 11:48 Operator: TMB
 Sample : WG604846-02 0.3ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	100	0.00
2 T	Dichlorodifluoromethane	-1.0000	0.2237	0.0	100	0.01
3 P	Chloromethane	-1.0000	0.3999	0.0	100	0.01
4 C	Vinyl Chloride	0.3000	0.3020	-0.7	100	0.01
5 T	1,3-Butadiene	-1.0000	-1.0000	0.0	0	0.03
6 T	Bromomethane	-1.0000	0.7227	0.0	0	0.00
7 T	Chloroethane	-1.0000	0.2376	0.0	100	0.00
8 T	Trichlorofluoromethane	-1.0000	0.2637	0.0	100	0.00
9 T	Diethyl ether	-1.0000	0.0000	0.0	0	-6.14#
10 T	Isoprene	-1.0000	0.2120	0.0	100	0.00
11 T	Acrolein	-1.0000	0.0000	0.0	0	-6.38#
12 T	1,1,2-Trichloro-1,2,2-Trifl	-1.0000	0.1302	0.0	100	0.01
13 T	Acetone	-1.0000	0.0000	0.0	0	-6.48#
14 C	1,1-Dichloroethene	-1.0000	0.2731	0.0	100	0.01
15 T	Tert-Butyl Alcohol	-1.0000	0.0000	0.0	0	-6.82#
16 T	Dimethyl Sulfide	-1.0000	0.1795	0.0	100	0.01
17 T	Iodomethane	-1.0000	0.0000	0.0	0	-7.22#
18 T	Methyl acetate	-1.0000	0.0000	0.0	0	-7.24#
19 T	Methylene Chloride	-1.0000	0.2413	0.0	100	0.00
20 T	Carbon Disulfide	-1.0000	0.3210	0.0	100	0.00
21 T	Acrylonitrile	-1.0000	0.0000	0.0	0	-7.67#
22 T	Methyl Tert Butyl Ether	-1.0000	0.2441	0.0	100	0.01
23 T	trans-1,2-Dichloroethene	-1.0000	0.2506	0.0	100	0.00
24 T	n-Hexane	-1.0000	0.2517	0.0	100	0.01
25 T	Diisopropyl ether	-1.0000	0.0000	0.0	0	-8.35#
26 T	Vinyl Acetate	-1.0000	0.2227	0.0	100	0.00
27 P	1,1-Dichloroethane	-1.0000	0.2561	0.0	100	0.00
28 T	Ethyl-Tert-Butyl ether	-1.0000	0.0000	0.0	0	-8.93#
29 T	2-Butanone	-1.0000	0.0000	0.0	0	-9.12#
30 T	Propionitrile	-1.0000	0.0000	0.0	0	-9.23#
31 T	2,2-Dichloropropane	-1.0000	0.2509	0.0	100	0.00
32 T	cis-1,2-Dichloroethene	-1.0000	0.2590	0.0	100	0.00
33 C	Chloroform	0.3000	0.3418	-13.9	100	0.00
34	1-Bromopropane	-1.0000	0.0000	0.0	0	-9.75#
35 T	Bromochloromethane	-1.0000	0.1591	0.0	100	0.00
36 T	Tetrahydrofuran	-1.0000	0.0000	0.0	0	-9.87#
37 S	Dibromodifluoromethane	-1.0000	0.0000	0.0	0	-9.90#
38 T	1,1,1-Trichloroethane	-1.0000	0.2380	0.0	100	0.01
39 T	Cyclohexane	-1.0000	0.2130	0.0	100	0.01
40 T	1,1-Dichloropropene	-1.0000	0.2445	0.0	100	0.00
41 T	Tert-Amyl-Methyl ether	-1.0000	0.0000	0.0	0	-10.44#
42 T	Carbon Tetrachloride	-1.0000	0.2447	0.0	100	0.00
43 S	1,2-Dichloroethane-d4	-1.0000	0.0000	0.0	0	-10.54#
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	-1.0000	0.2199	0.0	100	0.00
46 T	Benzene	-1.0000	0.2944	0.0	100	0.01
47 T	Trichloroethene	-1.0000	0.2841	0.0	100	0.01
48 T	Methylcyclohexane	-1.0000	0.2734	0.0	100	0.01
49 C	1,2-Dichloropropane	-1.0000	0.2326	0.0	100	0.00
50 T	Bromodichloromethane	-1.0000	0.2598	0.0	100	0.00
51 T	1,4-Dioxane	-1.0000	0.0000	0.0	0	-11.96#
52 T	Dibromomethane	-1.0000	0.1471	0.0	100	0.00
53 T	2-Chloroethyl Vinyl Ether	-1.0000	0.0000	0.0	0	-12.26#
54 T	4-Methyl-2-Pentanone	-1.0000	0.0000	0.0	0	-12.29#

(#) = Out of Range

8M418138.D 8260WT.M

Mon Mar 06 12:12:24 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418138.D Vial: 7
 Acq On : 3 Mar 2017 11:48 Operator: TMB
 Sample : WG604846-02 0.3ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	-1.0000	0.2309	0.0	100	0.00
56 T	Dimethyl Disulfide	-1.0000	0.1509	0.0	100	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	100	0.00
58 S	Toluene-d8	-1.0000	0.0000	0.0	0	-12.93#
59 C	Toluene	-1.0000	0.2669	0.0	100	0.00
60 T	Ethyl Methacrylate	-1.0000	0.6348	0.0	0	0.01
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	-1.0000	0.2224	0.0	100	0.01
63 T	1,1,2-Trichloroethane	-1.0000	0.1330	0.0	100	0.00
64 T	2-Hexanone	-1.0000	0.0000	0.0	0	-13.36#
65 T	1,3-Dichloropropane	-1.0000	0.2705	0.0	100	0.00
66 T	Tetrachloroethene	-1.0000	0.2536	0.0	100	0.00
67 T	Dibromochloromethane	-1.0000	0.1774	0.0	100	0.01
68 T	1,2-Dibromoethane	-1.0000	0.1957	0.0	100	0.00
69 T	1-Chlorohexane	-1.0000	0.2371	0.0	100	0.00
70 P	Chlorobenzene	-1.0000	0.2884	0.0	100	0.00
71 T	1,1,1,2-Tetrachloroethane	-1.0000	0.1981	0.0	100	0.00
72 C	Ethylbenzene	-1.0000	0.2466	0.0	100	0.00
73 T	m-,p-Xylene	-1.0000	0.5641	0.0	100	0.00
74 T	o-Xylene	-1.0000	0.2549	0.0	100	0.00
75 T	Styrene	-1.0000	0.2169	0.0	100	0.00
76 P	Bromoform	-1.0000	0.6153	0.0	0	0.00
77 T	Isopropylbenzene	-1.0000	0.2605	0.0	100	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	100	0.00
79 P	1,1,2,2-Tetrachloroethane	-1.0000	0.2031	0.0	100	0.00
80 S	p-Bromofluorobenzene	-1.0000	0.0000	0.0	0	-16.35#
81 T	1,2,3-Trichloropropane	-1.0000	0.0000	0.0	0	-16.41#
82 T	trans-1,4-Dichloro-2-Butene	-1.0000	0.0000	0.0	0	-16.45#
83 T	n-Propylbenzene	-1.0000	0.2874	0.0	100	0.00
84 T	Bromobenzene	0.3000	0.2806	6.5	100	0.00
85 T	1,3,5-Trimethylbenzene	-1.0000	0.2921	0.0	100	0.00
86 T	2-Chlorotoluene	-1.0000	0.2873	0.0	100	0.00
87 T	4-Chlorotoluene	-1.0000	0.2942	0.0	100	0.00
88 T	a-Methylstyrene	-1.0000	0.1999	0.0	100	0.00
89 T	tert-Butylbenzene	-1.0000	0.2543	0.0	100	0.00
90 T	1,2,4-Trimethylbenzene	-1.0000	0.2720	0.0	100	0.00
91 T	sec-Butylbenzene	-1.0000	0.2697	0.0	100	0.00
92 T	p-Isopropyltoluene	-1.0000	0.2767	0.0	100	0.00
93 T	1,3-Dichlorobenzene	-1.0000	0.2980	0.0	100	0.00
94 T	1,4-Dichlorobenzene	0.3000	0.2795	6.8	100	0.00
95 T	n-Butylbenzene	-1.0000	0.2725	0.0	100	0.00
96 T	1,2-Dichlorobenzene	0.3000	0.2872	4.3	100	0.00
97 T	1,2-Dibromo-3-Chloropropane	-1.0000	0.0000	0.0	0	-19.41#
98 T	1,2,4-Trichlorobenzene	-1.0000	0.2862	0.0	100	0.00
99 T	Hexachlorobutadiene	-1.0000	0.2700	0.0	100	0.00
100 T	Naphthalene	-1.0000	0.3045	0.0	100	0.00
101 T	1,2,3-Trichlorobenzene	0.3000	0.2953	1.6	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418138.D 8260WT.M Mon Mar 06 12:12:24 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418139.D Vial: 8
 Acq On : 3 Mar 2017 12:17 Operator: TMB
 Sample : WG604846-07 20ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:39 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	625349	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.83	117	481946	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.87	152	259567	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.90	111	62863	9.7879	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	39.16%#	
43) 1,2-Dichloroethane-d4	10.54	65	54777	9.7312	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	38.92%#	
58) Toluene-d8	12.93	98	220430	9.7252	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	38.92%#	
80) p-Bromofluorobenzene	16.34	95	87329	9.7205	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	38.88%#	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.34	85	179188	21.4035	ug/L	99
3) Chloromethane	3.83	50	242935	20.4964	ug/L	99
4) Vinyl Chloride	4.05	62	221352	21.4089	ug/L	99
5) 1,3-Butadiene	4.12	54	148210	31.3394	ug/L	99
6) Bromomethane	4.96	94	82002	16.8917	ug/L	99
7) Chloroethane	5.13	64	89435	20.2563	ug/L	97
8) Trichlorofluoromethane	5.62	101	214696	20.0853	ug/L	99
9) Diethyl ether	6.14	59	322324	77.6150	ug/L	98
10) Isoprene	6.18	67	180753	18.8928	ug/L	99
11) Acrolein	6.38	56	21166	37.8724	ug/L	99
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	126527	20.3140	ug/L	99
13) Acetone	6.47	43	15209	19.1603	ug/L	99
14) 1,1-Dichloroethene	6.71	61	186851	19.5761	ug/L	96
15) Tert-Butyl Alcohol	6.82	59	39471	154.3267	ug/L	97
16) Dimethyl Sulfide	6.97	62	133259	18.8129	ug/L	96
17) Iodomethane	7.23	142	89951	15.2816	ug/L	95
18) Methyl acetate	7.23	43	44765	18.7930	ug/L	96
19) Methylene Chloride	7.49	84	128331	19.3879	ug/L	95
20) Carbon Disulfide	7.54	76	401326	19.7099	ug/L	99
21) Acrylonitrile	7.67	53	47799	40.7773	ug/L	98
22) Methyl Tert Butyl Ether	7.69	73	245394	19.9601	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	180975	19.6643	ug/L	95
24) n-Hexane	8.01	57	170579	19.3348	ug/L	97
25) Diisopropyl ether	8.36	45	1494003	79.6170	ug/L	98
26) Vinyl Acetate	8.52	43	134114	19.0365	ug/L	99
27) 1,1-Dichloroethane	8.56	63	230391	19.8213	ug/L	100
28) Ethyl-Tert-Butyl ether	8.92	59	1370167	79.3594	ug/L	100
29) 2-Butanone	9.11	43	25724	19.5828	ug/L	98
30) Propionitrile	9.22	54	33136	79.1029	ug/L	100
31) 2,2-Dichloropropane	9.34	77	190585	19.3452	ug/L	99
32) cis-1,2-Dichloroethene	9.40	96	143700	19.9979	ug/L	91
33) Chloroform	9.61	83	227459	18.6535	ug/L	99
34) 1-Bromopropane	9.75	122	27337	19.5901	ug/L	99
35) Bromochloromethane	9.84	130	80017	20.4488	ug/L	96
36) Tetrahydrofuran	9.87	42	61601	73.8967	ug/L	96
38) 1,1,1-Trichloroethane	10.14	97	202401	19.6040	ug/L	99
39) Cyclohexane	10.18	56	210315	19.2306	ug/L	99
40) 1,1-Dichloropropene	10.34	75	174389	19.8371	ug/L	99
41) Tert-Amyl-Methyl ether	10.44	73	1122293	78.3608	ug/L	99
42) Carbon Tetrachloride	10.49	117	190649	20.0941	ug/L	98

(#) = qualifier out of range (m) = manual integration
 8M418139.D 8260WT.M Mon Mar 06 12:10:42 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418139.D Vial: 8
 Acq On : 3 Mar 2017 12:17 Operator: TMB
 Sample : WG604846-07 20ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:39 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

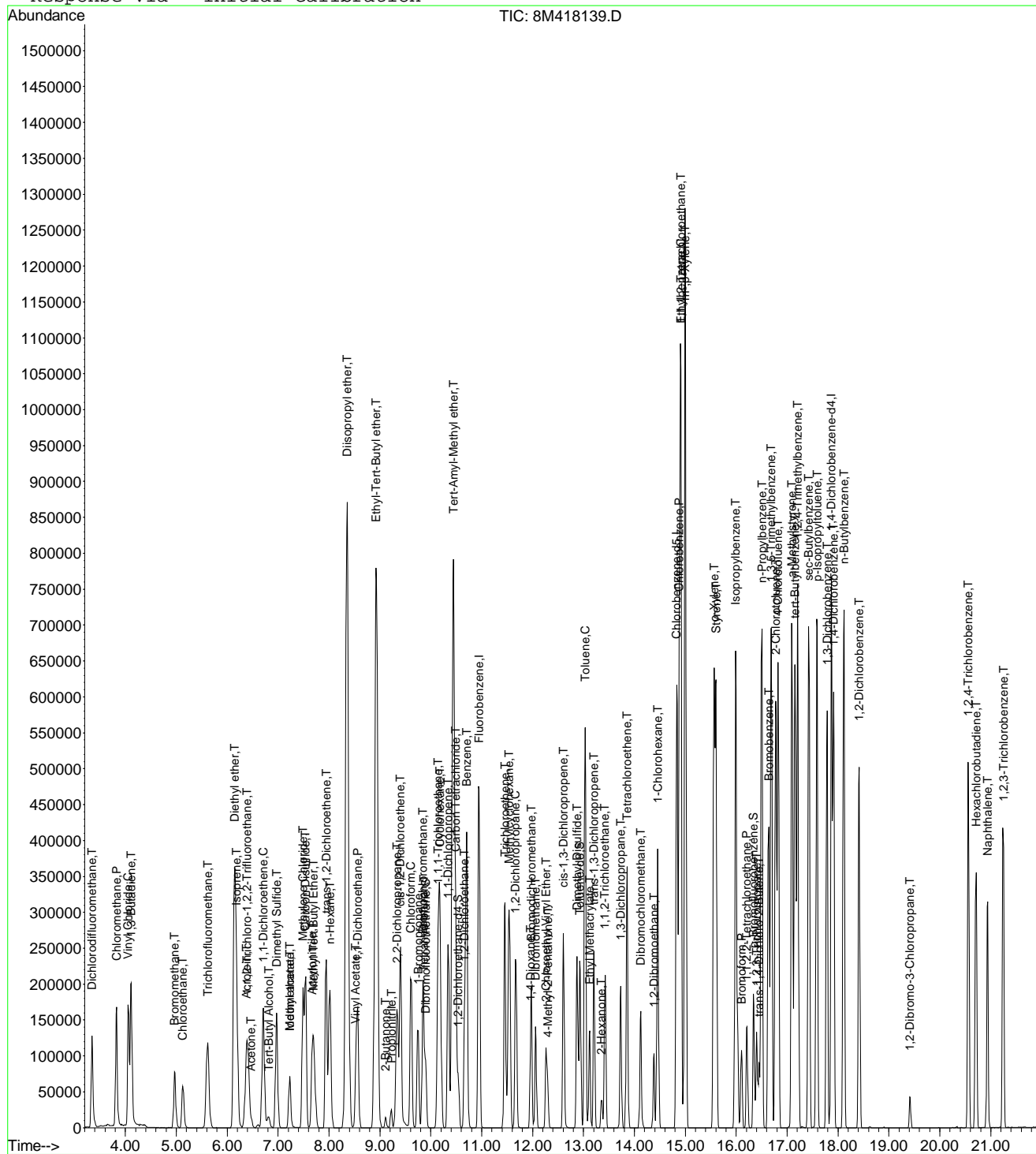
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	145981	19.8778	ug/L	99
46) Benzene	10.70	78	509608	20.0999	ug/L	98
47) Trichloroethene	11.46	130	143922	19.5772	ug/L	98
48) Methylcyclohexane	11.54	83	210274	19.1548	ug/L	98
49) 1,2-Dichloropropane	11.66	63	123860	19.5045	ug/L	97
50) Bromodichloromethane	11.97	83	166640	19.8873	ug/L	100
51) 1,4-Dioxane	11.95	88	3943	128.3631	ug/L	90
52) Dibromomethane	12.06	93	64713	20.3202	ug/L	95
53) 2-Chloroethyl Vinyl Ether	12.26	63	55316	19.5252	ug/L	100
54) 4-Methyl-2-Pentanone	12.30	58	24387	19.3725	ug/L	95
55) cis-1,3-Dichloropropene	12.61	75	191531	19.8878	ug/L	99
56) Dimethyl Disulfide	12.87	79	93135	17.7262	ug/L	98
59) Toluene	13.03	91	553136	20.3852	ug/L	99
60) Ethyl Methacrylate	13.12	69	105627	18.4105	ug/L	94
62) trans-1,3-Dichloropropene	13.21	75	160880	19.8357	ug/L	99
63) 1,1,2-Trichloroethane	13.42	97	88215	19.8654	ug/L	99
64) 2-Hexanone	13.35	58	20904	18.2922	ug/L	96
65) 1,3-Dichloropropane	13.73	76	150819	20.0326	ug/L	93
66) Tetrachloroethene	13.86	164	111955	19.1472	ug/L	96
67) Dibromochloromethane	14.13	129	116657	20.1277	ug/L	100
68) 1,2-Dibromoethane	14.38	107	89287	20.5178	ug/L	99
69) 1-Chlorohexane	14.46	91	186028	19.7388	ug/L	97
70) Chlorobenzene	14.88	112	379891	19.2955	ug/L	95
71) 1,1,1,2-Tetrachloroethane	14.91	131	135967	19.2472	ug/L	98
72) Ethylbenzene	14.91	106	208051	18.7204	ug/L	94
73) m-,p-Xylene	14.99	106	505631	39.7114	ug/L	94
74) o-Xylene	15.56	106	243652	19.1121	ug/L	99
75) Styrene	15.60	104	415687	20.7282	ug/L	94
76) Bromoform	16.10	173	67672	18.0088	ug/L	99
77) Isopropylbenzene	15.99	105	642905	20.5893	ug/L	98
79) 1,1,2,2-Tetrachloroethane	16.20	83	98243	20.4122	ug/L	99
81) 1,2,3-Trichloropropane	16.40	110	28295	20.2458	ug/L #	44
82) trans-1,4-Dichloro-2-Butene	16.44	53	27881	19.3697	ug/L #	38
83) n-Propylbenzene	16.50	91	787128	21.1891	ug/L	98
84) Bromobenzene	16.64	156	163699	20.2819	ug/L	94
85) 1,3,5-Trimethylbenzene	16.69	105	552747	20.7879	ug/L	98
86) 2-Chlorotoluene	16.77	91	532493	21.2490	ug/L	100
87) 4-Chlorotoluene	16.82	91	426829	19.5226	ug/L	98
88) a-Methylstyrene	17.09	118	296748	19.1944	ug/L	100
89) tert-Butylbenzene	17.15	134	119436	19.4679	ug/L	97
90) 1,2,4-Trimethylbenzene	17.21	105	580072	20.9650	ug/L	98
91) sec-Butylbenzene	17.42	105	719061	20.9650	ug/L	99
92) p-Isopropyltoluene	17.59	119	604719	21.0070	ug/L	100
93) 1,3-Dichlorobenzene	17.79	146	325988	19.9946	ug/L	97
94) 1,4-Dichlorobenzene	17.91	146	322576	19.9163	ug/L	98
95) n-Butylbenzene	18.12	91	580833	20.9719	ug/L	99
96) 1,2-Dichlorobenzene	18.42	146	287792	19.9299	ug/L	95
97) 1,2-Dibromo-3-Chloropropane	19.41	75	15556	19.3796	ug/L	91
98) 1,2,4-Trichlorobenzene	20.56	180	207189	19.6836	ug/L	99
99) Hexachlorobutadiene	20.71	225	97044	19.6264	ug/L	98
100) Naphthalene	20.94	128	342472	20.7422	ug/L	99
101) 1,2,3-Trichlorobenzene	21.25	180	174953	20.0894	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418139.D 8260WT.M Mon Mar 06 12:10:42 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418139.D Vial: 8
Acq On : 3 Mar 2017 12:17 Operator: TMB
Sample : WG604846-07 20ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418140.D Vial: 9
 Acq On : 3 Mar 2017 12:46 Operator: TMB
 Sample : WG604846-08 50ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:43 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	654600	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	509436	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	278577	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.90	111	174359	25.9349	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	103.72%	
43) 1,2-Dichloroethane-d4	10.55	65	157445	26.7206	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	106.88%	
58) Toluene-d8	12.93	98	624421	26.0625	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	104.24%	
80) p-Bromofluorobenzene	16.35	95	250283	25.9576	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	103.84%	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.34	85	480133	54.7877	ug/L	99
3) Chloromethane	3.83	50	623131	50.2243	ug/L	100
4) Vinyl Chloride	4.05	62	548074	50.6403	ug/L	100
5) 1,3-Butadiene	4.10	54	257929	56.3764	ug/L	99
6) Bromomethane	4.97	94	247927	47.1579	ug/L	100
7) Chloroethane	5.13	64	244486	52.8997	ug/L	98
8) Trichlorofluoromethane	5.61	101	576981	51.5659	ug/L	100
9) Diethyl ether	6.14	59	453533	104.3298	ug/L	99
10) Isoprene	6.18	67	501570	50.0828	ug/L	98
11) Acrolein	6.38	56	30544	52.2103	ug/L	99
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	339297	52.0401	ug/L	97
13) Acetone	6.48	43	47292	56.9162	ug/L	97
14) 1,1-Dichloroethene	6.71	61	517664	51.8115	ug/L	97
15) Tert-Butyl Alcohol	6.81	59	58992	220.3446	ug/L	99
16) Dimethyl Sulfide	6.97	62	375346	50.6219	ug/L	95
17) Iodomethane	7.23	142	302381	46.1847	ug/L	95
18) Methyl acetate	7.24	43	128982	51.7288	ug/L	96
19) Methylene Chloride	7.50	84	349699	50.4707	ug/L	96
20) Carbon Disulfide	7.54	76	1100541	51.6344	ug/L	100
21) Acrylonitrile	7.67	53	70942	57.8162	ug/L	99
22) Methyl Tert Butyl Ether	7.70	73	711461	55.2837	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	496567	51.5447	ug/L	95
24) n-Hexane	8.01	57	462079	50.0354	ug/L	98
25) Diisopropyl ether	8.35	45	2050534	104.3921	ug/L	98
26) Vinyl Acetate	8.53	43	386537	52.4145	ug/L	98
27) 1,1-Dichloroethane	8.56	63	640892	52.6743	ug/L	100
28) Ethyl-Tert-Butyl ether	8.93	59	1907573	105.5486	ug/L	100
29) 2-Butanone	9.11	43	73659	53.5685	ug/L	97
30) Propionitrile	9.22	54	47636	108.6361	ug/L	98
31) 2,2-Dichloropropane	9.34	77	528126	51.2116	ug/L	100
32) cis-1,2-Dichloroethene	9.41	96	400499	53.2445	ug/L	92
33) Chloroform	9.62	83	632846	49.5794	ug/L	100
34) 1-Bromopropane	9.75	122	78357	53.6426	ug/L	100
35) Bromochloromethane	9.84	130	223465	54.5559	ug/L	97
36) Tetrahydrofuran	9.86	42	94064	107.7971	ug/L	99
38) 1,1,1-Trichloroethane	10.14	97	571157	52.8485	ug/L	99
39) Cyclohexane	10.18	56	580131	50.6753	ug/L	99
40) 1,1-Dichloropropene	10.34	75	479419	52.0980	ug/L	97
41) Tert-Amyl-Methyl ether	10.44	73	1596344	106.4795	ug/L	99
42) Carbon Tetrachloride	10.49	117	531498	53.5159	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418140.D 8260WT.M Mon Mar 06 12:10:46 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418140.D Vial: 9
 Acq On : 3 Mar 2017 12:46 Operator: TMB
 Sample : WG604846-08 50ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:10:43 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

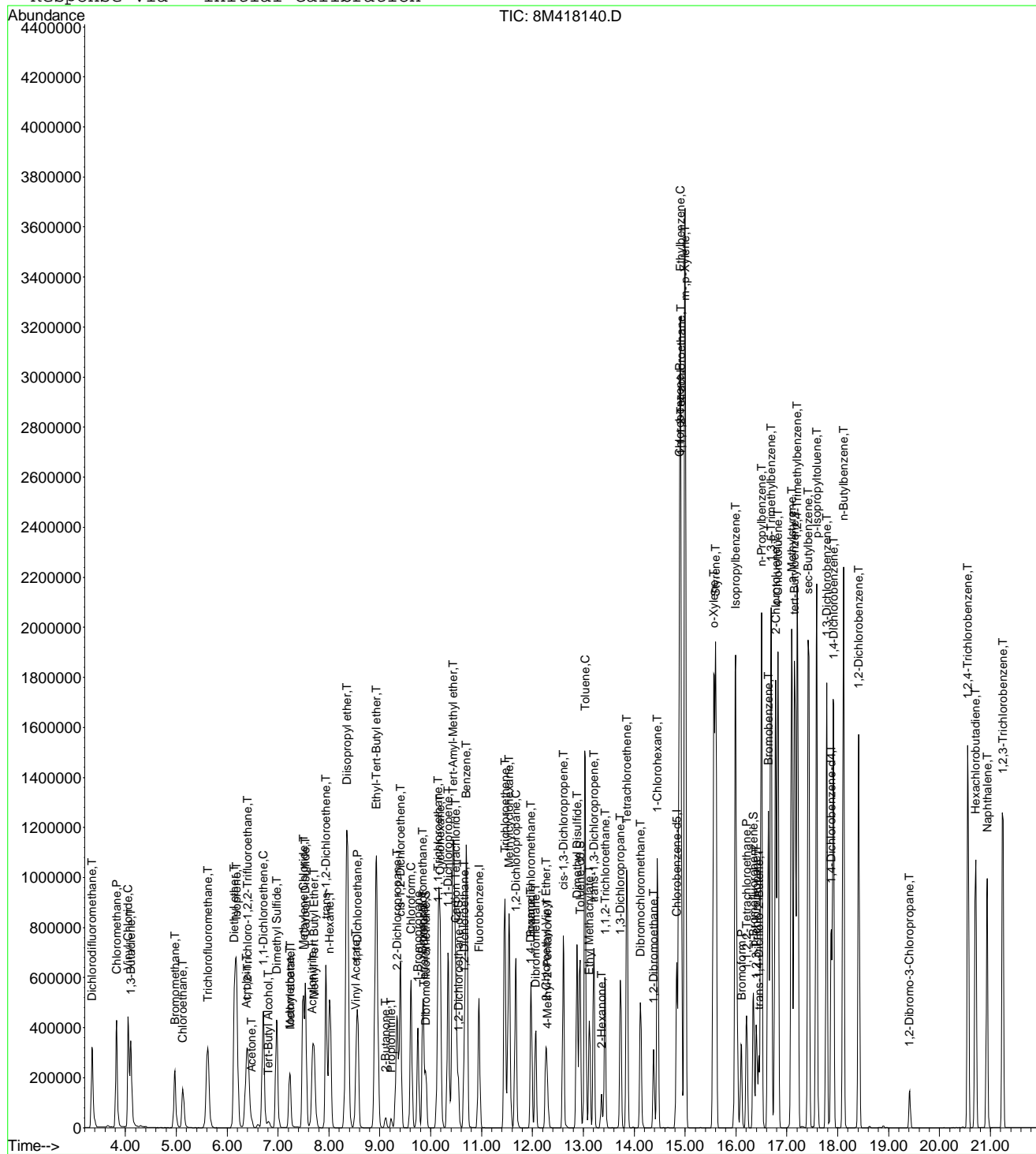
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	416996	54.2439	ug/L	99
46) Benzene	10.70	78	1400829	52.7824	ug/L	99
47) Trichloroethene	11.46	130	399362	51.8964	ug/L	99
48) Methylcyclohexane	11.54	83	578020	50.3015	ug/L	98
49) 1,2-Dichloropropane	11.67	63	355890	53.5386	ug/L	95
50) Bromodichloromethane	11.97	83	481214	54.8633	ug/L	100
51) 1,4-Dioxane	11.96	88	6771	210.5779	ug/L	99
52) Dibromomethane	12.06	93	185682	55.6997	ug/L	97
53) 2-Chloroethyl Vinyl Ether	12.26	63	163447	55.1148	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	73364	55.6745	ug/L	95
55) cis-1,3-Dichloropropene	12.60	75	552509	54.8065	ug/L	100
56) Dimethyl Disulfide	12.87	79	282388	51.3448	ug/L	99
59) Toluene	13.04	91	1546928	53.9339	ug/L	99
60) Ethyl Methacrylate	13.12	69	317353	51.2965	ug/L	94
62) trans-1,3-Dichloropropene	13.20	75	474813	55.3831	ug/L	99
63) 1,1,2-Trichloroethane	13.43	97	261417	55.6925	ug/L	99
64) 2-Hexanone	13.36	58	69014	57.1324	ug/L	95
65) 1,3-Dichloropropane	13.73	76	446017	56.0455	ug/L	91
66) Tetrachloroethene	13.85	164	317016	51.2924	ug/L	96
67) Dibromochloromethane	14.12	129	352801	57.5867	ug/L	100
68) 1,2-Dibromoethane	14.38	107	261599	56.8707	ug/L	100
69) 1-Chlorohexane	14.45	91	520866	52.2849	ug/L	97
70) Chlorobenzene	14.89	112	1100895	52.8996	ug/L	95
71) 1,1,1,2-Tetrachloroethane	14.92	131	413367	55.3579	ug/L	99
72) Ethylbenzene	14.91	106	616755	52.5010	ug/L	99
73) m-,p-Xylene	15.00	106	1477319	109.7653	ug/L	98
74) o-Xylene	15.56	106	716424	53.1641	ug/L	99
75) Styrene	15.60	104	1232990	58.1652	ug/L	95
76) Bromoform	16.11	173	217775	53.6775	ug/L	99
77) Isopropylbenzene	15.99	105	1853309	56.1502	ug/L	99
79) 1,1,2,2-Tetrachloroethane	16.21	83	305902	59.2207	ug/L	99
81) 1,2,3-Trichloropropane	16.40	110	86372	57.5841	ug/L	46
82) trans-1,4-Dichloro-2-Butene	16.45	53	82816	52.4951	ug/L #	41
83) n-Propylbenzene	16.50	91	2226286	55.8410	ug/L	99
84) Bromobenzene	16.64	156	476720	55.0339	ug/L	95
85) 1,3,5-Trimethylbenzene	16.69	105	1600812	56.0956	ug/L	100
86) 2-Chlorotoluene	16.78	91	1467323	54.5576	ug/L	99
87) 4-Chlorotoluene	16.82	91	1307214	55.7103	ug/L	99
88) a-Methylstyrene	17.09	118	851235	51.3028	ug/L	100
89) tert-Butylbenzene	17.15	134	347940	52.8436	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	1678468	56.5236	ug/L	98
91) sec-Butylbenzene	17.42	105	2055207	55.8329	ug/L	100
92) p-Isopropyltoluene	17.59	119	1743785	56.4427	ug/L	99
93) 1,3-Dichlorobenzene	17.78	146	959892	54.8577	ug/L	97
94) 1,4-Dichlorobenzene	17.92	146	951263	54.7244	ug/L	97
95) n-Butylbenzene	18.11	91	1662268	55.9233	ug/L	100
96) 1,2-Dichlorobenzene	18.41	146	852399	55.0013	ug/L	97
97) 1,2-Dibromo-3-Chloropropane	19.41	75	51518	58.4317	ug/L	92
98) 1,2,4-Trichlorobenzene	20.55	180	628718	55.6542	ug/L	100
99) Hexachlorobutadiene	20.71	225	288135	54.2967	ug/L	98
100) Naphthalene	20.94	128	1057116	59.6563	ug/L	100
101) 1,2,3-Trichlorobenzene	21.25	180	533260	57.0543	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418140.D 8260WT.M Mon Mar 06 12:10:46 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418140.D Vial: 9
Acq On : 3 Mar 2017 12:46 Operator: TMB
Sample : WG604846-08 50ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418141.D Vial: 10
 Acq On : 3 Mar 2017 13:15 Operator: TMB
 Sample : WG604846-09 100ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:47 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	680155	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	525620	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	288376	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.90	111	360624	51.6253	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	206.52%#	
43) 1,2-Dichloroethane-d4	10.54	65	315876	51.5943	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	206.36%#	
58) Toluene-d8	12.93	98	1304802	52.7838	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	211.12%#	
80) p-Bromofluorobenzene	16.35	95	522284	52.3270	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	209.32%#	

Target Compounds

					Qvalue
2) Dichlorodifluoromethane	3.34	85	986346	108.3227	ug/L 100
3) Chloromethane	3.82	50	1245720	96.6326	ug/L 99
4) Vinyl Chloride	4.05	62	1045412	92.9635	ug/L 99
5) 1,3-Butadiene	4.09	54	347391	77.0793	ug/L 98
6) Bromomethane	4.97	94	566277	100.9348	ug/L 100
7) Chloroethane	5.13	64	517135	107.6889	ug/L 98
8) Trichlorofluoromethane	5.61	101	1207796	103.8874	ug/L 99
9) Diethyl ether	6.14	59	939593	208.0210	ug/L 100
10) Isoprene	6.18	67	1098152	105.5328	ug/L 99
11) Acrolein	6.38	56	64546	106.1860	ug/L 97
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	717051	105.8465	ug/L 98
13) Acetone	6.48	43	87951	101.8726	ug/L 98
14) 1,1-Dichloroethene	6.71	61	1089237	104.9225	ug/L 97
15) Tert-Butyl Alcohol	6.81	59	108947	391.6451	ug/L 99
16) Dimethyl Sulfide	6.97	62	802910	104.2177	ug/L 95
17) Iodomethane	7.23	142	707463	102.7248	ug/L 94
18) Methyl acetate	7.23	43	266122	102.7193	ug/L 96
19) Methylene Chloride	7.48	84	731105	101.5529	ug/L 96
20) Carbon Disulfide	7.54	76	2341682	105.7374	ug/L 100
21) Acrylonitrile	7.67	53	145753	114.3224	ug/L 100
22) Methyl Tert Butyl Ether	7.69	73	1397381	104.5030	ug/L 100
23) trans-1,2-Dichloroethene	7.94	61	1051340	105.0309	ug/L 97
24) n-Hexane	8.01	57	985563	102.7102	ug/L 98
25) Diisopropyl ether	8.35	45	4273368	209.3818	ug/L 98
26) Vinyl Acetate	8.53	43	791371	103.2781	ug/L 98
27) 1,1-Dichloroethane	8.56	63	1350217	106.8036	ug/L 99
28) Ethyl-Tert-Butyl ether	8.93	59	3922361	208.8753	ug/L 99
29) 2-Butanone	9.11	43	143250	100.2643	ug/L 96
30) Propionitrile	9.22	54	97258	213.4678	ug/L 98
31) 2,2-Dichloropropane	9.34	77	1097298	102.4056	ug/L 100
32) cis-1,2-Dichloroethene	9.41	96	840915	107.5954	ug/L 91
33) Chloroform	9.61	83	1307650	98.5968	ug/L 99
34) 1-Bromopropane	9.75	122	164152	108.1550	ug/L 99
35) Bromochloromethane	9.84	130	455925	107.1258	ug/L 97
36) Tetrahydrofuran	9.86	42	185295	204.3691	ug/L 99
38) 1,1,1-Trichloroethane	10.14	97	1205474	107.3503	ug/L 99
39) Cyclohexane	10.17	56	1257411	105.7099	ug/L 100
40) 1,1-Dichloropropene	10.34	75	1017064	106.3708	ug/L 98
41) Tert-Amyl-Methyl ether	10.44	73	3254784	208.9439	ug/L 100
42) Carbon Tetrachloride	10.49	117	1122009	108.7290	ug/L 99

(#) = qualifier out of range (m) = manual integration
 8M418141.D 8260WT.M Mon Mar 06 12:10:50 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418141.D Vial: 10

Acq On : 3 Mar 2017 13:15

Operator: TMB

Sample : WG604846-09 100ug/L STD 8260

Inst : HPMS8

Misc : 1,1 STD80732

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:47 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)

Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8

Last Update : Fri Mar 03 15:26:23 2017

Response via : Initial Calibration

DataAcq Meth : 8260WT

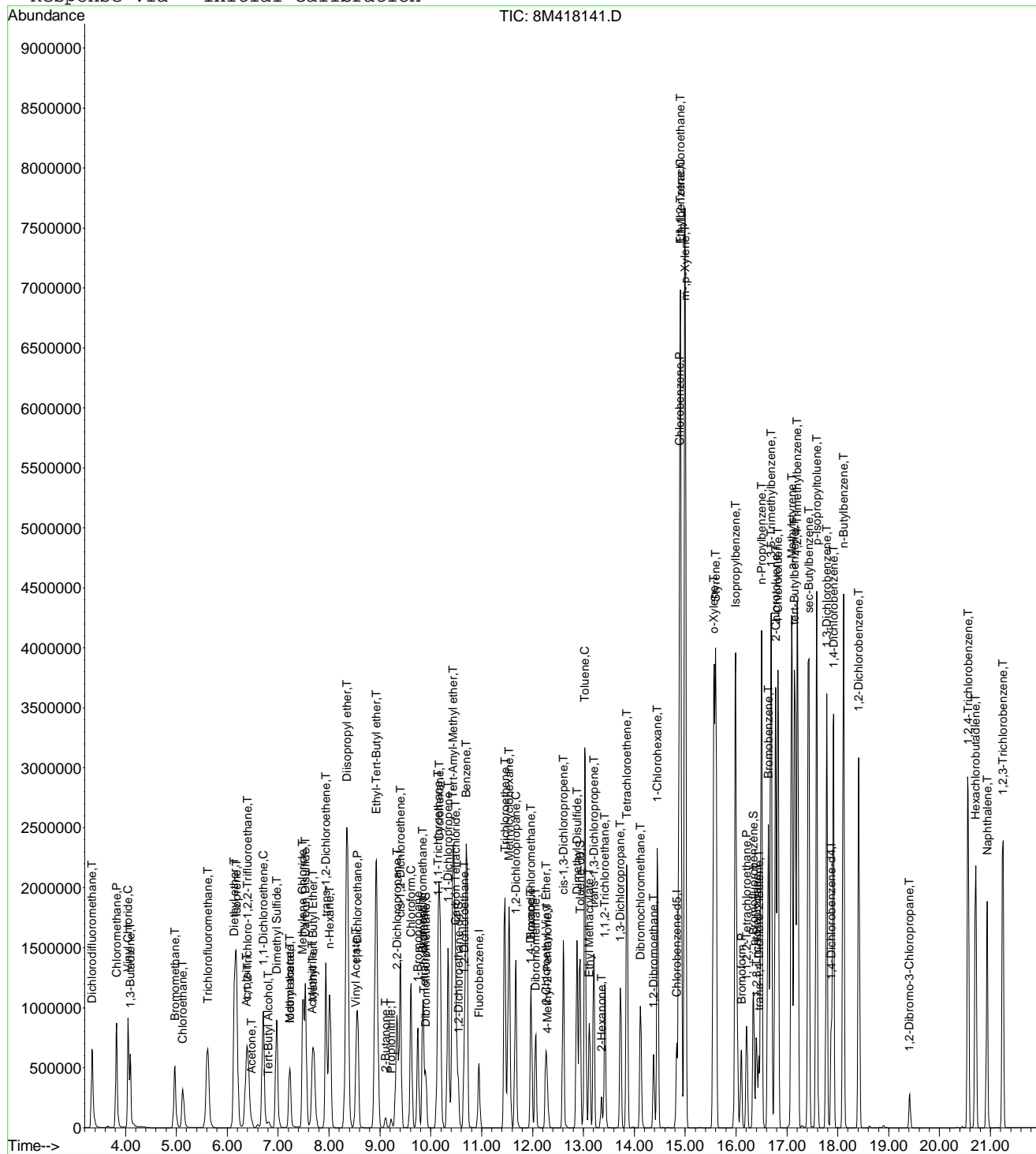
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	835801	104.6382	ug/L	98
46) Benzene	10.70	78	2879451	104.4196	ug/L	100
47) Trichloroethene	11.45	130	834969	104.4260	ug/L	98
48) Methylcyclohexane	11.54	83	1231638	103.1548	ug/L	99
49) 1,2-Dichloropropane	11.67	63	734772	106.3829	ug/L	95
50) Bromodichloromethane	11.97	83	975329	107.0194	ug/L	100
51) 1,4-Dioxane	11.96	88	14168	424.0692	ug/L	97
52) Dibromomethane	12.05	93	370879	107.0738	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	321051	104.1917	ug/L	99
54) 4-Methyl-2-Pentanone	12.29	58	140345	102.5035	ug/L	95
55) cis-1,3-Dichloropropene	12.60	75	1133255	108.1904	ug/L	100
56) Dimethyl Disulfide	12.87	79	619899	108.4774	ug/L	98
59) Toluene	13.03	91	3167244	107.0265	ug/L	99
60) Ethyl Methacrylate	13.12	69	648897	101.1072	ug/L	94
62) trans-1,3-Dichloropropene	13.20	75	956963	108.1851	ug/L	100
63) 1,1,2-Trichloroethane	13.42	97	511602	105.6362	ug/L	100
64) 2-Hexanone	13.36	58	132667	106.4451	ug/L	94
65) 1,3-Dichloropropane	13.73	76	873003	106.3220	ug/L	92
66) Tetrachloroethene	13.85	164	666772	104.5603	ug/L	96
67) Dibromochloromethane	14.12	129	706377	111.7497	ug/L	100
68) 1,2-Dibromoethane	14.38	107	514556	108.4183	ug/L	100
69) 1-Chlorohexane	14.45	91	1120054	108.9700	ug/L	98
70) Chlorobenzene	14.89	112	2310067	107.5843	ug/L	96
71) 1,1,1,2-Tetrachloroethane	14.91	131	872561	113.2550	ug/L	98
72) Ethylbenzene	14.91	106	1343562	110.8485	ug/L	94
73) m-,p-Xylene	15.00	106	3143236	226.3526	ug/L	91
74) o-Xylene	15.56	106	1502880	108.0912	ug/L	96
75) Styrene	15.60	104	2526192	115.5016	ug/L	97
76) Bromoform	16.11	173	421383	100.1730	ug/L	100
77) Isopropylbenzene	15.99	105	3708367	108.8940	ug/L	98
79) 1,1,2,2-Tetrachloroethane	16.21	83	570358	106.6658	ug/L	99
81) 1,2,3-Trichloropropane	16.41	110	161700	104.1420	ug/L #	44
82) trans-1,4-Dichloro-2-Butene	16.45	53	166563	101.3988	ug/L #	34
83) n-Propylbenzene	16.50	91	4355883	105.5442	ug/L	98
84) Bromobenzene	16.63	156	952802	106.2565	ug/L	94
85) 1,3,5-Trimethylbenzene	16.69	105	3206711	108.5512	ug/L	98
86) 2-Chlorotoluene	16.78	91	2923663	105.0129	ug/L	97
87) 4-Chlorotoluene	16.82	91	2644508	108.8729	ug/L	97
88) a-Methylstyrene	17.09	118	1844130	107.3666	ug/L	99
89) tert-Butylbenzene	17.15	134	724614	106.3117	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	3348133	108.9196	ug/L	98
91) sec-Butylbenzene	17.43	105	4065049	106.6808	ug/L	98
92) p-Isopropyltoluene	17.59	119	3486388	109.0126	ug/L	97
93) 1,3-Dichlorobenzene	17.78	146	1910507	105.4752	ug/L	99
94) 1,4-Dichlorobenzene	17.92	146	1866891	103.7494	ug/L	98
95) n-Butylbenzene	18.11	91	3290008	106.9239	ug/L	98
96) 1,2-Dichlorobenzene	18.41	146	1666206	103.8592	ug/L	98
97) 1,2-Dibromo-3-Chloropropane	19.41	75	92542	100.9118	ug/L	90
98) 1,2,4-Trichlorobenzene	20.56	180	1226320	104.8653	ug/L	99
99) Hexachlorobutadiene	20.71	225	585172	106.5239	ug/L	99
100) Naphthalene	20.94	128	1903082	103.7474	ug/L	99
101) 1,2,3-Trichlorobenzene	21.25	180	1006584	104.0365	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418141.D 8260WT.M Mon Mar 06 12:10:50 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418141.D Vial: 10
Acq On : 3 Mar 2017 13:15 Operator: TMB
Sample : WG604846-09 100ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418142.D Vial: 11
 Acq On : 3 Mar 2017 13:45 Operator: TMB
 Sample : WG604846-10 200ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:52 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	690149	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	546984	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	305633	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.91	111	731370	103.1835	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	412.72%#	
43) 1,2-Dichloroethane-d4	10.55	65	628089	101.1046	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	404.40%#	
58) Toluene-d8	12.93	98	2654554	103.1916	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	412.76%#	
80) p-Bromofluorobenzene	16.35	95	1109664	104.8986	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	419.60%#	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.35	85	1965569	212.7371	ug/L	99
3) Chloromethane	3.83	50	2414921	184.6167	ug/L	97
4) Vinyl Chloride	4.05	62	1962493	171.9880	ug/L	98
5) 1,3-Butadiene	4.10	54	614196	170.5365	ug/L	97
6) Bromomethane	4.97	94	1265367	212.8032	ug/L	100
7) Chloroethane	5.13	64	1085771	222.8283	ug/L	99
8) Trichlorofluoromethane	5.61	101	2428634	205.8715	ug/L	99
10) Isoprene	6.18	67	2251574	213.2437	ug/L	99
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	1443656	210.0174	ug/L	98
13) Acetone	6.48	43	176258	201.2011	ug/L	97
14) 1,1-Dichloroethene	6.71	61	2221294	210.8713	ug/L	96
15) Tert-Butyl Alcohol	6.83	59	2184	7.7374	ug/L #	61
16) Dimethyl Sulfide	6.98	62	1677259	214.5556	ug/L	95
17) Iodomethane	7.24	142	1541539	220.9645	ug/L	94
18) Methyl acetate	7.24	43	543551	206.7649	ug/L	96
19) Methylene Chloride	7.50	84	1536403	210.3211	ug/L	95
20) Carbon Disulfide	7.55	76	4802875	213.7307	ug/L	99
21) Acrylonitrile	7.70	53	26004	20.1011	ug/L #	31
22) Methyl Tert Butyl Ether	7.70	73	2789508	205.5922	ug/L	100
23) trans-1,2-Dichloroethene	7.94	61	2173286	213.9715	ug/L	96
24) n-Hexane	8.02	57	2031144	208.6099	ug/L	98
26) Vinyl Acetate	8.53	43	1474269	189.6138	ug/L	98
27) 1,1-Dichloroethane	8.56	63	2745318	214.0129	ug/L	99
29) 2-Butanone	9.12	43	282811	195.0802	ug/L	96
31) 2,2-Dichloropropane	9.34	77	2242174	206.2213	ug/L	99
32) cis-1,2-Dichloroethene	9.41	96	1715462	216.3155	ug/L	92
33) Chloroform	9.62	83	2643567	196.4385	ug/L	99
34) 1-Bromopropane	9.75	122	341918	222.0176	ug/L	99
35) Bromochloromethane	9.85	130	905586	209.6984	ug/L	97
36) Tetrahydrofuran	9.88	42	259	0.2815	ug/L #	31
38) 1,1,1-Trichloroethane	10.15	97	2477924	217.4696	ug/L	99
39) Cyclohexane	10.18	56	2621534	217.1995	ug/L	100
40) 1,1-Dichloropropene	10.35	75	2082247	214.6206	ug/L	97
42) Carbon Tetrachloride	10.49	117	2247727	214.6632	ug/L	99
45) 1,2-Dichloroethane	10.67	62	1675417	206.7166	ug/L	99
46) Benzene	10.71	78	5635799	201.4155	ug/L	98
47) Trichloroethene	11.46	130	1750862	215.8019	ug/L	99
48) Methylcyclohexane	11.54	83	2539649	209.6259	ug/L	99
49) 1,2-Dichloropropane	11.67	63	1530582	218.3942	ug/L	95
50) Bromodichloromethane	11.97	83	2005369	216.8557	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418142.D 8260WT.M Mon Mar 06 12:10:54 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418142.D Vial: 11

Acq On : 3 Mar 2017 13:45

Operator: TMB

Sample : WG604846-10 200ug/L STD 8260

Inst : HPMS8

Misc : 1,1 STD80732

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:52 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)

Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8

Last Update : Fri Mar 03 15:26:23 2017

Response via : Initial Calibration

DataAcq Meth : 8260WT

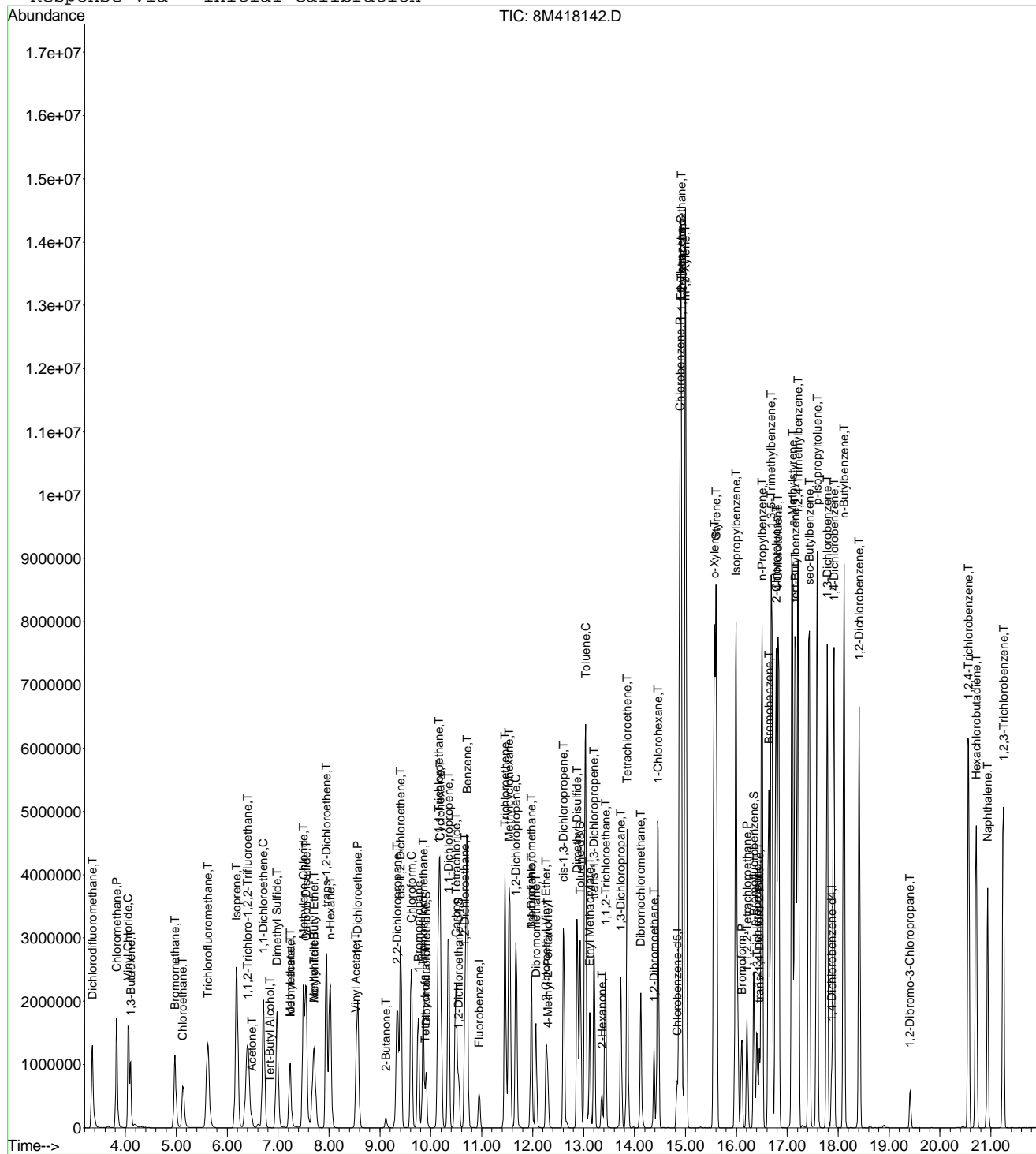
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
51) 1,4-Dioxane	11.97	88	3219	94.9542	ug/L #	21
52) Dibromomethane	12.07	93	756463	215.2305	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	665192	212.7508	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	286042	205.8906	ug/L	96
55) cis-1,3-Dichloropropene	12.60	75	2319566	218.2393	ug/L	98
56) Dimethyl Disulfide	12.87	79	1317326	227.1835	ug/L	97
59) Toluene	13.04	91	6066486	196.9900	ug/L	93
60) Ethyl Methacrylate	13.12	69	1341646	200.3294	ug/L	94
62) trans-1,3-Dichloropropene	13.20	75	1957841	212.6900	ug/L	98
63) 1,1,2-Trichloroethane	13.43	97	1048157	207.9716	ug/L	100
64) 2-Hexanone	13.36	58	270012	208.1819	ug/L	92
65) 1,3-Dichloropropane	13.73	76	1785105	208.9145	ug/L	92
66) Tetrachloroethene	13.85	164	1428416	215.2491	ug/L	96
67) Dibromochloromethane	14.12	129	1468914	223.3077	ug/L	99
68) 1,2-Dibromoethane	14.38	107	1055800	213.7711	ug/L	100
69) 1-Chlorohexane	14.47	91	2369362	221.5117	ug/L	99
70) Chlorobenzene	14.89	112	4736891	211.9897	ug/L	100
71) 1,1,1,2-Tetrachloroethane	14.92	131	1927482	240.4082	ug/L	99
72) Ethylbenzene	14.91	106	2975579	235.9071	ug/L	71
73) m-,p-Xylene	15.00	106	6212798	429.9253	ug/L	72
74) o-Xylene	15.57	106	3235931	223.6467	ug/L	85
75) Styrene	15.60	104	5094186	223.8174	ug/L	98
76) Bromoform	16.11	173	890167	202.7702	ug/L	99
77) Isopropylbenzene	16.00	105	7038008	198.5950	ug/L	90
79) 1,1,2,2-Tetrachloroethane	16.21	83	1159138	204.5369	ug/L	99
81) 1,2,3-Trichloropropane	16.41	110	334533	203.2888	ug/L #	41
82) trans-1,4-Dichloro-2-Butene	16.45	53	350831	200.8949	ug/L #	31
83) n-Propylbenzene	16.50	91	7768617	177.6073	ug/L	86
84) Bromobenzene	16.64	156	2024043	212.9763	ug/L	93
85) 1,3,5-Trimethylbenzene	16.69	105	6269102	200.2346	ug/L	90
86) 2-Chlorotoluene	16.78	91	5654405	191.6290	ug/L	91
87) 4-Chlorotoluene	16.82	91	5228350	203.0946	ug/L	89
88) a-Methylstyrene	17.10	118	3923634	215.5385	ug/L	98
89) tert-Butylbenzene	17.16	134	1605577	222.2615	ug/L	87
90) 1,2,4-Trimethylbenzene	17.22	105	6448383	197.9306	ug/L	89
91) sec-Butylbenzene	17.43	105	7557092	187.1260	ug/L	90
92) p-Isopropyltoluene	17.59	119	6646223	196.0806	ug/L	90
93) 1,3-Dichlorobenzene	17.78	146	3967757	206.6834	ug/L	98
94) 1,4-Dichlorobenzene	17.92	146	3884134	203.6665	ug/L	98
95) n-Butylbenzene	18.11	91	6244935	191.4981	ug/L	91
96) 1,2-Dichlorobenzene	18.41	146	3467912	203.9591	ug/L	99
97) 1,2-Dibromo-3-Chloropropane	19.41	75	192835	197.7685	ug/L	90
98) 1,2,4-Trichlorobenzene	20.57	180	2555191	206.1628	ug/L	100
99) Hexachlorobutadiene	20.71	225	1259967	216.4120	ug/L	99
100) Naphthalene	20.94	128	3738169	192.2816	ug/L	97
101) 1,2,3-Trichlorobenzene	21.25	180	2086433	203.4693	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418142.D 8260WT.M Mon Mar 06 12:10:54 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418142.D Vial: 11
Acq On : 3 Mar 2017 13:45 Operator: TMB
Sample : WG604846-10 200ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418143.D Vial: 12
 Acq On : 3 Mar 2017 14:14 Operator: TMB
 Sample : WG604846-11 300ug/L STD 8260 Inst : HPMS8
 Misc : 1,1 STD80732 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:56 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	739703	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	584829	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	324307	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.90	111	1109619	146.0604	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	584.24%#	
43) 1,2-Dichloroethane-d4	10.54	65	961363	144.3852	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	577.56%#	
58) Toluene-d8	12.93	98	3889999	141.4322	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	565.72%#	
80) p-Bromofluorobenzene	16.35	95	1681368	149.7907	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	599.16%#	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.34	85	2790887	281.8271	ug/L	98
3) Chloromethane	3.81	50	3289673	234.6423	ug/L	97
4) Vinyl Chloride	4.05	62	2541860	207.8390	ug/L	97
5) 1,3-Butadiene	4.09	54	805311	Below Cal		97
6) Bromomethane	4.96	94	1915851	292.1599	ug/L	99
7) Chloroethane	5.13	64	1602938	306.9264	ug/L	98
8) Trichlorofluoromethane	5.61	101	3643385	288.1541	ug/L	99
9) Diethyl ether	6.14	59	1541514	313.8090	ug/L	99
10) Isoprene	6.18	67	3401679	300.5861	ug/L	98
11) Acrolein	6.38	56	110161	166.6389	ug/L	99
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	2133911	289.6365	ug/L	97
13) Acetone	6.48	43	270277	287.8565	ug/L	91
14) 1,1-Dichloroethene	6.71	61	3223475	285.5099	ug/L	94
15) Tert-Butyl Alcohol	6.82	59	176691	584.0396	ug/L	99
16) Dimethyl Sulfide	6.97	62	2575873	307.4324	ug/L	94
17) Iodomethane	7.23	142	2130544	285.9243	ug/L	96
18) Methyl acetate	7.24	43	882724	313.2902	ug/L	95
19) Methylene Chloride	7.49	84	2316830	295.9085	ug/L	93
20) Carbon Disulfide	7.54	76	6834736	283.7742	ug/L	97
21) Acrylonitrile	7.67	53	264225	190.5629	ug/L	96
22) Methyl Tert Butyl Ether	7.70	73	4329002	297.6817	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	3170166	291.2102	ug/L	95
24) n-Hexane	8.01	57	2993698	286.8717	ug/L	98
25) Diisopropyl ether	8.35	45	6485385	292.1830	ug/L	98
26) Vinyl Acetate	8.53	43	2460491	295.2572	ug/L	97
27) 1,1-Dichloroethane	8.56	63	4030510	293.1519	ug/L	98
28) Ethyl-Tert-Butyl ether	8.93	59	6034449	295.4797	ug/L	97
29) 2-Butanone	9.12	43	478684	308.0713	ug/L	96
30) Propionitrile	9.23	54	163447	329.8637	ug/L	99
31) 2,2-Dichloropropane	9.34	77	3259874	279.7373	ug/L	98
32) cis-1,2-Dichloroethene	9.41	96	2569811	302.3384	ug/L	90
33) Chloroform	9.61	83	3868423	268.1982	ug/L	98
34) 1-Bromopropane	9.75	122	513781	311.2640	ug/L	98
35) Bromochloromethane	9.85	130	1367795	295.5099	ug/L	96
36) Tetrahydrofuran	9.87	42	311306	315.7109	ug/L	96
38) 1,1,1-Trichloroethane	10.14	97	3606317	295.2977	ug/L	99
39) Cyclohexane	10.17	56	3913070	302.4868	ug/L	99
40) 1,1-Dichloropropene	10.34	75	3046159	292.9390	ug/L	96
41) Tert-Amyl-Methyl ether	10.44	73	5138965	303.3427	ug/L	100
42) Carbon Tetrachloride	10.49	117	3328012	296.5407	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418143.D 8260WT.M Mon Mar 06 12:10:58 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418143.D Vial: 12

Acq On : 3 Mar 2017 14:14

Operator: TMB

Sample : WG604846-11 300ug/L STD 8260

Inst : HPMS8

Misc : 1,1 STD80732

Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:10:56 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)

Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8

Last Update : Fri Mar 03 15:26:23 2017

Response via : Initial Calibration

DataAcq Meth : 8260WT

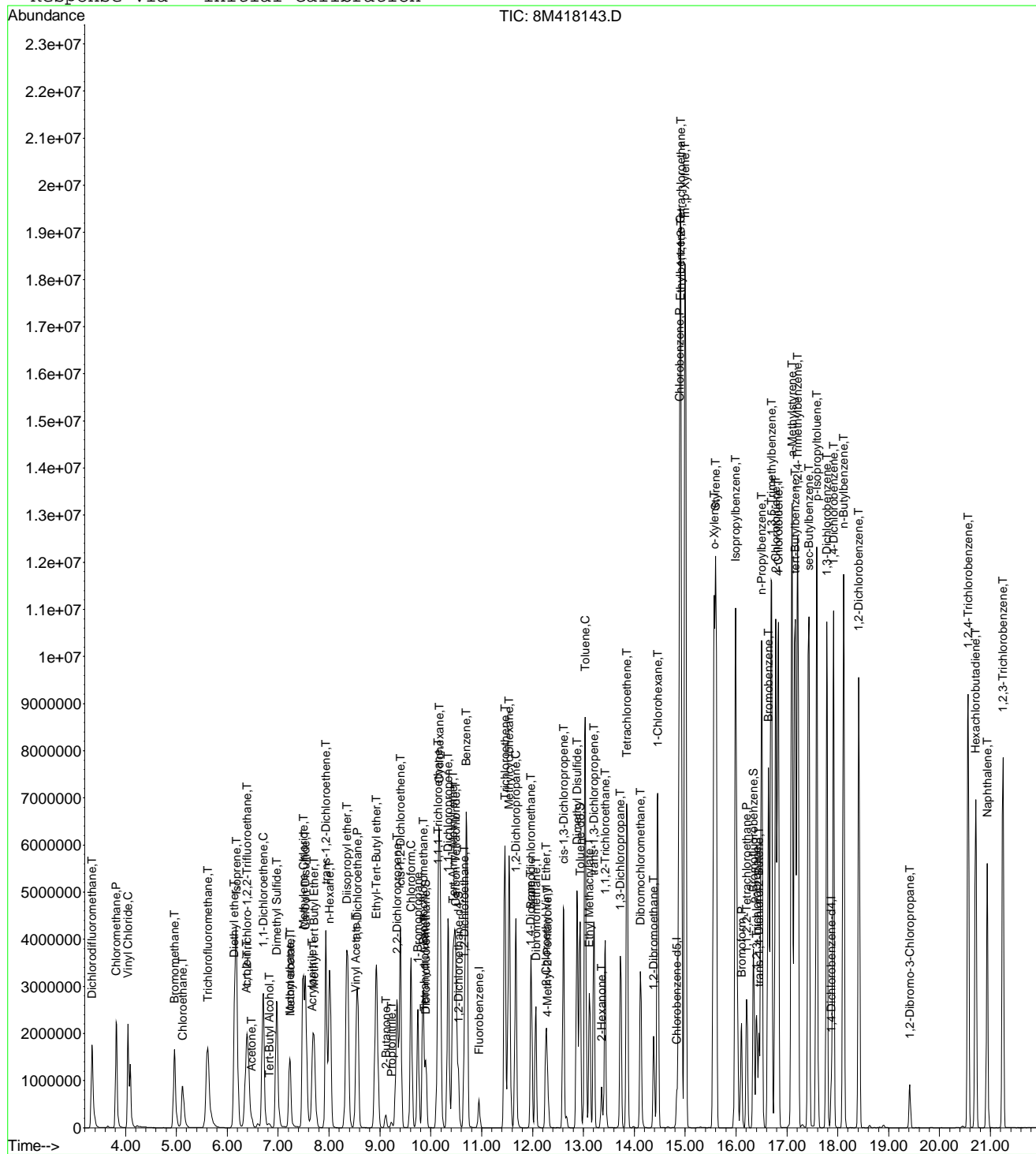
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	2525616	290.7403	ug/L	98
46) Benzene	10.70	78	7812813	260.5136	ug/L	94
47) Trichloroethene	11.45	130	2596975	298.6460	ug/L	99
48) Methylcyclohexane	11.54	83	3791241	291.9699	ug/L	98
49) 1,2-Dichloropropane	11.67	63	2334046	310.7272	ug/L	95
50) Bromodichloromethane	11.97	83	3015789	304.2726	ug/L	98
51) 1,4-Dioxane	11.96	88	25633	705.4693	ug/L	96
52) Dibromomethane	12.06	93	1173446	311.5047	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	1077432	321.5137	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	473971	318.3053	ug/L	96
55) cis-1,3-Dichloropropene	12.61	75	3483623	305.8038	ug/L	97
56) Dimethyl Disulfide	12.87	79	2062358	331.8433	ug/L	95
59) Toluene	13.04	91	8103671	246.1129	ug/L	87
60) Ethyl Methacrylate	13.12	69	2144847	299.2583	ug/L	93
62) trans-1,3-Dichloropropene	13.20	75	2994769	304.2837	ug/L	97
63) 1,1,2-Trichloroethane	13.43	97	1651717	306.5202	ug/L	99
64) 2-Hexanone	13.36	58	448671	323.5442	ug/L	91
65) 1,3-Dichloropropane	13.73	76	2745535	300.5228	ug/L	92
66) Tetrachloroethene	13.85	164	2132094	300.4960	ug/L	95
67) Dibromochloromethane	14.12	129	2273555	323.2648	ug/L	99
68) 1,2-Dibromoethane	14.38	107	1645009	311.5167	ug/L	100
69) 1-Chlorohexane	14.46	91	3483125	304.5650	ug/L	99
70) Chlorobenzene	14.89	112	6501311	272.1248	ug/L	96
71) 1,1,1,2-Tetrachloroethane	14.92	131	2824474	329.4900	ug/L	98
72) Ethylbenzene	14.91	106	4316139	320.0447	ug/L	56
73) m-,p-Xylene	15.00	106	8000424	517.8029	ug/L	65
74) o-Xylene	15.57	106	4729447	305.7168	ug/L	75
75) Styrene	15.60	104	7002885	287.7675	ug/L	92
76) Bromoform	16.11	173	1389774	295.8305	ug/L	99
77) Isopropylbenzene	15.99	105	9063037	239.1873	ug/L	81
79) 1,1,2,2-Tetrachloroethane	16.21	83	1824210	303.3579	ug/L	98
81) 1,2,3-Trichloropropane	16.41	110	531737	304.5197	ug/L #	38
82) trans-1,4-Dichloro-2-Butene	16.45	53	548820	295.8738	ug/L #	28
83) n-Propylbenzene	16.50	91	9757008	210.2217	ug/L #	76
84) Bromobenzene	16.63	156	3014604	298.9412	ug/L	91
85) 1,3,5-Trimethylbenzene	16.70	105	8201065	246.8585	ug/L	83
86) 2-Chlorotoluene	16.78	91	7321608	233.8432	ug/L	84
87) 4-Chlorotoluene	16.83	91	7020069	256.9917	ug/L	81
88) a-Methylstyrene	17.10	118	5567769	288.2449	ug/L	93
89) tert-Butylbenzene	17.16	134	2367704	308.8904	ug/L	78
90) 1,2,4-Trimethylbenzene	17.21	105	8310192	240.3903	ug/L	79
91) sec-Butylbenzene	17.43	105	9523758	222.2448	ug/L #	81
92) p-Isopropyltoluene	17.59	119	8475190	235.6422	ug/L	81
93) 1,3-Dichlorobenzene	17.78	146	5538013	271.8682	ug/L	93
94) 1,4-Dichlorobenzene	17.92	146	5403841	267.0372	ug/L	93
95) n-Butylbenzene	18.11	91	7976631	230.5154	ug/L	84
96) 1,2-Dichlorobenzene	18.41	146	4950886	274.4112	ug/L	96
97) 1,2-Dibromo-3-Chloropropane	19.42	75	304392	293.8837	ug/L	89
98) 1,2,4-Trichlorobenzene	20.56	180	3712561	282.2958	ug/L	99
99) Hexachlorobutadiene	20.71	225	1837742	297.4752	ug/L	99
100) Naphthalene	20.94	128	5353312	259.5047	ug/L	94
101) 1,2,3-Trichlorobenzene	21.25	180	3114763	286.2618	ug/L	99

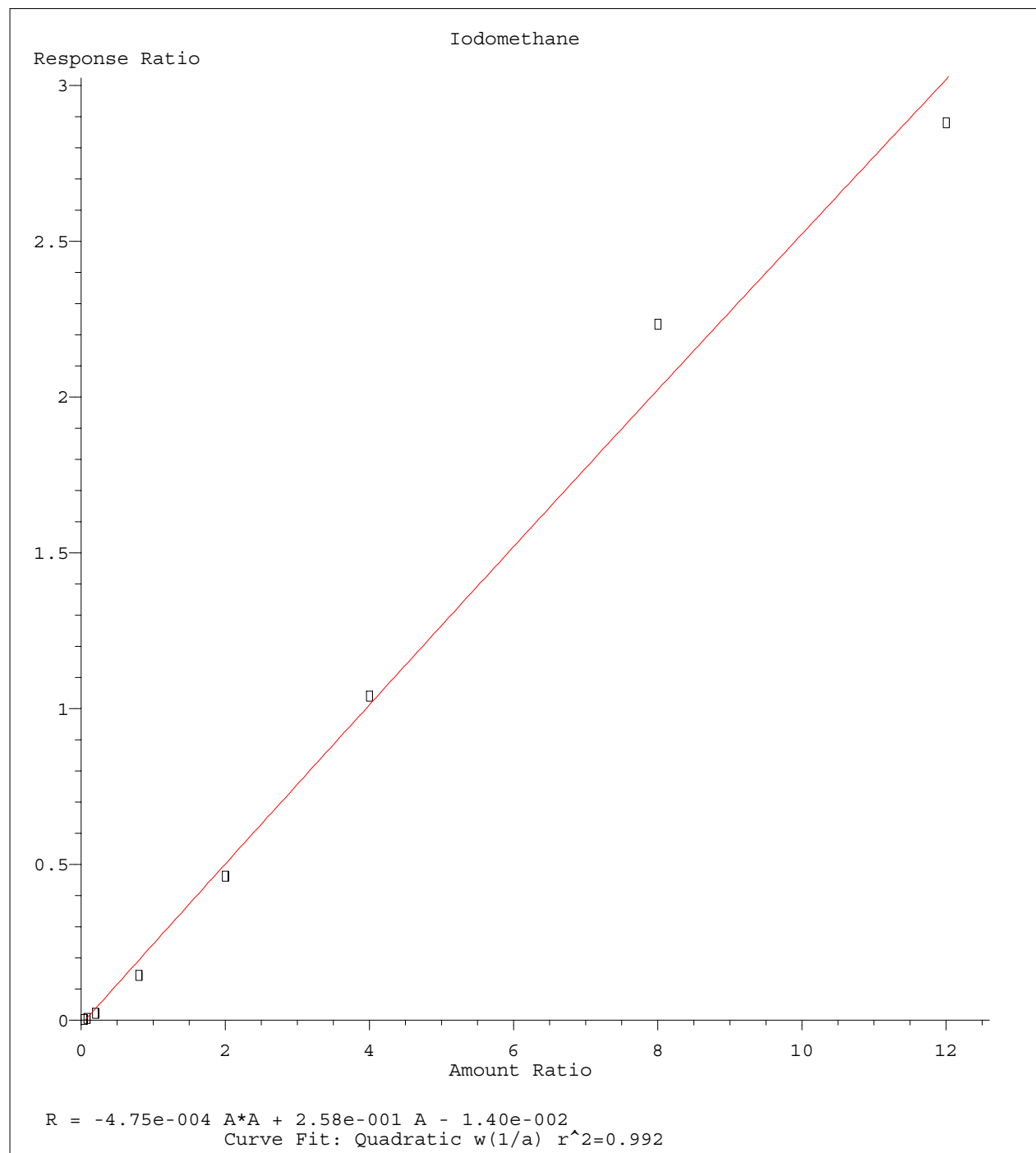
(#) = qualifier out of range (m) = manual integration
 8M418143.D 8260WT.M Mon Mar 06 12:10:58 2017

Page 2

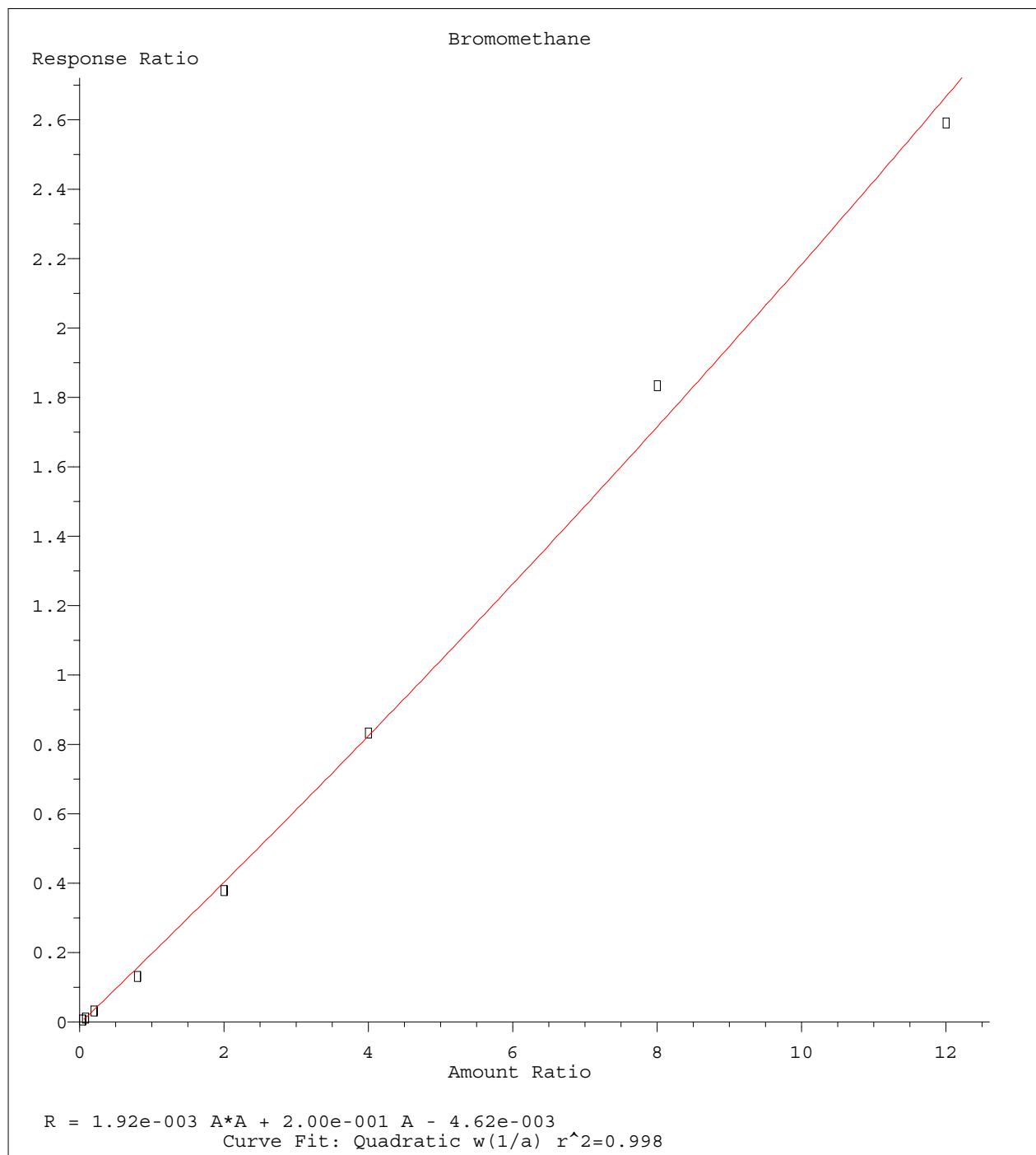
Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418143.D Vial: 12
Acq On : 3 Mar 2017 14:14 Operator: TMB
Sample : WG604846-11 300ug/L STD 8260 Inst : HPMS8
Misc : 1,1 STD80732 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration

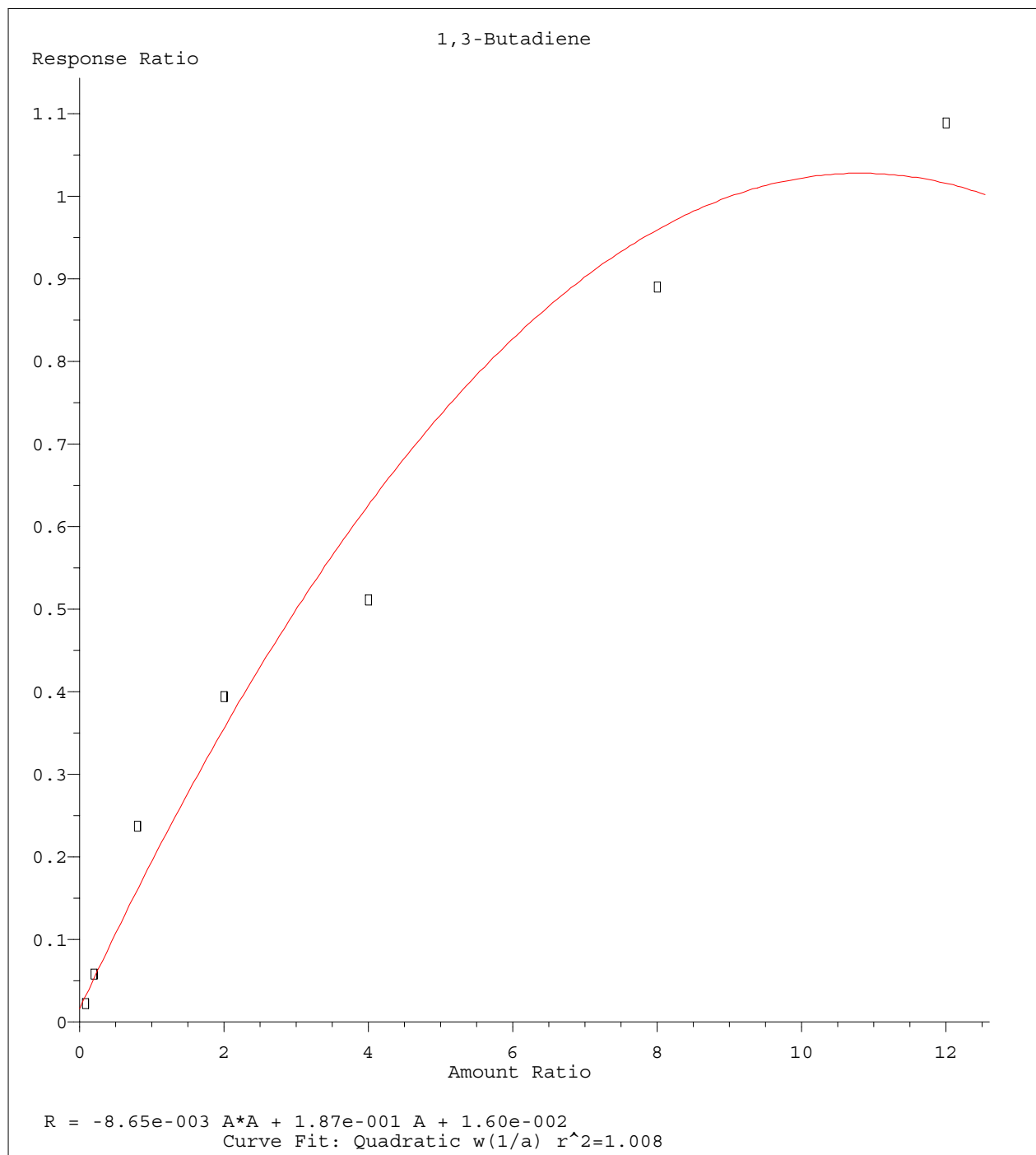




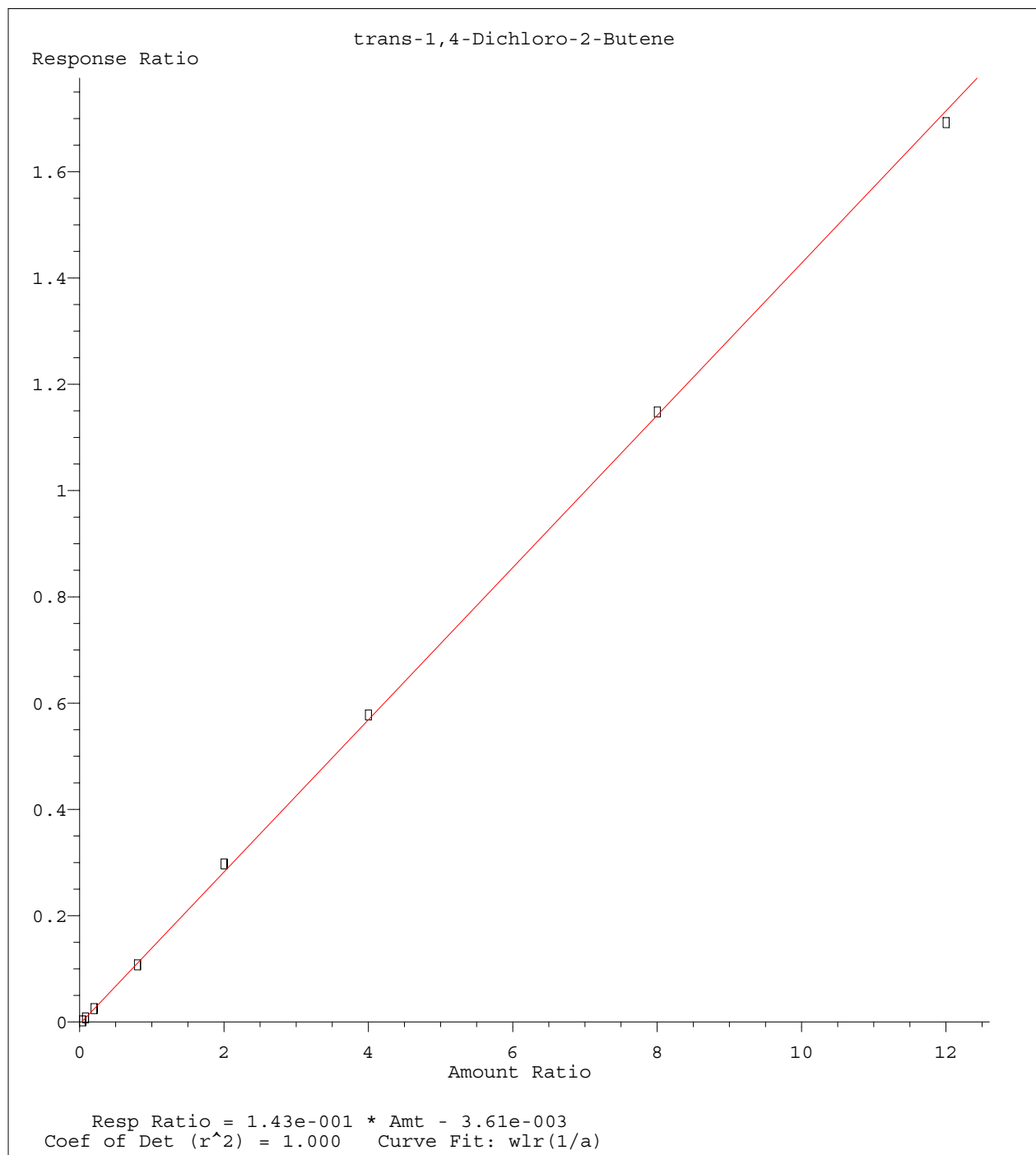
Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



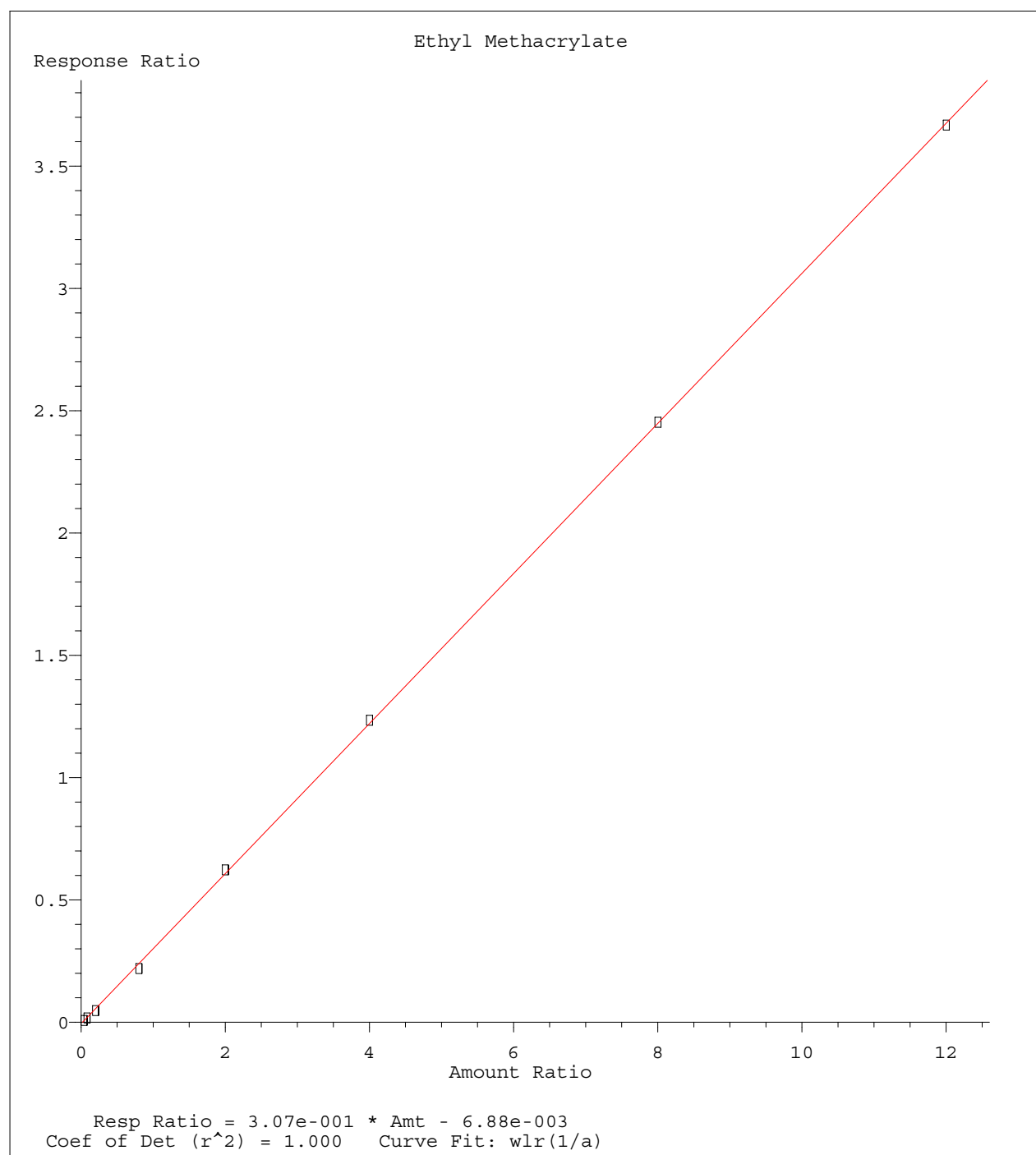
Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



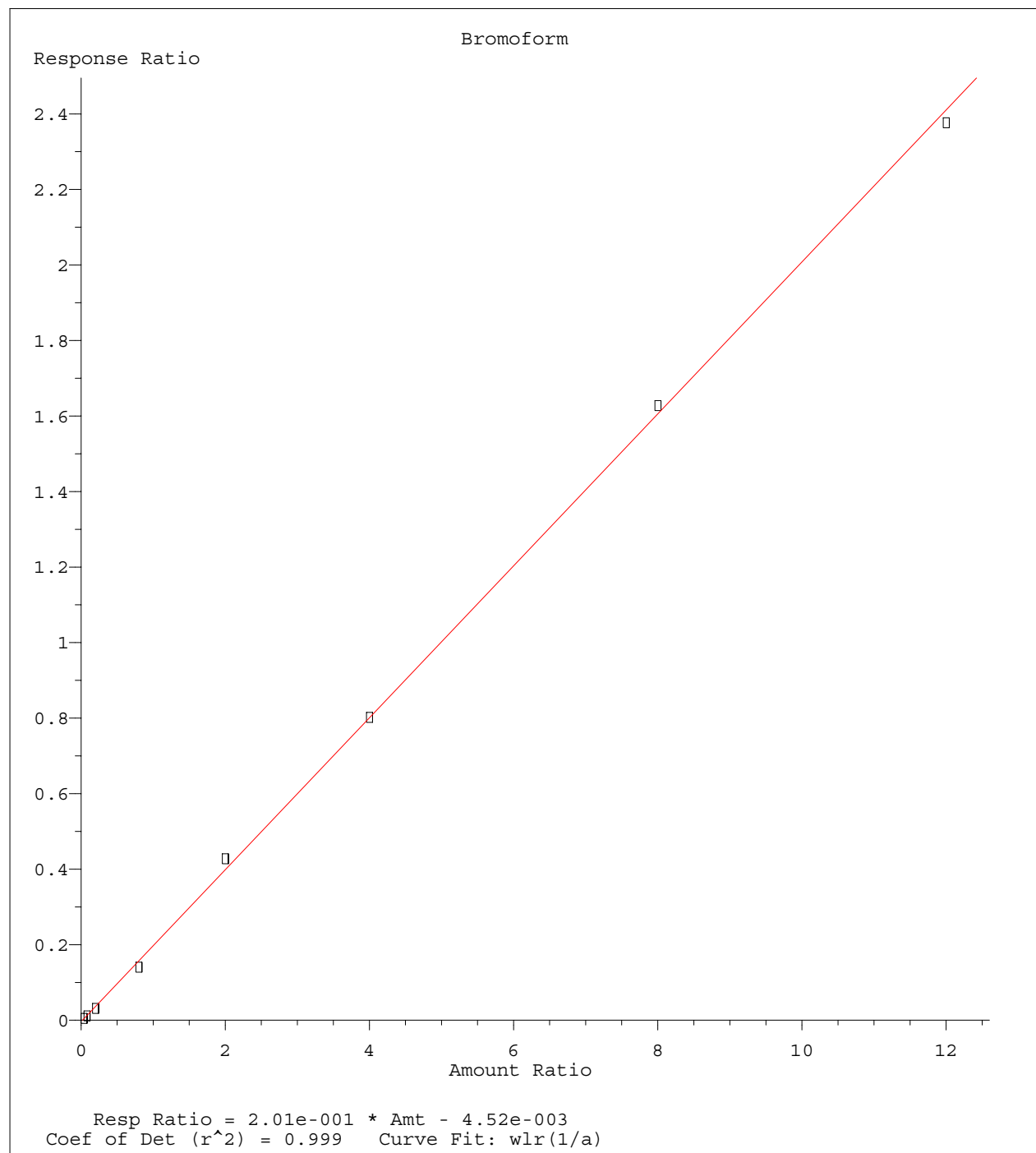
Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



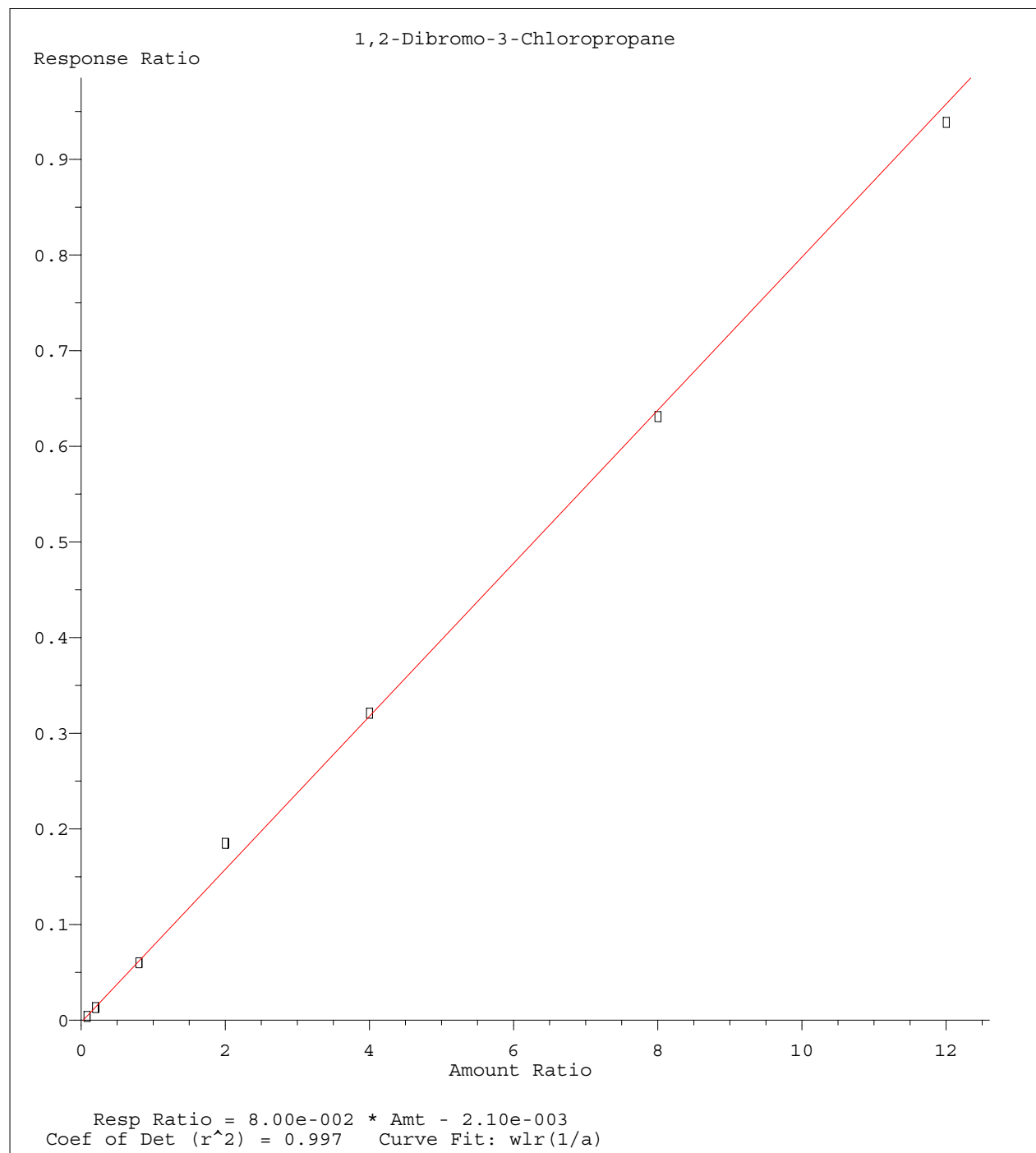
Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017



Method Name: K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M
Calibration Table Last Updated: Mon Mar 06 12:13:51 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418148.D Vial: 17
 Acq On : 3 Mar 2017 17:04 Operator: TMB
 Sample : WG604846-12 50ug/L ALT SRC STD Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 06 12:11:16 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	709380	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	551317	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	301496	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.90	111	166773	22.8909	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	91.56%	
43) 1,2-Dichloroethane-d4	10.55	65	149993	23.4901	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	93.96%	
58) Toluene-d8	12.93	98	612051	23.6055	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	94.44%	
80) p-Bromofluorobenzene	16.35	95	250817	24.0355	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	96.16%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.34	85	566176	59.6170	ug/L	100
3) Chloromethane	3.82	50	674101	50.1368	ug/L	100
4) Vinyl Chloride	4.05	62	516980	44.0786	ug/L	100
5) 1,3-Butadiene	4.09	54	213622	41.2350	ug/L	98
6) Bromomethane	4.96	94	272023	47.7283	ug/L	99
7) Chloroethane	5.13	64	279081	55.7219	ug/L	98
8) Trichlorofluoromethane	5.61	101	622607	51.3467	ug/L	99
9) Diethyl ether	6.14	59	467712	99.2830	ug/L	100
10) Isoprene	6.18	67	564451	52.0092	ug/L	98
11) Acrolein	6.38	56	70199	110.7281	ug/L	96
12) 1,1,2-Trichloro-1,2,2-Trif	6.39	101	381344	53.9725	ug/L	97
13) Acetone	6.48	43	42860	47.5990	ug/L	99
14) 1,1-Dichloroethene	6.71	61	527984	48.7636	ug/L	96
15) Tert-Butyl Alcohol	6.82	59	57253	197.3352	ug/L	98
16) Dimethyl Sulfide	6.97	62	379050	47.1737	ug/L	95
17) Iodomethane	7.23	142	284783	40.2981	ug/L	97
18) Methyl acetate	7.24	43	123272	45.6210	ug/L	96
19) Methylene Chloride	7.50	84	364556	48.5519	ug/L	94
20) Carbon Disulfide	7.54	76	854677	37.0025	ug/L	100
21) Acrylonitrile	7.67	53	67465	50.7366	ug/L	100
22) Methyl Tert Butyl Ether	7.70	73	669260	47.9886	ug/L	100
23) trans-1,2-Dichloroethene	7.94	61	517465	49.5660	ug/L	96
24) n-Hexane	8.01	57	451202	45.0847	ug/L	97
25) Diisopropyl ether	8.35	45	2194342	103.0865	ug/L	98
26) Vinyl Acetate	8.53	43	466165	58.3307	ug/L	98
27) 1,1-Dichloroethane	8.56	63	653135	49.5352	ug/L	99
28) Ethyl-Tert-Butyl ether	8.93	59	1937269	98.9141	ug/L	100
29) 2-Butanone	9.12	43	67717	45.4442	ug/L	96
30) Propionitrile	9.22	54	51632	108.6563	ug/L	99
31) 2,2-Dichloropropane	9.34	77	574368	51.3947	ug/L	100
32) cis-1,2-Dichloroethene	9.41	96	411690	50.5058	ug/L	92
33) Chloroform	9.61	83	660153	47.7249	ug/L	99
34) 1-Bromopropane	9.75	122	102559	64.7893	ug/L	100
35) Bromochloromethane	9.84	130	228379	51.4500	ug/L	96
36) Tetrahydrofuran	9.87	42	99955	105.7025	ug/L	99
38) 1,1,1-Trichloroethane	10.14	97	598802	51.1279	ug/L	100
39) Cyclohexane	10.17	56	605115	48.7759	ug/L	100
40) 1,1-Dichloropropene	10.34	75	493232	49.4600	ug/L	97
41) Tert-Amyl-Methyl ether	10.44	73	1691332	104.1035	ug/L	99
42) Carbon Tetrachloride	10.49	117	543811	50.5273	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418148.D 8260WT.M Mon Mar 06 12:11:18 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418148.D Vial: 17
 Acq On : 3 Mar 2017 17:04 Operator: TMB
 Sample : WG604846-12 50ug/L ALT SRC STD Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 06 12:11:16 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

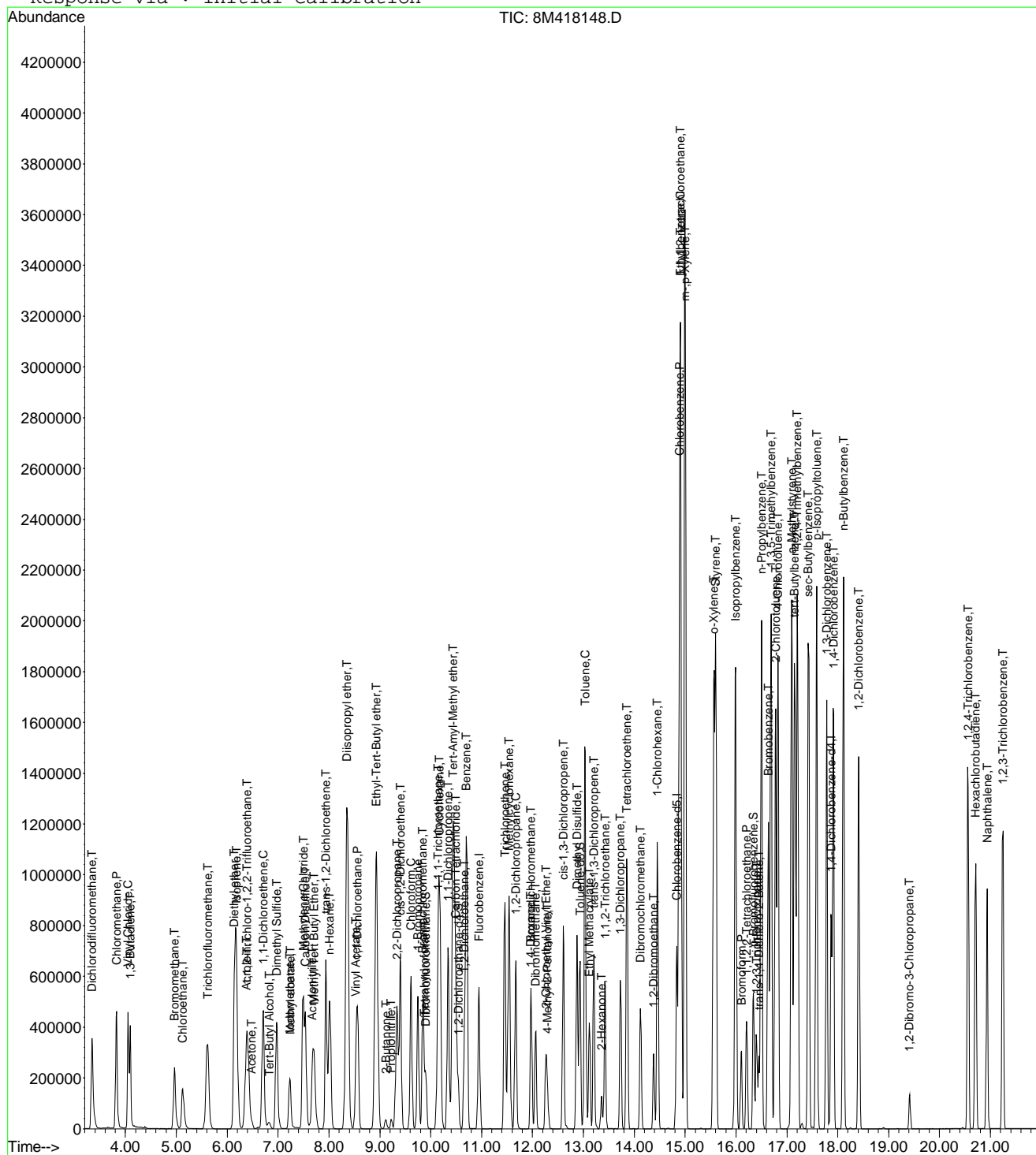
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	409356	49.1380	ug/L	98
46) Benzene	10.70	78	1416539	49.2527	ug/L	99
47) Trichloroethene	11.46	130	392942	47.1190	ug/L	99
48) Methylcyclohexane	11.54	83	620632	49.8390	ug/L	98
49) 1,2-Dichloropropane	11.67	63	349122	48.4647	ug/L	96
50) Bromodichloromethane	11.97	83	465622	48.9862	ug/L	100
51) 1,4-Dioxane	11.96	88	6672	191.4755	ug/L	91
52) Dibromomethane	12.05	93	185394	51.3187	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	150940	46.9670	ug/L	99
54) 4-Methyl-2-Pentanone	12.29	58	66398	46.4971	ug/L	96
55) cis-1,3-Dichloropropene	12.60	75	580877	53.1709	ug/L	100
56) Dimethyl Disulfide	12.87	79	301907	50.6548	ug/L	99
59) Toluene	13.04	91	1550285	49.9450	ug/L	100
60) Ethyl Methacrylate	13.12	69	323527	48.3544	ug/L	92
62) trans-1,3-Dichloropropene	13.20	75	463749	49.9834	ug/L	100
63) 1,1,2-Trichloroethane	13.43	97	248585	48.9357	ug/L	100
64) 2-Hexanone	13.36	58	63762	48.7748	ug/L	93
65) 1,3-Dichloropropane	13.73	76	441883	51.3080	ug/L	93
66) Tetrachloroethene	13.85	164	322694	48.2448	ug/L	96
67) Dibromochloromethane	14.12	129	333307	50.2719	ug/L	100
68) 1,2-Dibromoethane	14.38	107	252991	50.8213	ug/L	100
69) 1-Chlorohexane	14.45	91	548321	50.8596	ug/L	98
70) Chlorobenzene	14.89	112	1083145	48.0929	ug/L	96
71) 1,1,1,2-Tetrachloroethane	14.91	131	391601	48.4592	ug/L	99
72) Ethylbenzene	14.91	106	610582	48.0271	ug/L	97
73) m-,p-Xylene	15.00	106	1475288	101.2875	ug/L	98
74) o-Xylene	15.56	106	709905	48.6784	ug/L	100
75) Styrene	15.60	104	1216894	53.0451	ug/L	96
76) Bromoform	16.11	173	202057	46.1002	ug/L	99
77) Isopropylbenzene	15.99	105	1797521	50.3229	ug/L	100
79) 1,1,2,2-Tetrachloroethane	16.21	83	294065	52.6015	ug/L	100
81) 1,2,3-Trichloropropane	16.41	110	82880	51.0556	ug/L #	41
82) trans-1,4-Dichloro-2-Butene	16.45	53	81365	47.7127	ug/L #	37
83) n-Propylbenzene	16.50	91	2175054	50.4087	ug/L	99
84) Bromobenzene	16.64	156	459740	49.0391	ug/L	95
85) 1,3,5-Trimethylbenzene	16.69	105	1578672	51.1145	ug/L	100
86) 2-Chlorotoluene	16.78	91	1418017	48.7163	ug/L	99
87) 4-Chlorotoluene	16.82	91	1298841	51.1456	ug/L	99
88) a-Methylstyrene	17.09	118	897075	49.9556	ug/L	99
89) tert-Butylbenzene	17.15	134	347386	48.7488	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	1648710	51.3009	ug/L	98
91) sec-Butylbenzene	17.42	105	2006917	50.3764	ug/L	100
92) p-Isopropyltoluene	17.59	119	1738063	51.9809	ug/L	100
93) 1,3-Dichlorobenzene	17.78	146	917247	48.4357	ug/L	98
94) 1,4-Dichlorobenzene	17.92	146	920570	48.9329	ug/L	97
95) n-Butylbenzene	18.11	91	1663158	51.6998	ug/L	100
96) 1,2-Dichlorobenzene	18.41	146	814429	48.5565	ug/L	96
97) 1,2-Dibromo-3-Chloropropane	19.41	75	45707	48.0184	ug/L	92
98) 1,2,4-Trichlorobenzene	20.56	180	605281	49.5066	ug/L	99
99) Hexachlorobutadiene	20.71	225	282621	49.2091	ug/L	98
100) Naphthalene	20.94	128	975348	50.8577	ug/L	99
101) 1,2,3-Trichlorobenzene	21.25	180	504147	49.8391	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418148.D 8260WT.M Mon Mar 06 12:11:19 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418148.D Vial: 17
Acq On : 3 Mar 2017 17:04 Operator: TMB
Sample : WG604846-12 50ug/L ALT SRC STD Inst : HPMS8
Misc : 1,1 STD80765 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 6 12:11 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Fri Mar 03 15:26:23 2017
Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418148.D Vial: 17
 Acq On : 3 Mar 2017 17:04 Operator: TMB
 Sample : WG604846-12 50ug/L ALT SRC STD Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	108	0.00
2 T	Dichlorodifluoromethane	50.0000	59.6170	-19.2	118	0.00
3 P	Chloromethane	50.0000	50.1368	-0.3	108	0.01
4 C	Vinyl Chloride	50.0000	44.0786	11.8	94	0.00
5 T	1,3-Butadiene	50.0000	41.2349	17.5	83	0.00
6 T	Bromomethane	50.0000	47.7283	4.5	110	0.00
7 T	Chloroethane	50.0000	55.7219	-11.4	114	0.00
8 T	Trichlorofluoromethane	50.0000	51.3466	-2.7	108	0.00
9 T	Diethyl ether	100.0000	99.2830	0.7	103	0.00
10 T	Isoprene	50.0000	52.0092	-4.0	113	0.00
11 T	Acrolein	50.0000	110.7281	-121.5#	230	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	50.0000	53.9725	-7.9	112	0.00
13 T	Acetone	50.0000	47.5990	4.8	91	0.00
14 C	1,1-Dichloroethene	50.0000	48.7636	2.5	102	0.00
15 T	Tert-Butyl Alcohol	200.0000	197.3352	1.3	97	0.00
16 T	Dimethyl Sulfide	50.0000	47.1737	5.7	101	0.00
17 T	Iodomethane	50.0000	40.2981	19.4	94	0.00
18 T	Methyl acetate	50.0000	45.6210	8.8	96	0.00
19 T	Methylene Chloride	50.0000	48.5519	2.9	104	0.00
20 T	Carbon Disulfide	50.0000	37.0025	26.0#	78	0.00
21 T	Acrylonitrile	50.0000	50.7366	-1.5	95	0.00
22 T	Methyl Tert Butyl Ether	50.0000	47.9886	4.0	94	0.00
23 T	trans-1,2-Dichloroethene	50.0000	49.5660	0.9	104	0.00
24 T	n-Hexane	50.0000	45.0847	9.8	98	0.00
25 T	Diisopropyl ether	100.0000	103.0865	-3.1	107	0.00
26 T	Vinyl Acetate	50.0000	58.3307	-16.7	121	0.00
27 P	1,1-Dichloroethane	50.0000	49.5352	0.9	102	0.00
28 T	Ethyl-Tert-Butyl ether	100.0000	98.9141	1.1	102	0.00
29 T	2-Butanone	50.0000	45.4442	9.1	92	0.00
30 T	Propionitrile	100.0000	108.6563	-8.7	108	0.00
31 T	2,2-Dichloropropane	50.0000	51.3947	-2.8	109	0.00
32 T	cis-1,2-Dichloroethene	50.0000	50.5057	-1.0	103	0.00
33 C	Chloroform	50.0000	47.7249	4.6	104	0.00
34	1-Bromopropane	50.0000	64.7893	-29.6#	131	0.00
35 T	Bromochloromethane	50.0000	51.4500	-2.9	102	0.00
36 T	Tetrahydrofuran	100.0000	105.7025	-5.7	106	0.00
37 S	Dibromofluoromethane	25.0000	22.8909	8.4	96	0.00
38 T	1,1,1-Trichloroethane	50.0000	51.1279	-2.3	105	0.00
39 T	Cyclohexane	50.0000	48.7759	2.4	104	0.00
40 T	1,1-Dichloropropene	50.0000	49.4600	1.1	103	0.00
41 T	Tert-Amyl-Methyl ether	100.0000	104.1035	-4.1	106	0.00
42 T	Carbon Tetrachloride	50.0000	50.5273	-1.1	102	0.00
43 S	1,2-Dichloroethane-d4	25.0000	23.4901	6.0	95	0.00
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	50.0000	49.1380	1.7	98	0.00
46 T	Benzene	50.0000	49.2527	1.5	101	0.00
47 T	Trichloroethene	50.0000	47.1190	5.8	98	0.00
48 T	Methylcyclohexane	50.0000	49.8390	0.3	107	0.00
49 C	1,2-Dichloropropane	50.0000	48.4647	3.1	98	0.00
50 T	Bromodichloromethane	50.0000	48.9862	2.0	97	0.00
51 T	1,4-Dioxane	200.0000	191.4755	4.3	99	0.00
52 T	Dibromomethane	50.0000	51.3187	-2.6	100	0.00
53 T	2-Chloroethyl Vinyl Ether	50.0000	46.9670	6.1	92	0.00
54 T	4-Methyl-2-Pentanone	50.0000	46.4971	7.0	91	0.00

(#) = Out of Range

8M418148.D 8260WT.M

Mon Mar 06 12:14:20 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418148.D Vial: 17
 Acq On : 3 Mar 2017 17:04 Operator: TMB
 Sample : WG604846-12 50ug/L ALT SRC STD Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Fri Mar 03 15:26:23 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	50.0000	53.1709	-6.3	105	0.00
56 T	Dimethyl Disulfide	50.0000	50.6548	-1.3	107	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	108	0.00
58 S	Toluene-d8	25.0000	23.6055	5.6	98	0.00
59 C	Toluene	50.0000	49.9450	0.1	100	0.00
60 T	Ethyl Methacrylate	50.0000	48.3544	3.3	102	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	50.0000	49.9834	0.0	98	0.00
63 T	1,1,2-Trichloroethane	50.0000	48.9357	2.1	95	0.00
64 T	2-Hexanone	50.0000	48.7748	2.5	92	0.00
65 T	1,3-Dichloropropane	50.0000	51.3080	-2.6	99	0.00
66 T	Tetrachloroethene	50.0000	48.2448	3.5	102	0.00
67 T	Dibromochloromethane	50.0000	50.2719	-0.5	94	0.00
68 T	1,2-Dibromoethane	50.0000	50.8213	-1.6	97	0.00
69 T	1-Chlorohexane	50.0000	50.8597	-1.7	105	0.00
70 P	Chlorobenzene	50.0000	48.0929	3.8	98	0.00
71 T	1,1,1,2-Tetrachloroethane	50.0000	48.4592	3.1	95	0.00
72 C	Ethylbenzene	50.0000	48.0271	3.9	99	0.00
73 T	m-,p-Xylene	100.0000	101.2875	-1.3	100	0.00
74 T	o-Xylene	50.0000	48.6784	2.6	99	0.00
75 T	Styrene	50.0000	53.0451	-6.1	99	0.00
76 P	Bromoform	50.0000	46.1002	7.8	93	0.00
77 T	Isopropylbenzene	50.0000	50.3229	-0.6	97	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	108	0.00
79 P	1,1,2,2-Tetrachloroethane	50.0000	52.6016	-5.2	96	0.00
80 S	p-Bromofluorobenzene	25.0000	24.0355	3.9	100	0.00
81 T	1,2,3-Trichloropropane	50.0000	51.0556	-2.1	96	0.00
82 T	trans-1,4-Dichloro-2-Butene	50.0000	47.7127	4.6	98	0.00
83 T	n-Propylbenzene	50.0000	50.4087	-0.8	98	0.00
84 T	Bromobenzene	50.0000	49.0391	1.9	96	0.00
85 T	1,3,5-Trimethylbenzene	50.0000	51.1145	-2.2	99	0.00
86 T	2-Chlorotoluene	50.0000	48.7163	2.6	97	0.00
87 T	4-Chlorotoluene	50.0000	51.1456	-2.3	99	0.00
88 T	a-Methylstyrene	50.0000	49.9556	0.1	105	0.00
89 T	tert-Butylbenzene	50.0000	48.7488	2.5	100	0.00
90 T	1,2,4-Trimethylbenzene	50.0000	51.3009	-2.6	98	0.00
91 T	sec-Butylbenzene	50.0000	50.3764	-0.8	98	0.00
92 T	p-Isopropyltoluene	50.0000	51.9809	-4.0	100	0.00
93 T	1,3-Dichlorobenzene	50.0000	48.4357	3.1	96	0.00
94 T	1,4-Dichlorobenzene	50.0000	48.9329	2.1	97	0.00
95 T	n-Butylbenzene	50.0000	51.6998	-3.4	100	0.00
96 T	1,2-Dichlorobenzene	50.0000	48.5564	2.9	96	0.00
97 T	1,2-Dibromo-3-Chloropropane	50.0000	48.0184	4.0	89	0.00
98 T	1,2,4-Trichlorobenzene	50.0000	49.5065	1.0	96	0.00
99 T	Hexachlorobutadiene	50.0000	49.2091	1.6	98	0.00
100 T	Naphthalene	50.0000	50.8577	-1.7	92	0.00
101 T	1,2,3-Trichlorobenzene	50.0000	49.8391	0.3	95	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418148.D 8260WT.M Mon Mar 06 12:14:20 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 11:10:31 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	631844	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	496870	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	269544	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.91	111	147678	22.7574	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	91.04%	
43) 1,2-Dichloroethane-d4	10.55	65	124544	21.8981	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	87.60%	
58) Toluene-d8	12.94	98	548318	23.4648	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	93.84%	
80) p-Bromofluorobenzene	16.35	95	216902	23.2494	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	93.00%	

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
2) Dichlorodifluoromethane	3.34	85	463265	54.7668	ug/L	100
3) Chloromethane	3.83	50	631136	52.7016	ug/L	100
4) Vinyl Chloride	4.05	62	591841	56.6537	ug/L	100
5) 1,3-Butadiene	4.11	54	321374	76.6828	ug/L	99
6) Bromomethane	4.97	94	234937	46.3215	ug/L	100
7) Chloroethane	5.13	64	232663	52.1546	ug/L	99
8) Trichlorofluoromethane	5.61	101	549641	50.8916	ug/L	99
9) Diethyl ether	6.14	59	396019	94.3803	ug/L	99
10) Isoprene	6.18	67	478257	49.4748	ug/L	98
11) Acrolein	6.38	56	24641	43.6370	ug/L	100
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	326568	51.8917	ug/L	99
13) Acetone	6.48	43	36921	46.0350	ug/L	100
14) 1,1-Dichloroethene	6.71	61	482677	50.0496	ug/L	95
15) Tert-Butyl Alcohol	6.81	59	51997	201.2119	ug/L	98
16) Dimethyl Sulfide	6.97	62	342869	47.9072	ug/L	95
17) Iodomethane	7.23	142	274497	43.5079	ug/L	96
18) Methyl acetate	7.24	43	111504	46.3297	ug/L	96
19) Methylene Chloride	7.50	84	323815	48.4181	ug/L	96
20) Carbon Disulfide	7.54	76	1045424	50.8149	ug/L	99
21) Acrylonitrile	7.67	53	58958	49.7800	ug/L	96
22) Methyl Tert Butyl Ether	7.70	73	594235	47.8377	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	463657	49.8619	ug/L	94
24) n-Hexane	8.01	57	456530	51.2149	ug/L	98
25) Diisopropyl ether	8.35	45	1892214	99.8015	ug/L	98
26) Vinyl Acetate	8.53	43	359889	50.5586	ug/L	99
27) 1,1-Dichloroethane	8.56	63	597628	50.8875	ug/L	100
28) Ethyl-Tert-Butyl ether	8.93	59	1687453	96.7318	ug/L	100
29) 2-Butanone	9.12	43	59940	45.1613	ug/L	97
30) Propionitrile	9.22	54	42108	99.4878	ug/L	97
31) 2,2-Dichloropropane	9.34	77	519954	52.2351	ug/L	100
32) cis-1,2-Dichloroethene	9.41	96	374986	51.6481	ug/L	92
33) Chloroform	9.62	83	593088	48.1380	ug/L	99
34) 1-Bromopropane	9.75	122	73787	52.3333	ug/L	99
35) Bromochloromethane	9.85	130	195940	49.5589	ug/L	98
36) Tetrahydrofuran	9.87	42	84794	100.6734	ug/L	98
38) 1,1,1-Trichloroethane	10.15	97	533623	51.1538	ug/L	99
39) Cyclohexane	10.18	56	552679	50.0160	ug/L	99
40) 1,1-Dichloropropene	10.35	75	451278	50.8062	ug/L	97
41) Tert-Amyl-Methyl ether	10.44	73	1395821	96.4573	ug/L	99
42) Carbon Tetrachloride	10.49	117	497578	51.9049	ug/L	100

(#) = qualifier out of range (m) = manual integration
 8M418190.D 8260WT.M Tue Mar 07 11:10:34 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 11:10:31 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

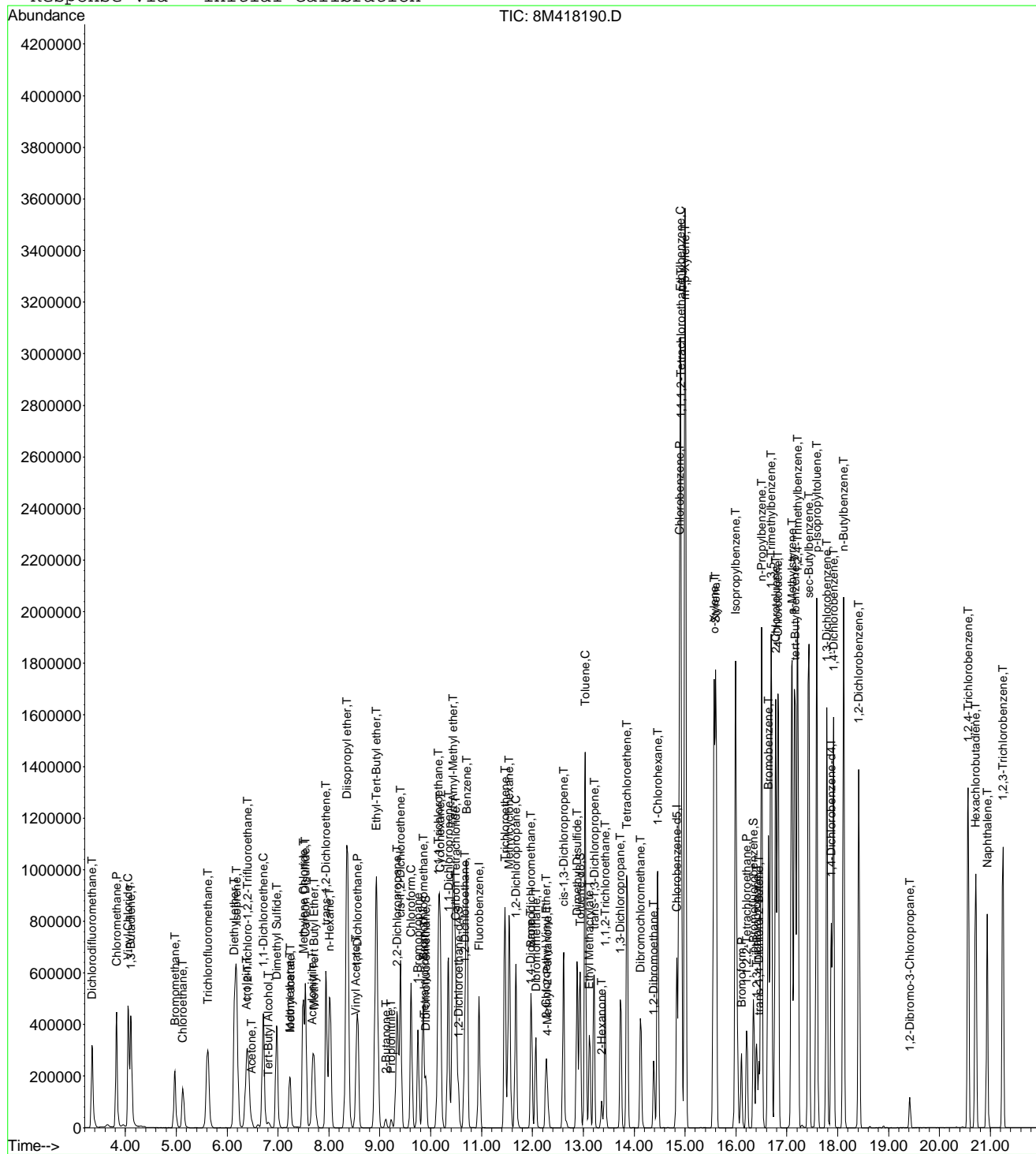
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.67	62	361901	48.7725	ug/L	99
46) Benzene	10.71	78	1317675	51.4374	ug/L	98
47) Trichloroethene	11.46	130	373398	50.2699	ug/L	99
48) Methylcyclohexane	11.54	83	551193	49.6945	ug/L	98
49) 1,2-Dichloropropane	11.67	63	327091	50.9784	ug/L	95
50) Bromodichloromethane	11.97	83	431867	51.0105	ug/L	100
51) 1,4-Dioxane	11.96	88	7061	227.5058	ug/L	95
52) Dibromomethane	12.07	93	160296	49.8163	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	133978	46.8048	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	58690	46.1428	ug/L	96
55) cis-1,3-Dichloropropene	12.61	75	494735	50.8431	ug/L	100
56) Dimethyl Disulfide	12.87	79	255583	48.1447	ug/L	99
59) Toluene	13.04	91	1447253	51.7348	ug/L	99
60) Ethyl Methacrylate	13.12	69	266424	44.2316	ug/L	95
62) trans-1,3-Dichloropropene	13.21	75	412717	49.3576	ug/L	99
63) 1,1,2-Trichloroethane	13.43	97	219124	47.8630	ug/L	100
64) 2-Hexanone	13.36	58	53044	45.0223	ug/L	96
65) 1,3-Dichloropropane	13.73	76	376786	48.5435	ug/L	92
66) Tetrachloroethene	13.86	164	298713	49.5533	ug/L	95
67) Dibromochloromethane	14.12	129	301266	50.4184	ug/L	99
68) 1,2-Dibromoethane	14.38	107	221054	49.2717	ug/L	99
69) 1-Chlorohexane	14.47	91	496205	51.0691	ug/L	97
70) Chlorobenzene	14.89	112	1012626	49.8887	ug/L	95
71) 1,1,1,2-Tetrachloroethane	14.92	131	367012	50.3931	ug/L	98
72) Ethylbenzene	14.91	106	570104	49.7571	ug/L	96
73) m-,p-Xylene	15.00	106	1386902	105.6534	ug/L	98
74) o-Xylene	15.57	106	661367	50.3197	ug/L	99
75) Styrene	15.60	104	1115796	53.9679	ug/L	95
76) Bromoform	16.11	173	179398	45.4239	ug/L	99
77) Isopropylbenzene	16.00	105	1713943	53.2411	ug/L	99
79) 1,1,2,2-Tetrachloroethane	16.21	83	248680	49.7563	ug/L	99
81) 1,2,3-Trichloropropane	16.41	110	71390	49.1906	ug/L	97
82) trans-1,4-Dichloro-2-Butene	16.45	53	66552	43.7062	ug/L	96
83) n-Propylbenzene	16.50	91	2090859	54.2016	ug/L	99
84) Bromobenzene	16.64	156	423409	50.5175	ug/L	93
85) 1,3,5-Trimethylbenzene	16.69	105	1485071	53.7838	ug/L	100
86) 2-Chlorotoluene	16.78	91	1298161	49.8854	ug/L	99
87) 4-Chlorotoluene	16.82	91	1254459	55.2536	ug/L	99
88) a-Methylstyrene	17.10	118	810721	50.4985	ug/L	98
89) tert-Butylbenzene	17.16	134	320686	50.3366	ug/L	97
90) 1,2,4-Trimethylbenzene	17.22	105	1541990	53.6678	ug/L	98
91) sec-Butylbenzene	17.43	105	1935523	54.3436	ug/L	99
92) p-Isopropyltoluene	17.59	119	1617312	54.1033	ug/L	100
93) 1,3-Dichlorobenzene	17.78	146	870153	51.3957	ug/L	97
94) 1,4-Dichlorobenzene	17.92	146	849026	50.4797	ug/L	96
95) n-Butylbenzene	18.12	91	1558656	54.1948	ug/L	99
96) 1,2-Dichlorobenzene	18.41	146	746328	49.7709	ug/L	96
97) 1,2-Dibromo-3-Chloropropane	19.42	75	39200	46.0909	ug/L	91
98) 1,2,4-Trichlorobenzene	20.57	180	542395	49.6219	ug/L	99
99) Hexachlorobutadiene	20.71	225	258173	50.2810	ug/L	99
100) Naphthalene	20.94	128	839084	48.9390	ug/L	100
101) 1,2,3-Trichlorobenzene	21.25	180	440407	48.6989	ug/L	98

(#) = qualifier out of range (m) = manual integration
 8M418190.D 8260WT.M Tue Mar 07 11:10:34 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
Acq On : 7 Mar 2017 10:37 Operator: TMB
Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
Misc : 1,1 STD80765 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 7 11:10 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Mon Mar 06 12:17:52 2017
Response via : Initial Calibration



Continuing Calibration Area and RT check

Instrument: HPMS8
Initial cal date: 3 Mar 2017 12:46
CCV date: 7 Mar 2017 10:37
CCV Filename: 8M418190.D

	Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
	Amount	RT	Amount	RT	Amount	RT
InitCal	654600	10.95	509436	14.84	278577	17.88
CCV	631844	10.95	496870	14.84	269544	17.88

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	1.0000	1.0000	0.0	97	0.00
2 T	Dichlorodifluoromethane	0.3347	0.3666	-9.5	96	0.00
3 P	Chloromethane	0.4738	0.4994	-5.4	101	0.01
4 C	Vinyl Chloride	0.4133	0.4683	-13.3	108	0.00
5 T	1,3-Butadiene	0.1987	0.2543	-28.0#	125	0.01
6 T	Bromomethane	0.1803	0.1859	-3.1	95	0.01
7 T	Chloroethane	0.1765	0.1841	-4.3	95	0.00
8 T	Trichlorofluoromethane	0.4273	0.4350	-1.8	95	0.00
9 T	Diethyl ether	0.1660	0.1567	5.6	87	0.00
10 T	Isoprene	0.3825	0.3785	1.1	95	0.00
11 T	Acrolein	0.0223	0.0195	12.7	81	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	0.2490	0.2584	-3.8	96	0.01
13 T	Acetone	0.0317	0.0292	7.9	78	0.00
14 C	1,1-Dichloroethene	0.3816	0.3820	-0.1	93	0.00
15 T	Tert-Butyl Alcohol	0.0102	0.0103	-0.7	88	0.00
16 T	Dimethyl Sulfide	0.2832	0.2713	4.2	91	0.00
17 T	Iodomethane	0.1787	0.2172	-21.6	91	0.00
18 T	Methyl acetate	0.0952	0.0882	7.3	86	0.00
19 T	Methylene Chloride	0.2646	0.2562	3.2	93	0.00
20 T	Carbon Disulfide	0.8140	0.8273	-1.6	95	0.00
21 T	Acrylonitrile	0.0469	0.0467	0.4	83	0.00
22 T	Methyl Tert Butyl Ether	0.4915	0.4702	4.3	84	0.00
23 T	trans-1,2-Dichloroethene	0.3679	0.3669	0.3	93	0.00
24 T	n-Hexane	0.3527	0.3613	-2.4	99	0.00
25 T	Diisopropyl ether	0.7502	0.7487	0.2	92	0.00
26 T	Vinyl Acetate	0.2817	0.2848	-1.1	93	0.00
27 P	1,1-Dichloroethane	0.4647	0.4729	-1.8	93	0.00
28 T	Ethyl-Tert-Butyl ether	0.6902	0.6677	3.3	88	0.00
29 T	2-Butanone	0.0525	0.0474	9.7	81	0.00
30 T	Propionitrile	0.0168	0.0167	0.5	88	0.00
31 T	2,2-Dichloropropane	0.3938	0.4115	-4.5	98	0.00
32 T	cis-1,2-Dichloroethene	0.2873	0.2967	-3.3	94	0.00
33 C	Chloroform	0.4875	0.4693	3.7	94	0.00
34	1-Bromopropane	0.0558	0.0584	-4.7	94	0.00
35 T	Bromochloromethane	0.1564	0.1550	0.9	88	0.00
36 T	Tetrahydrofuran	0.0333	0.0336	-0.7	90	0.00
37 S	Dibromofluoromethane	0.2568	0.2337	9.0	85	0.00
38 T	1,1,1-Trichloroethane	0.4128	0.4223	-2.3	93	0.01
39 T	Cyclohexane	0.4372	0.4374	-0.0	95	0.01
40 T	1,1-Dichloropropene	0.3514	0.3571	-1.6	94	0.01
41 T	Tert-Amyl-Methyl ether	0.5726	0.5523	3.5	87	0.00
42 T	Carbon Tetrachloride	0.3793	0.3937	-3.8	94	0.00
43 S	1,2-Dichloroethane-d4	0.2250	0.1971	12.4	79	0.00
44	Heptane	0.0000	0.0000	0.0	0#	-2.61#
45 T	1,2-Dichloroethane	0.2936	0.2864	2.5	87	0.01
46 T	Benzene	1.0136	1.0427	-2.9	94	0.01
47 T	Trichloroethene	0.2939	0.2955	-0.5	93	0.00
48 T	Methylcyclohexane	0.4389	0.4362	0.6	95	0.00
49 C	1,2-Dichloropropane	0.2539	0.2588	-2.0	92	0.00
50 T	Bromodichloromethane	0.3350	0.3418	-2.0	90	0.00
51 T	1,4-Dioxane	0.0012	0.0014	-13.8	104	0.00
52 T	Dibromomethane	0.1273	0.1268	0.4	86	0.00
53 T	2-Chloroethyl Vinyl Ether	0.1133	0.1060	6.4	82	0.00
54 T	4-Methyl-2-Pentanone	0.0503	0.0464	7.7	80	0.00

(#) = Out of Range

8M418190.D 8260WT.M

Tue Mar 07 11:10:45 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	0.3850	0.3915	-1.7	90	0.00
56 T	Dimethyl Disulfide	0.2100	0.2023	3.7	91	0.00
57 I	Chlorobenzene-d5	1.0000	1.0000	0.0	98	0.00
58 S	Toluene-d8	1.1757	1.1035	6.1	88	0.00
59 C	Toluene	1.4075	1.4564	-3.5	94	0.00
60 T	Ethyl Methacrylate	0.2685	0.2681	0.2	84	0.00
61	Paraldehyde	0.0000	0.0000	0.0	0#	-13.40#
62 T	trans-1,3-Dichloropropene	0.4207	0.4153	1.3	87	0.01
63 T	1,1,2-Trichloroethane	0.2304	0.2205	4.3	84	0.00
64 T	2-Hexanone	0.0593	0.0534	10.0	77	0.00
65 T	1,3-Dichloropropane	0.3905	0.3792	2.9	84	0.00
66 T	Tetrachloroethene	0.3033	0.3006	0.9	94	0.00
67 T	Dibromochloromethane	0.3006	0.3032	-0.8	85	0.00
68 T	1,2-Dibromoethane	0.2257	0.2225	1.5	85	0.00
69 T	1-Chlorohexane	0.4889	0.4993	-2.1	95	0.00
70 P	Chlorobenzene	1.0213	1.0190	0.2	92	0.00
71 T	1,1,1,2-Tetrachloroethane	0.3664	0.3693	-0.8	89	0.00
72 C	Ethylbenzene	0.5765	0.5737	0.5	92	0.00
73 T	m-,p-Xylene	0.6605	0.6978	-5.7	94	0.00
74 T	o-Xylene	0.6613	0.6655	-0.6	92	0.00
75 T	Styrene	1.0403	1.1228	-7.9	90	0.00
76 P	Bromoform	0.1759	0.1805	-2.6	82	0.00
77 T	Isopropylbenzene	1.6198	1.7247	-6.5	92	0.00
78 I	1,4-Dichlorobenzene-d4	1.0000	1.0000	0.0	97	0.00
79 P	1,1,2,2-Tetrachloroethane	0.4636	0.4613	0.5	81	0.00
80 S	p-Bromofluorobenzene	0.8653	0.8047	7.0	87	0.00
81 T	1,2,3-Trichloropropane	0.1346	0.1324	1.6	83	0.00
82 T	trans-1,4-Dichloro-2-Butene	0.1231	0.1235	-0.3	80	0.00
83 T	n-Propylbenzene	3.5779	3.8785	-8.4	94	0.00
84 T	Bromobenzene	0.7774	0.7854	-1.0	89	0.00
85 T	1,3,5-Trimethylbenzene	2.5610	2.7548	-7.6	93	0.00
86 T	2-Chlorotoluene	2.4136	2.4081	0.2	88	0.00
87 T	4-Chlorotoluene	2.1058	2.3270	-10.5	96	0.00
88 T	a-Methylstyrene	1.4890	1.5039	-1.0	95	0.00
89 T	tert-Butylbenzene	0.5909	0.5949	-0.7	92	0.00
90 T	1,2,4-Trimethylbenzene	2.6649	2.8604	-7.3	92	0.00
91 T	sec-Butylbenzene	3.3034	3.5904	-8.7	94	0.00
92 T	p-Isopropyltoluene	2.7725	3.0001	-8.2	93	0.00
93 T	1,3-Dichlorobenzene	1.5703	1.6141	-2.8	91	0.00
94 T	1,4-Dichlorobenzene	1.5600	1.5749	-1.0	89	0.00
95 T	n-Butylbenzene	2.6675	2.8913	-8.4	94	0.00
96 T	1,2-Dichlorobenzene	1.3908	1.3844	0.5	88	0.00
97 T	1,2-Dibromo-3-Chloropropane	0.0741	0.0727	1.9	76	0.00
98 T	1,2,4-Trichlorobenzene	1.0138	1.0061	0.8	86	0.00
99 T	Hexachlorobutadiene	0.4762	0.4789	-0.6	90	0.00
100 T	Naphthalene	1.5902	1.5565	2.1	79	0.00
101 T	1,2,3-Trichlorobenzene	0.8388	0.8169	2.6	83	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418190.D 8260WT.M Tue Mar 07 11:10:45 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	Fluorobenzene	25.0000	25.0000	0.0	97	0.00
2 T	Dichlorodifluoromethane	50.0000	54.7668	-9.5	96	0.00
3 P	Chloromethane	50.0000	52.7016	-5.4	101	0.01
4 C	Vinyl Chloride	50.0000	56.6537	-13.3	108	0.00
5 T	1,3-Butadiene	50.0000	76.6828	-53.4#	125	0.01
6 T	Bromomethane	50.0000	46.3215	7.4	95	0.01
7 T	Chloroethane	50.0000	52.1546	-4.3	95	0.00
8 T	Trichlorofluoromethane	50.0000	50.8916	-1.8	95	0.00
9 T	Diethyl ether	100.0000	94.3803	5.6	87	0.00
10 T	Isoprene	50.0000	49.4748	1.1	95	0.00
11 T	Acrolein	50.0000	43.6370	12.7	81	0.00
12 T	1,1,2-Trichloro-1,2,2-Trifl	50.0000	51.8917	-3.8	96	0.01
13 T	Acetone	50.0000	46.0350	7.9	78	0.00
14 C	1,1-Dichloroethene	50.0000	50.0496	-0.1	93	0.00
15 T	Tert-Butyl Alcohol	200.0000	201.2119	-0.6	88	0.00
16 T	Dimethyl Sulfide	50.0000	47.9072	4.2	91	0.00
17 T	Iodomethane	50.0000	43.5079	13.0	91	0.00
18 T	Methyl acetate	50.0000	46.3297	7.3	86	0.00
19 T	Methylene Chloride	50.0000	48.4181	3.2	93	0.00
20 T	Carbon Disulfide	50.0000	50.8149	-1.6	95	0.00
21 T	Acrylonitrile	50.0000	49.7800	0.4	83	0.00
22 T	Methyl Tert Butyl Ether	50.0000	47.8377	4.3	84	0.00
23 T	trans-1,2-Dichloroethene	50.0000	49.8619	0.3	93	0.00
24 T	n-Hexane	50.0000	51.2149	-2.4	99	0.00
25 T	Diisopropyl ether	100.0000	99.8015	0.2	92	0.00
26 T	Vinyl Acetate	50.0000	50.5586	-1.1	93	0.00
27 P	1,1-Dichloroethane	50.0000	50.8875	-1.8	93	0.00
28 T	Ethyl-Tert-Butyl ether	100.0000	96.7318	3.3	88	0.00
29 T	2-Butanone	50.0000	45.1613	9.7	81	0.00
30 T	Propionitrile	100.0000	99.4878	0.5	88	0.00
31 T	2,2-Dichloropropane	50.0000	52.2351	-4.5	98	0.00
32 T	cis-1,2-Dichloroethene	50.0000	51.6481	-3.3	94	0.00
33 C	Chloroform	50.0000	48.1381	3.7	94	0.00
34	1-Bromopropane	50.0000	52.3333	-4.7	94	0.00
35 T	Bromochloromethane	50.0000	49.5589	0.9	88	0.00
36 T	Tetrahydrofuran	100.0000	100.6734	-0.7	90	0.00
37 S	Dibromofluoromethane	25.0000	22.7574	9.0	85	0.00
38 T	1,1,1-Trichloroethane	50.0000	51.1538	-2.3	93	0.01
39 T	Cyclohexane	50.0000	50.0160	-0.0	95	0.01
40 T	1,1-Dichloropropene	50.0000	50.8062	-1.6	94	0.01
41 T	Tert-Amyl-Methyl ether	100.0000	96.4573	3.5	87	0.00
42 T	Carbon Tetrachloride	50.0000	51.9049	-3.8	94	0.00
43 S	1,2-Dichloroethane-d4	25.0000	21.8981	12.4	79	0.00
44	Heptane	-1.0000	0.0000	0.0	0	-2.61#
45 T	1,2-Dichloroethane	50.0000	48.7725	2.5	87	0.01
46 T	Benzene	50.0000	51.4374	-2.9	94	0.01
47 T	Trichloroethene	50.0000	50.2700	-0.5	93	0.00
48 T	Methylcyclohexane	50.0000	49.6945	0.6	95	0.00
49 C	1,2-Dichloropropane	50.0000	50.9784	-2.0	92	0.00
50 T	Bromodichloromethane	50.0000	51.0105	-2.0	90	0.00
51 T	1,4-Dioxane	200.0000	227.5058	-13.8	104	0.00
52 T	Dibromomethane	50.0000	49.8163	0.4	86	0.00
53 T	2-Chloroethyl Vinyl Ether	50.0000	46.8048	6.4	82	0.00
54 T	4-Methyl-2-Pentanone	50.0000	46.1428	7.7	80	0.00

(#) = Out of Range

8M418190.D 8260WT.M

Tue Mar 07 11:10:47 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418190.D Vial: 2
 Acq On : 7 Mar 2017 10:37 Operator: TMB
 Sample : WG605280-02 50ug/L CCV STD 8260 Inst : HPMS8
 Misc : 1,1 STD80765 Multiplr: 1.00
 MS Integration Params: RTEINT.P

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

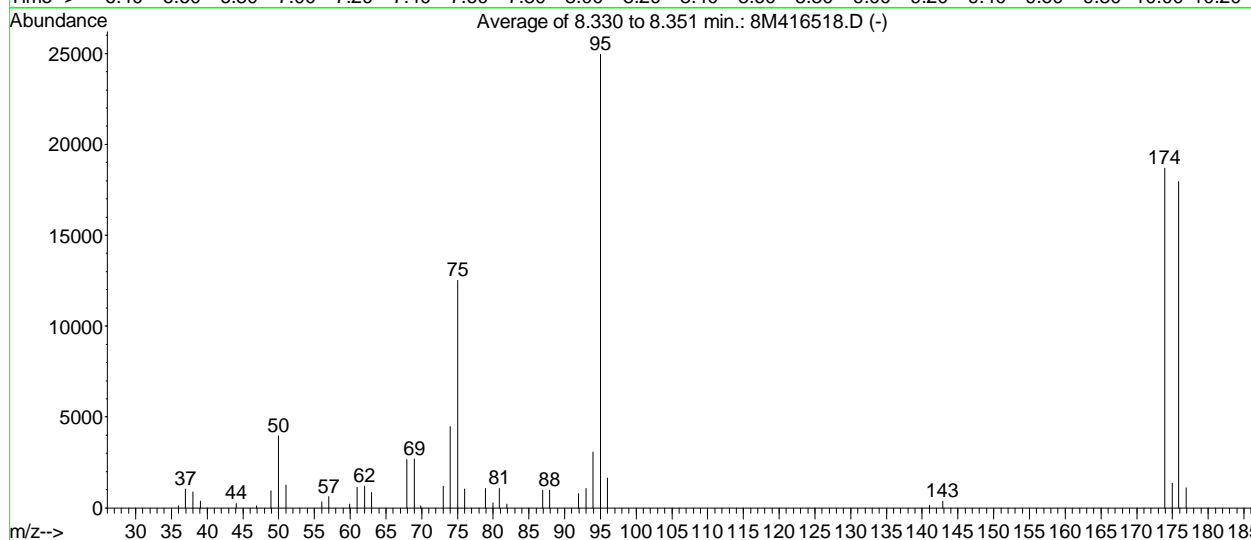
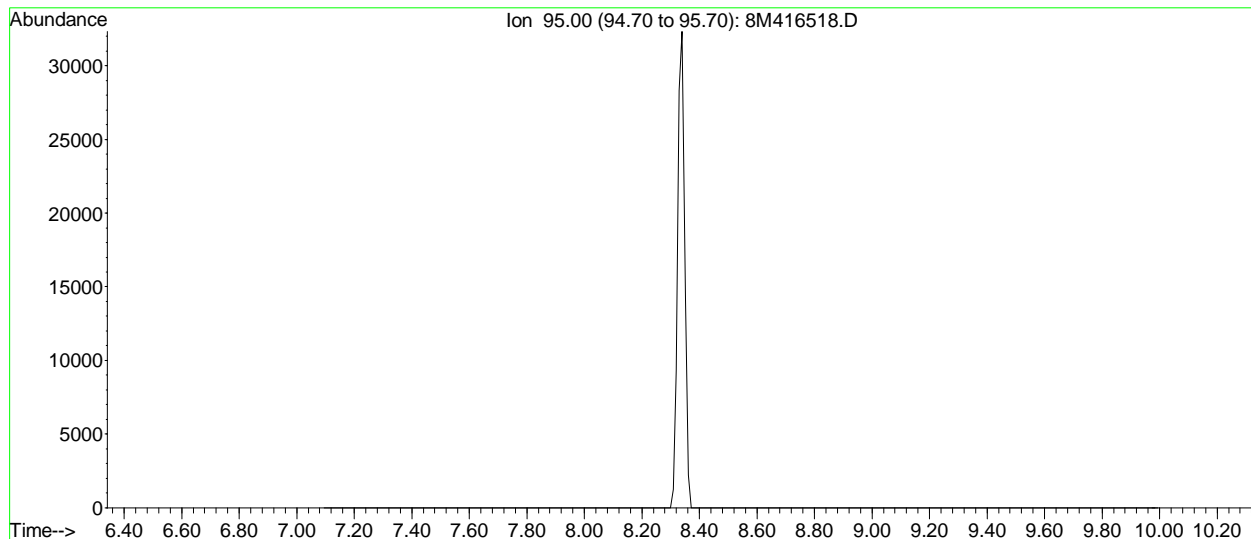
	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
55 T	cis-1,3-Dichloropropene	50.0000	50.8431	-1.7	90	0.00
56 T	Dimethyl Disulfide	50.0000	48.1447	3.7	91	0.00
57 I	Chlorobenzene-d5	25.0000	25.0000	0.0	98	0.00
58 S	Toluene-d8	25.0000	23.4648	6.1	88	0.00
59 C	Toluene	50.0000	51.7349	-3.5	94	0.00
60 T	Ethyl Methacrylate	50.0000	44.2316	11.5	84	0.00
61	Paraldehyde	-1.0000	0.0000	0.0	0	-13.40#
62 T	trans-1,3-Dichloropropene	50.0000	49.3576	1.3	87	0.01
63 T	1,1,2-Trichloroethane	50.0000	47.8630	4.3	84	0.00
64 T	2-Hexanone	50.0000	45.0223	10.0	77	0.00
65 T	1,3-Dichloropropane	50.0000	48.5435	2.9	84	0.00
66 T	Tetrachloroethene	50.0000	49.5533	0.9	94	0.00
67 T	Dibromochloromethane	50.0000	50.4184	-0.8	85	0.00
68 T	1,2-Dibromoethane	50.0000	49.2717	1.5	85	0.00
69 T	1-Chlorohexane	50.0000	51.0691	-2.1	95	0.00
70 P	Chlorobenzene	50.0000	49.8887	0.2	92	0.00
71 T	1,1,1,2-Tetrachloroethane	50.0000	50.3931	-0.8	89	0.00
72 C	Ethylbenzene	50.0000	49.7572	0.5	92	0.00
73 T	m-,p-Xylene	100.0000	105.6534	-5.7	94	0.00
74 T	o-Xylene	50.0000	50.3197	-0.6	92	0.00
75 T	Styrene	50.0000	53.9679	-7.9	90	0.00
76 P	Bromoform	50.0000	45.4239	9.2	82	0.00
77 T	Isopropylbenzene	50.0000	53.2411	-6.5	92	0.00
78 I	1,4-Dichlorobenzene-d4	25.0000	25.0000	0.0	97	0.00
79 P	1,1,2,2-Tetrachloroethane	50.0000	49.7563	0.5	81	0.00
80 S	p-Bromofluorobenzene	25.0000	23.2494	7.0	87	0.00
81 T	1,2,3-Trichloropropane	50.0000	49.1906	1.6	83	0.00
82 T	trans-1,4-Dichloro-2-Butene	50.0000	43.7062	12.6	80	0.00
83 T	n-Propylbenzene	50.0000	54.2016	-8.4	94	0.00
84 T	Bromobenzene	50.0000	50.5175	-1.0	89	0.00
85 T	1,3,5-Trimethylbenzene	50.0000	53.7838	-7.6	93	0.00
86 T	2-Chlorotoluene	50.0000	49.8854	0.2	88	0.00
87 T	4-Chlorotoluene	50.0000	55.2536	-10.5	96	0.00
88 T	a-Methylstyrene	50.0000	50.4985	-1.0	95	0.00
89 T	tert-Butylbenzene	50.0000	50.3366	-0.7	92	0.00
90 T	1,2,4-Trimethylbenzene	50.0000	53.6679	-7.3	92	0.00
91 T	sec-Butylbenzene	50.0000	54.3436	-8.7	94	0.00
92 T	p-Isopropyltoluene	50.0000	54.1033	-8.2	93	0.00
93 T	1,3-Dichlorobenzene	50.0000	51.3957	-2.8	91	0.00
94 T	1,4-Dichlorobenzene	50.0000	50.4797	-1.0	89	0.00
95 T	n-Butylbenzene	50.0000	54.1948	-8.4	94	0.00
96 T	1,2-Dichlorobenzene	50.0000	49.7709	0.5	88	0.00
97 T	1,2-Dibromo-3-Chloropropane	50.0000	46.0909	7.8	76	0.00
98 T	1,2,4-Trichlorobenzene	50.0000	49.6219	0.8	86	0.00
99 T	Hexachlorobutadiene	50.0000	50.2810	-0.6	90	0.00
100 T	Naphthalene	50.0000	48.9390	2.1	79	0.00
101 T	1,2,3-Trichlorobenzene	50.0000	48.6989	2.6	83	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0
 8M418190.D 8260WT.M Tue Mar 07 11:10:47 2017

Page 2

2.1.1.5 Raw QC Data

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\120816\8M416518.D Vial: 1
 Acq On : 8 Dec 2016 8:55 Operator: TMB
 Sample : WG594051-01 50ng BFB STD A9/FOO Inst : HPMS8
 Misc : 1,1 STD78995 Multiplr: 1.00
 MS Integration Params: rteint.p
 Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\A9FOOWTR.M (RTE Integrator)
 Title : A9-FOO Water SOP:MSV01 12-08-16 HPMS8



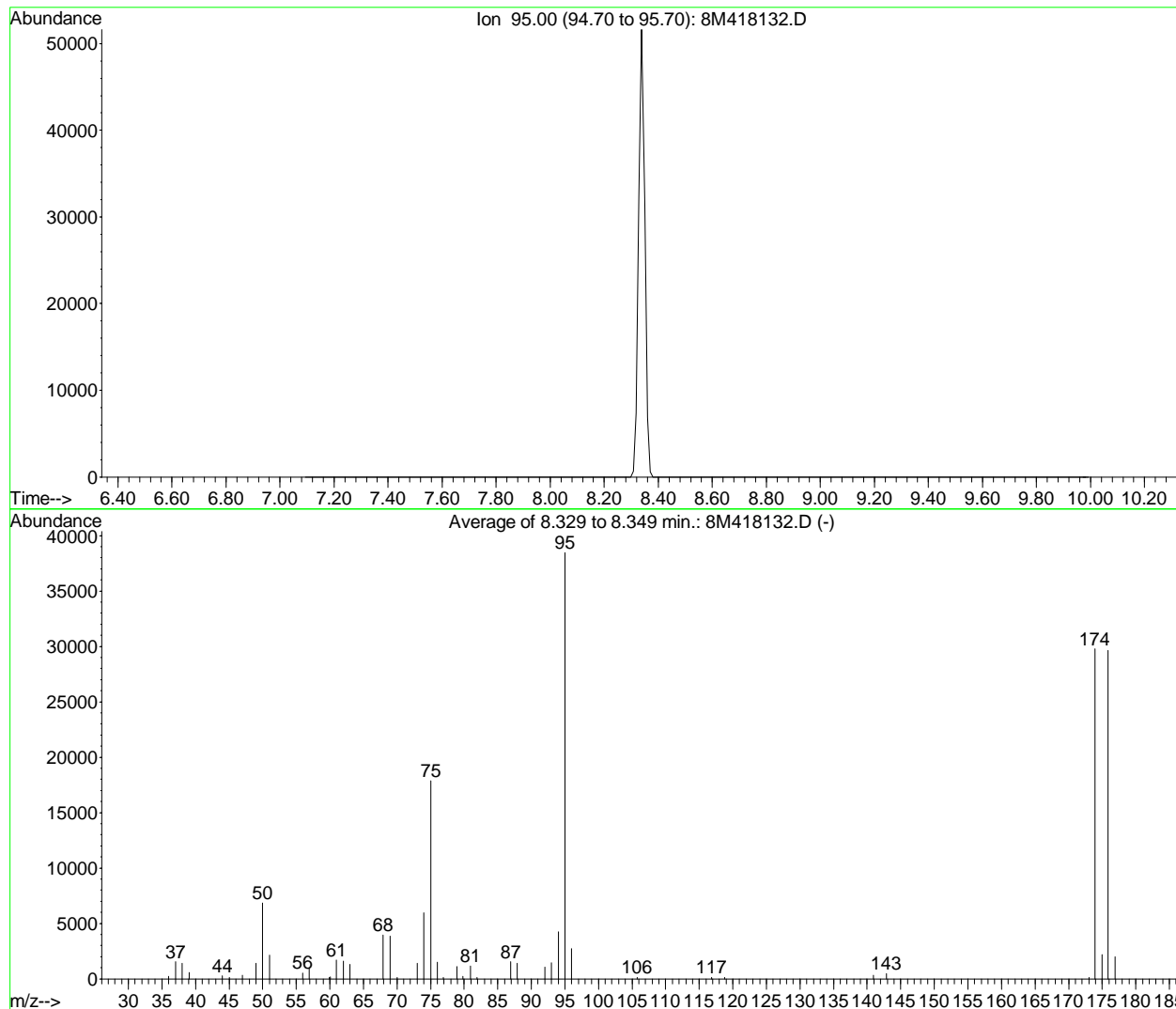
AutoFind: Scans 122, 123, 124; Background Corrected with Scan 117

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.9	3959	PASS
75	95	30	60	50.2	12523	PASS
95	95	100	100	100.0	24967	PASS
96	95	5	9	6.6	1651	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	74.9	18700	PASS
175	174	5	9	7.2	1355	PASS
176	174	95	101	96.0	17959	PASS
177	176	5	9	6.1	1092	PASS

8M416518.D A9FOOWTR.M Thu Dec 08 14:42:12 2016

BFB

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030317\8M418132.D Vial: 1
 Acq On : 3 Mar 2017 8:58 Operator: TMB
 Sample : WG604846-01 50ng BFB STD 8260 Inst : HPMS8
 Misc : 1,1 STD80536 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8



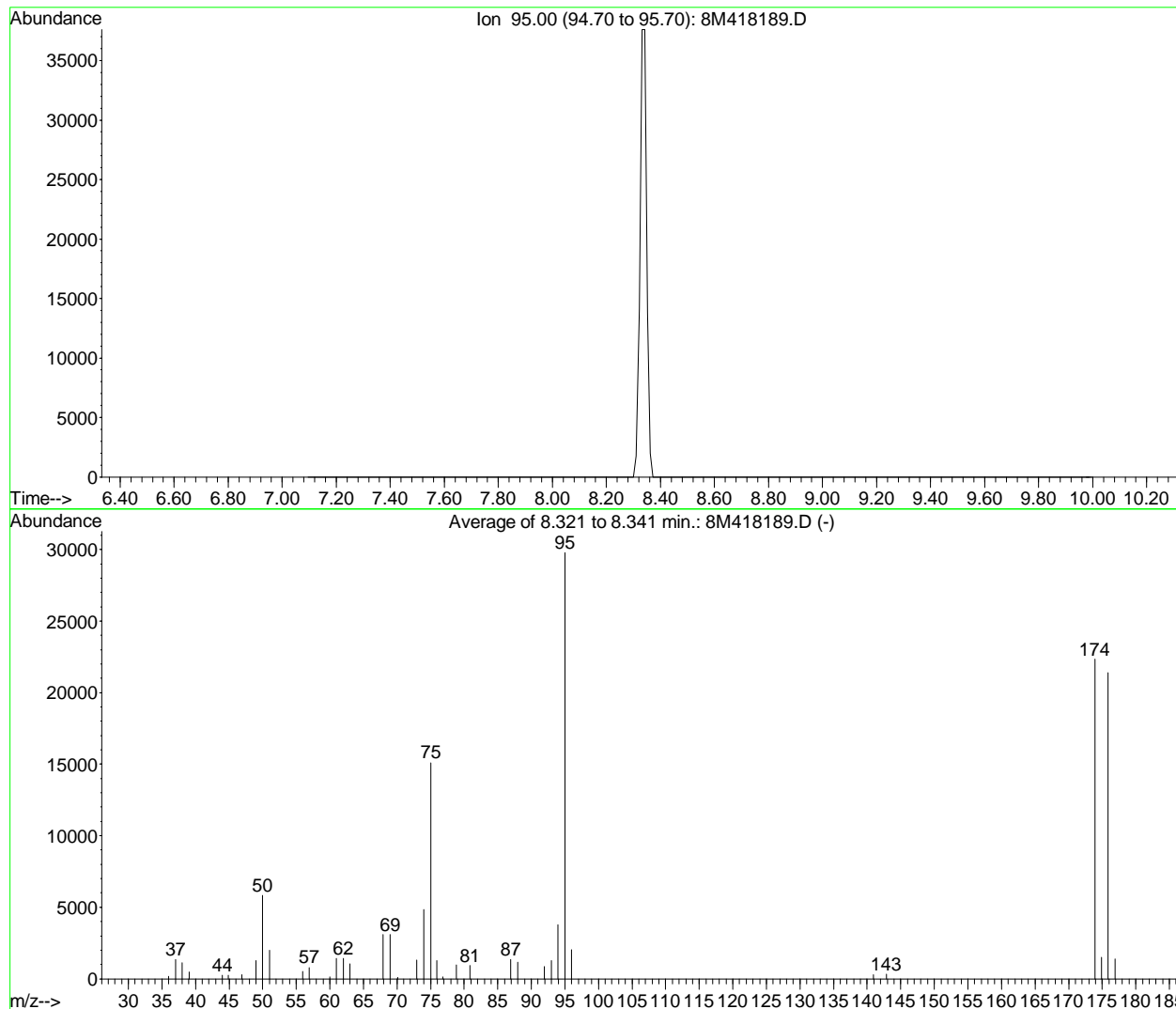
AutoFind: Scans 122, 123, 124; Background Corrected with Scan 117

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	17.7	6821	PASS
75	95	30	60	46.5	17889	PASS
95	95	100	100	100.0	38477	PASS
96	95	5	9	7.1	2727	PASS
173	174	0.00	2	0.4	114	PASS
174	95	50	100	77.4	29800	PASS
175	174	5	9	7.4	2204	PASS
176	174	95	101	99.5	29642	PASS
177	176	5	9	6.7	1979	PASS

8M418132.D 8260WT.M Mon Mar 06 12:31:59 2017

BFB

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418189.D Vial: 2
 Acq On : 7 Mar 2017 10:13 Operator: TMB
 Sample : WG605280-01 50ng BFB STD 8260 Inst : HPMS8
 Misc : 1,1 STD80536 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8



AutoFind: Scans 121, 122, 123; Background Corrected with Scan 117

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	19.5	5812	PASS
75	95	30	60	50.7	15111	PASS
95	95	100	100	100.0	29794	PASS
96	95	5	9	6.9	2046	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	75.0	22351	PASS
175	174	5	9	6.8	1519	PASS
176	174	95	101	95.8	21409	PASS
177	176	5	9	6.5	1382	PASS

8M418189.D 8260WT.M Tue Mar 07 11:10:23 2017

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418192.D Vial: 4
 Acq On : 7 Mar 2017 11:36 Operator: TMB
 Sample : WG605281-01 VBLK0307 BLANK STD 8260 Inst : HPMS8
 Misc : 1,1 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 13:59:47 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	617093	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	472940	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.87	152	245647	25.00	ug/L	0.00

System Monitoring Compounds	R.T.	QIon	Response	Conc	Units	Dev(Min)
37) Dibromofluoromethane	9.91	111	145340	22.9324	ug/L	0.00
Spiked Amount	25.000	Range	86 - 118	Recovery	=	91.72%
43) 1,2-Dichloroethane-d4	10.55	65	130142	23.4293	ug/L	0.00
Spiked Amount	25.000	Range	80 - 120	Recovery	=	93.72%
58) Toluene-d8	12.94	98	527871	23.7328	ug/L	0.00
Spiked Amount	25.000	Range	88 - 110	Recovery	=	94.92%
80) p-Bromofluorobenzene	16.34	95	204692	24.0751	ug/L	0.00
Spiked Amount	25.000	Range	86 - 115	Recovery	=	96.32%

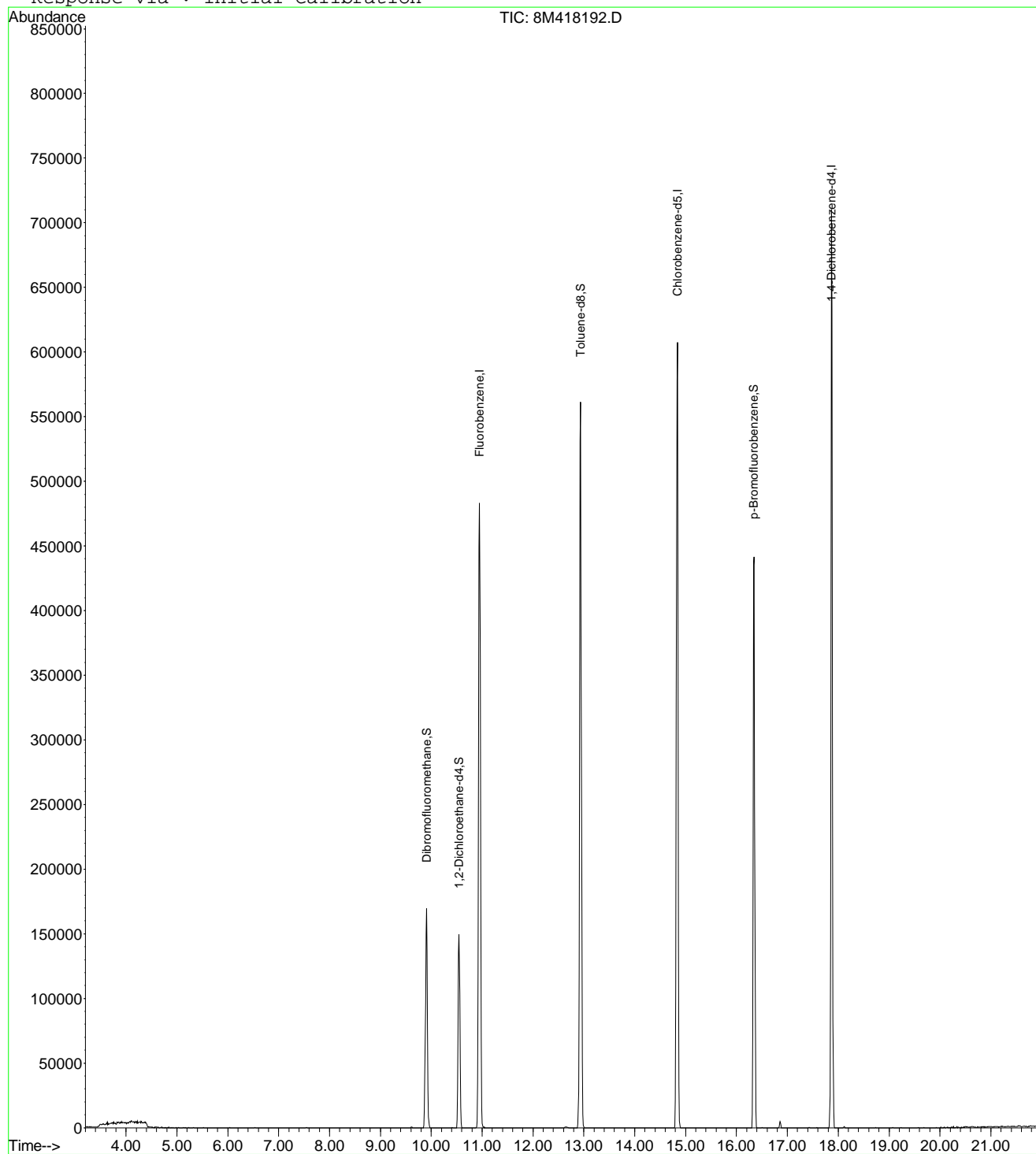
Target Compounds Qvalue

 (#) = qualifier out of range (m) = manual integration
 8M418192.D 8260WT.M Tue Mar 07 13:59:49 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418192.D Vial: 4
Acq On : 7 Mar 2017 11:36 Operator: TMB
Sample : WG605281-01 VBLK0307 BLANK STD 8260 Inst : HPMS8
Misc : 1,1 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 7 13:59 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Mon Mar 06 12:17:52 2017
Response via : Initial Calibration



8M418192.D 8260WT.M

Tue Mar 07 13:59:50 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418193.D Vial: 5
 Acq On : 7 Mar 2017 12:05 Operator: TMB
 Sample : WG605281-02 20ug/L LCS STD 8260 Inst : HPMS8
 Misc : 1,1 STD80757 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 07 12:33:44 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	630276	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	496660	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	272325	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.91	111	150317	23.2217	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	92.88%	
43) 1,2-Dichloroethane-d4	10.55	65	133492	23.5297	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	94.12%	
58) Toluene-d8	12.93	98	545537	23.3557	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	93.44%	
80) p-Bromofluorobenzene	16.35	95	221552	23.5053	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	94.04%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.34	85	194744	23.0798	ug/L	99
3) Chloromethane	3.83	50	274597	22.9867	ug/L	100
4) Vinyl Chloride	4.05	62	228741	21.9506	ug/L	99
5) 1,3-Butadiene	4.09	54	99237	19.6072	ug/L	96
6) Bromomethane	4.96	94	86703	17.6869	ug/L	99
7) Chloroethane	5.13	64	96623	21.7132	ug/L	99
8) Trichlorofluoromethane	5.61	101	217482	20.1869	ug/L	99
9) Diethyl ether	6.14	59	385435	92.0864	ug/L	99
10) Isoprene	6.18	67	189352	19.6369	ug/L	97
11) Acrolein	6.38	56	38596	68.5200	ug/L	99
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	130899	20.8516	ug/L	98
13) Acetone	6.49	43	15358	19.1968	ug/L	97
14) 1,1-Dichloroethene	6.71	61	176886	18.3873	ug/L	95
15) Tert-Butyl Alcohol	6.81	59	54293	210.6194	ug/L	99
16) Dimethyl Sulfide	6.98	62	130014	18.2113	ug/L	98
17) Iodomethane	7.23	142	76690	13.1335	ug/L	95
18) Methyl acetate	7.24	43	46214	19.2496	ug/L	97
19) Methylene Chloride	7.50	84	124750	18.6995	ug/L	98
20) Carbon Disulfide	7.54	76	292593	14.2574	ug/L	99
21) Acrylonitrile	7.67	53	24286	20.5564	ug/L	98
22) Methyl Tert Butyl Ether	7.70	73	238320	19.2332	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	174545	18.8174	ug/L	96
24) n-Hexane	8.02	57	147000	16.5319	ug/L	99
25) Diisopropyl ether	8.35	45	1832120	96.8723	ug/L	98
26) Vinyl Acetate	8.53	43	145695	20.5187	ug/L	98
27) 1,1-Dichloroethane	8.56	63	224234	19.1408	ug/L	100
28) Ethyl-Tert-Butyl ether	8.93	59	1603499	92.1479	ug/L	100
29) 2-Butanone	9.12	43	24668	18.6321	ug/L	99
30) Propionitrile	9.22	54	44396	105.1545	ug/L	97
31) 2,2-Dichloropropane	9.34	77	183988	18.5296	ug/L	100
32) cis-1,2-Dichloroethene	9.41	96	142305	19.6489	ug/L	90
33) Chloroform	9.62	83	231624	18.8466	ug/L	99
34) 1-Bromopropane	9.75	122	35511	25.2488	ug/L	99
35) Bromochloromethane	9.85	130	81523	20.6708	ug/L	98
36) Tetrahydrofuran	9.87	42	85778	102.0950	ug/L	99
38) 1,1,1-Trichloroethane	10.15	97	204381	19.6410	ug/L	99
39) Cyclohexane	10.18	56	207833	18.8551	ug/L	99
40) 1,1-Dichloropropene	10.34	75	168287	18.9934	ug/L	98
41) Tert-Amyl-Methyl ether	10.44	73	1424252	98.6669	ug/L	100
42) Carbon Tetrachloride	10.49	117	186501	19.5033	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418193.D 8260WT.M Tue Mar 07 12:33:46 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418193.D Vial: 5
 Acq On : 7 Mar 2017 12:05 Operator: TMB
 Sample : WG605281-02 20ug/L LCS STD 8260 Inst : HPMS8
 Misc : 1,1 STD80757 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 12:33:44 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

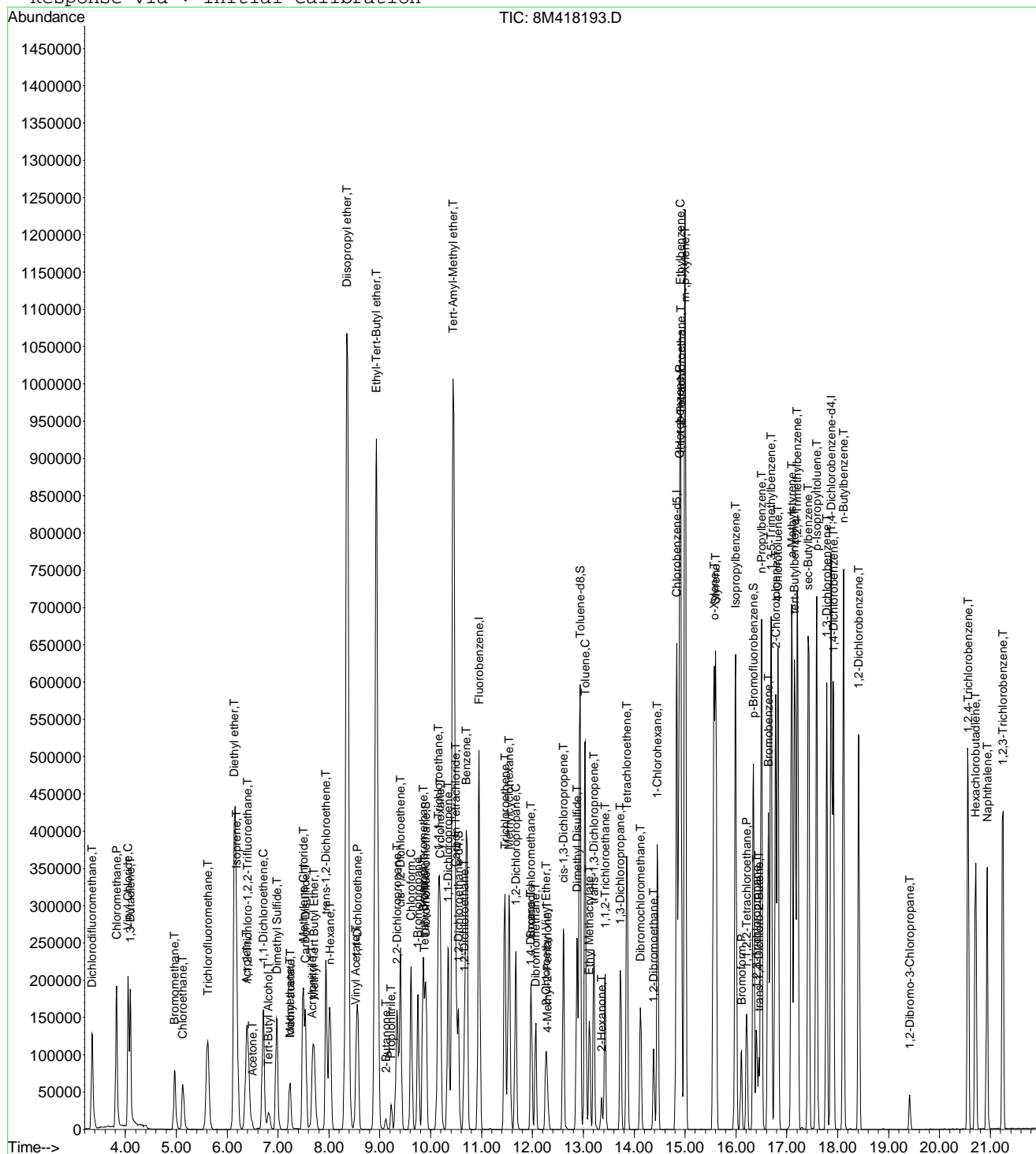
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	147398	19.9139	ug/L	99
46) Benzene	10.70	78	504262	19.7336	ug/L	98
47) Trichloroethene	11.46	130	139471	18.8235	ug/L	98
48) Methylcyclohexane	11.54	83	214084	19.3494	ug/L	98
49) 1,2-Dichloropropane	11.67	63	125354	19.5855	ug/L	93
50) Bromodichloromethane	11.97	83	161375	19.1084	ug/L	100
51) 1,4-Dioxane	11.96	88	5469	176.6498	ug/L	100
52) Dibromomethane	12.06	93	66454	20.7038	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	54641	19.1362	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	23687	18.6693	ug/L	96
55) cis-1,3-Dichloropropene	12.60	75	200896	20.6971	ug/L	100
56) Dimethyl Disulfide	12.87	79	100234	18.9283	ug/L	95
59) Toluene	13.04	91	543401	19.4331	ug/L	98
60) Ethyl Methacrylate	13.12	69	111849	18.9019	ug/L	93
62) trans-1,3-Dichloropropene	13.20	75	160509	19.2037	ug/L	99
63) 1,1,2-Trichloroethane	13.43	97	89816	19.6267	ug/L	100
64) 2-Hexanone	13.36	58	21059	17.8819	ug/L	98
65) 1,3-Dichloropropane	13.73	76	156923	20.2258	ug/L	94
66) Tetrachloroethene	13.85	164	113697	18.8691	ug/L	94
67) Dibromochloromethane	14.12	129	114736	19.2098	ug/L	99
68) 1,2-Dibromoethane	14.38	107	90063	20.0830	ug/L	99
69) 1-Chlorohexane	14.45	91	187263	19.2811	ug/L	97
70) Chlorobenzene	14.89	112	372916	18.3801	ug/L	95
71) 1,1,1,2-Tetrachloroethane	14.92	131	133903	18.3935	ug/L	100
72) Ethylbenzene	14.91	106	205005	17.8999	ug/L	95
73) m-,p-Xylene	15.00	106	501117	38.1909	ug/L	95
74) o-Xylene	15.57	106	241281	18.3655	ug/L	98
75) Styrene	15.60	104	413234	19.9954	ug/L	94
76) Bromoform	16.11	173	67723	17.5047	ug/L	99
77) Isopropylbenzene	16.00	105	621045	19.3000	ug/L	99
79) 1,1,2,2-Tetrachloroethane	16.21	83	105818	20.9560	ug/L	100
81) 1,2,3-Trichloropropane	16.41	110	29864	20.3674	ug/L	93
82) trans-1,4-Dichloro-2-Butene	16.45	53	27532	18.2681	ug/L	94
83) n-Propylbenzene	16.50	91	753814	19.3417	ug/L	98
84) Bromobenzene	16.64	156	161758	19.1025	ug/L	94
85) 1,3,5-Trimethylbenzene	16.69	105	542276	19.4387	ug/L	98
86) 2-Chlorotoluene	16.78	91	483471	18.3890	ug/L	99
87) 4-Chlorotoluene	16.82	91	451483	19.6828	ug/L	99
88) a-Methylstyrene	17.09	118	305170	18.8144	ug/L	99
89) tert-Butylbenzene	17.15	134	116377	18.0806	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	572568	19.7243	ug/L	97
91) sec-Butylbenzene	17.42	105	701856	19.5047	ug/L	99
92) p-Isopropyltoluene	17.59	119	593777	19.6606	ug/L	100
93) 1,3-Dichlorobenzene	17.78	146	325609	19.0357	ug/L	96
94) 1,4-Dichlorobenzene	17.92	146	323276	19.0244	ug/L	97
95) n-Butylbenzene	18.11	91	575755	19.8147	ug/L	99
96) 1,2-Dichlorobenzene	18.41	146	292829	19.3287	ug/L	95
97) 1,2-Dibromo-3-Chloropropane	19.42	75	16263	19.3135	ug/L	95
98) 1,2,4-Trichlorobenzene	20.57	180	211821	19.1809	ug/L	99
99) Hexachlorobutadiene	20.71	225	96077	18.5206	ug/L	97
100) Naphthalene	20.94	128	363071	20.9596	ug/L	100
101) 1,2,3-Trichlorobenzene	21.25	180	180113	19.7130	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418193.D 8260WT.M Tue Mar 07 12:33:46 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418193.D Vial: 5
 Acq On : 7 Mar 2017 12:05 Operator: TMB
 Sample : WG605281-02 20ug/L LCS STD 8260 Inst : HPMS8
 Misc : 1,1 STD80757 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 7 12:33 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration



Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418194.D Vial: 6
 Acq On : 7 Mar 2017 12:35 Operator: TMB
 Sample : WG605281-03 20ug/L LCS2 STD 8260 Inst : HPMS8
 Misc : 1,1 STD80757 Multiplr: 1.00

MS Integration Params: RTEINT.P

Quant Time: Mar 07 13:59:19 2017

Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	10.95	96	650606	25.00	ug/L	0.00
57) Chlorobenzene-d5	14.84	117	512195	25.00	ug/L	0.00
78) 1,4-Dichlorobenzene-d4	17.88	152	281255	25.00	ug/L	0.00

System Monitoring Compounds

37) Dibromofluoromethane	9.90	111	156417	23.4089	ug/L	0.00
Spiked Amount	25.000	Range 86 - 118	Recovery	=	93.64%	
43) 1,2-Dichloroethane-d4	10.55	65	139188	23.7671	ug/L	0.00
Spiked Amount	25.000	Range 80 - 120	Recovery	=	95.08%	
58) Toluene-d8	12.93	98	566034	23.4982	ug/L	0.00
Spiked Amount	25.000	Range 88 - 110	Recovery	=	94.00%	
80) p-Bromofluorobenzene	16.35	95	226029	23.2189	ug/L	0.00
Spiked Amount	25.000	Range 86 - 115	Recovery	=	92.88%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethane	3.34	85	216243	24.8269	ug/L	100
3) Chloromethane	3.83	50	295876	23.9940	ug/L	99
4) Vinyl Chloride	4.05	62	246522	22.9177	ug/L	100
5) 1,3-Butadiene	4.09	54	103547	19.8528	ug/L	98
6) Bromomethane	4.97	94	100366	19.7489	ug/L	99
7) Chloroethane	5.13	64	107339	23.3676	ug/L	97
8) Trichlorofluoromethane	5.61	101	237157	21.3253	ug/L	99
9) Diethyl ether	6.14	59	400134	92.6110	ug/L	99
10) Isoprene	6.18	67	210768	21.1748	ug/L	98
11) Acrolein	6.38	56	41013	70.5358	ug/L	98
12) 1,1,2-Trichloro-1,2,2-Trif	6.40	101	142659	22.0148	ug/L	96
13) Acetone	6.48	43	16322	19.7642	ug/L	99
14) 1,1-Dichloroethene	6.71	61	193996	19.5357	ug/L	94
15) Tert-Butyl Alcohol	6.81	59	53610	201.4712	ug/L	99
16) Dimethyl Sulfide	6.97	62	138886	18.8462	ug/L	97
17) Iodomethane	7.23	142	99016	16.0909	ug/L	94
18) Methyl acetate	7.24	43	47778	19.2792	ug/L	97
19) Methylene Chloride	7.49	84	134440	19.5223	ug/L	96
20) Carbon Disulfide	7.54	76	322003	15.2002	ug/L	99
21) Acrylonitrile	7.67	53	24742	20.2880	ug/L	95
22) Methyl Tert Butyl Ether	7.70	73	248138	19.3998	ug/L	99
23) trans-1,2-Dichloroethene	7.94	61	191519	20.0021	ug/L	96
24) n-Hexane	8.01	57	165328	18.0121	ug/L	97
25) Diisopropyl ether	8.35	45	1951116	99.9405	ug/L	98
26) Vinyl Acetate	8.53	43	145140	19.8018	ug/L	100
27) 1,1-Dichloroethane	8.56	63	244813	20.2445	ug/L	99
28) Ethyl-Tert-Butyl ether	8.93	59	1687670	93.9543	ug/L	100
29) 2-Butanone	9.12	43	25451	18.6229	ug/L	98
30) Propionitrile	9.22	54	44067	101.1138	ug/L	99
31) 2,2-Dichloropropane	9.34	77	198842	19.3998	ug/L	100
32) cis-1,2-Dichloroethene	9.41	96	151182	20.2223	ug/L	92
33) Chloroform	9.62	83	248879	19.6178	ug/L	100
34) 1-Bromopropane	9.75	122	38286	26.3712	ug/L	98
35) Bromochloromethane	9.84	130	85270	20.9453	ug/L	98
36) Tetrahydrofuran	9.87	42	84277	97.1741	ug/L	98
38) 1,1,1-Trichloroethane	10.15	97	226601	21.0959	ug/L	98
39) Cyclohexane	10.17	56	229062	20.1317	ug/L	98
40) 1,1-Dichloropropene	10.34	75	184002	20.1181	ug/L	97
41) Tert-Amyl-Methyl ether	10.44	73	1482130	99.4680	ug/L	99
42) Carbon Tetrachloride	10.49	117	202419	20.5064	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418194.D 8260WT.M Tue Mar 07 13:59:22 2017

Page 1

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418194.D Vial: 6
 Acq On : 7 Mar 2017 12:35 Operator: TMB
 Sample : WG605281-03 20ug/L LCS2 STD 8260 Inst : HPMS8
 Misc : 1,1 STD80757 Multiplr: 1.00
 MS Integration Params: RTEINT.P
 Quant Time: Mar 07 13:59:19 2017 Quant Results File: 8260WT.RES

Quant Method : K:\ORGANICS\V...\8260WT.M (RTE Integrator)
 Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
 Last Update : Mon Mar 06 12:17:52 2017
 Response via : Initial Calibration
 DataAcq Meth : 8260WT

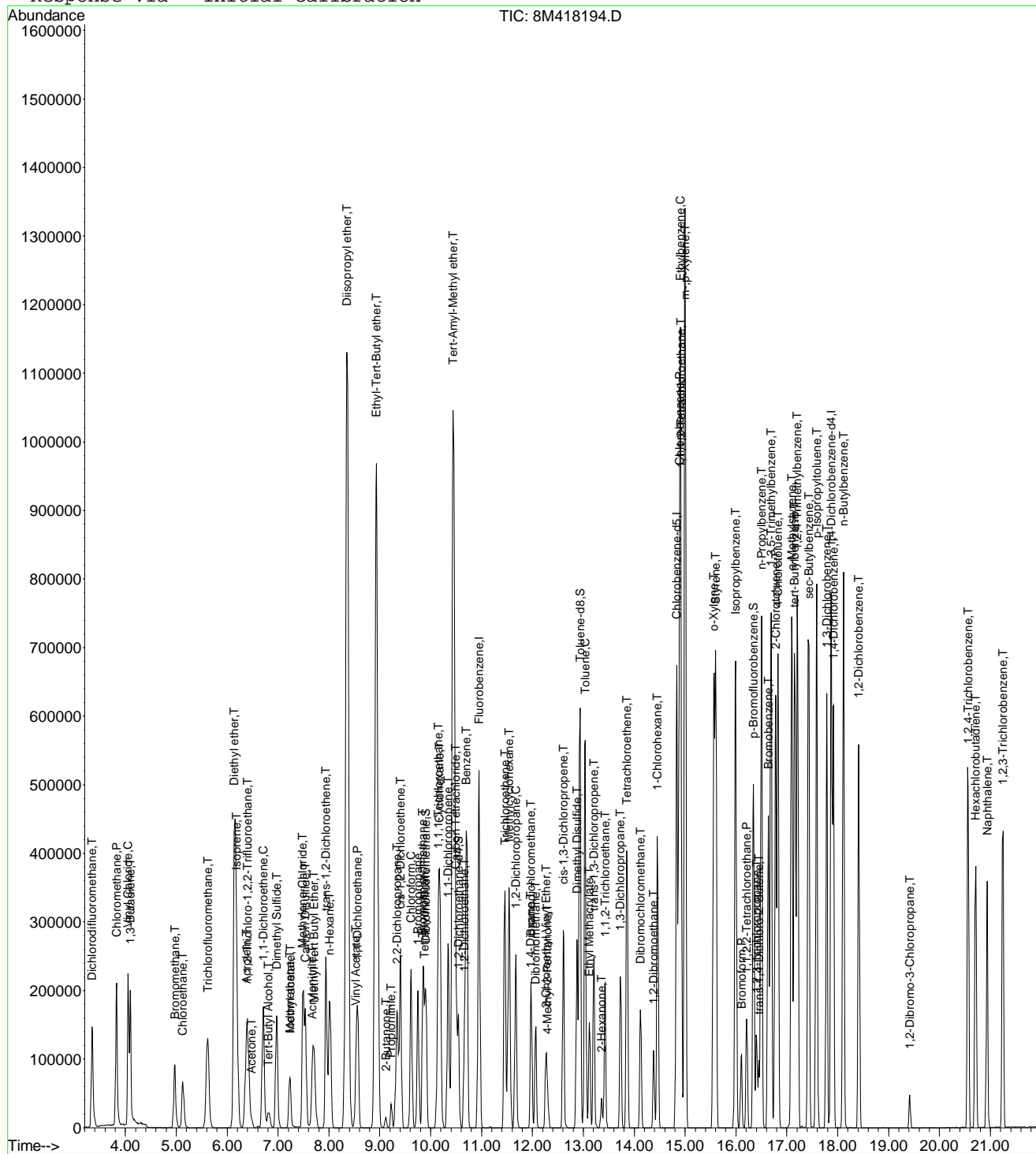
Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45) 1,2-Dichloroethane	10.66	62	155452	20.3457	ug/L	99
46) Benzene	10.70	78	539550	20.4547	ug/L	98
47) Trichloroethene	11.46	130	152553	19.9457	ug/L	98
48) Methylcyclohexane	11.54	83	233743	20.4661	ug/L	99
49) 1,2-Dichloropropane	11.67	63	131424	19.8922	ug/L	96
50) Bromodichloromethane	11.97	83	172985	19.8431	ug/L	100
51) 1,4-Dioxane	11.96	88	6259	195.8497	ug/L	100
52) Dibromomethane	12.06	93	69399	20.9457	ug/L	96
53) 2-Chloroethyl Vinyl Ether	12.26	63	56031	19.0098	ug/L	100
54) 4-Methyl-2-Pentanone	12.29	58	24338	18.5830	ug/L	95
55) cis-1,3-Dichloropropene	12.60	75	211425	21.1012	ug/L	99
56) Dimethyl Disulfide	12.87	79	104875	19.1858	ug/L	94
59) Toluene	13.04	91	585471	20.3026	ug/L	98
60) Ethyl Methacrylate	13.12	69	117880	19.3046	ug/L	92
62) trans-1,3-Dichloropropene	13.20	75	168178	19.5109	ug/L	99
63) 1,1,2-Trichloroethane	13.43	97	92852	19.6747	ug/L	98
64) 2-Hexanone	13.36	58	21591	17.7776	ug/L	98
65) 1,3-Dichloropropane	13.73	76	166257	20.7790	ug/L	93
66) Tetrachloroethene	13.85	164	121598	19.5683	ug/L	96
67) Dibromochloromethane	14.12	129	121570	19.7366	ug/L	99
68) 1,2-Dibromoethane	14.38	107	94702	20.4770	ug/L	98
69) 1-Chlorohexane	14.45	91	204621	20.4294	ug/L	99
70) Chlorobenzene	14.89	112	401461	19.1869	ug/L	95
71) 1,1,1,2-Tetrachloroethane	14.92	131	142319	18.9566	ug/L	100
72) Ethylbenzene	14.91	106	221830	18.7814	ug/L	95
73) m-,p-Xylene	15.00	106	538577	39.8009	ug/L	94
74) o-Xylene	15.56	106	259862	19.1799	ug/L	99
75) Styrene	15.60	104	442309	20.7532	ug/L	94
76) Bromoform	16.11	173	71141	17.8200	ug/L	99
77) Isopropylbenzene	15.99	105	680486	20.5058	ug/L	97
79) 1,1,2,2-Tetrachloroethane	16.21	83	107050	20.5269	ug/L	99
81) 1,2,3-Trichloropropane	16.41	110	31364	20.7112	ug/L	91
82) trans-1,4-Dichloro-2-Butene	16.45	53	28494	18.3049	ug/L	91
83) n-Propylbenzene	16.50	91	820743	20.3903	ug/L	97
84) Bromobenzene	16.64	156	172180	19.6877	ug/L	93
85) 1,3,5-Trimethylbenzene	16.69	105	585600	20.3252	ug/L	99
86) 2-Chlorotoluene	16.78	91	525355	19.3476	ug/L	100
87) 4-Chlorotoluene	16.82	91	486661	20.5428	ug/L	100
88) a-Methylstyrene	17.09	118	327000	19.5202	ug/L	98
89) tert-Butylbenzene	17.15	134	127436	19.1701	ug/L	98
90) 1,2,4-Trimethylbenzene	17.20	105	611449	20.3949	ug/L	97
91) sec-Butylbenzene	17.43	105	764639	20.5748	ug/L	98
92) p-Isopropyltoluene	17.59	119	644603	20.6658	ug/L	99
93) 1,3-Dichlorobenzene	17.78	146	342874	19.4086	ug/L	97
94) 1,4-Dichlorobenzene	17.92	146	346171	19.7250	ug/L	96
95) n-Butylbenzene	18.11	91	620291	20.6696	ug/L	99
96) 1,2-Dichlorobenzene	18.41	146	308352	19.7071	ug/L	95
97) 1,2-Dibromo-3-Chloropropane	19.42	75	17026	19.5687	ug/L	93
98) 1,2,4-Trichlorobenzene	20.56	180	218685	19.1737	ug/L	98
99) Hexachlorobutadiene	20.71	225	101493	18.9434	ug/L	98
100) Naphthalene	20.94	128	367387	20.5354	ug/L	100
101) 1,2,3-Trichlorobenzene	21.25	180	183673	19.4643	ug/L	99

(#) = qualifier out of range (m) = manual integration
 8M418194.D 8260WT.M Tue Mar 07 13:59:22 2017

Page 2

Data File : K:\ORGANICS\VOLATILE\HPMS8\DATA\030717\8M418194.D Vial: 6
Acq On : 7 Mar 2017 12:35 Operator: TMB
Sample : WG605281-03 20ug/L LCS2 STD 8260 Inst : HPMS8
Misc : 1,1 STD80757 Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 7 13:59 2017 Quant Results File: 8260WT.RES

Method : K:\ORGANICS\VOLATILE\HPMS8\METHODS\8260WT.M (RTE Integrator)
Title : Method 8260B/624 WTR-SOP:OVLMSV01 03-03-17 HPMS8
Last Update : Mon Mar 06 12:17:52 2017
Response via : Initial Calibration



2.2 Semivolatiles Data

2.2.1 Semivolatiles GC/MS Data (Dioxane)

2.2.1.1 Summary Data

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3520C	Prep Date: 02/24/2017 16:11
Matrix: Water	Analytical Method: 8270D	Cal Date: 01/25/2017 13:43
Workgroup #: WG604416	Analyst: SCB/LJH	Run Date: 03/01/2017 20:19
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: 15M20613
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	21.6	J	2.38	1.19	0.595
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	73.0	20	129			
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17021201

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3520C	Prep Date: 02/24/2017 16:11
Matrix: Water	Analytical Method: 8270D	Cal Date: 01/25/2017 13:43
Workgroup #: WG604416	Analyst: SCB/LJH	Run Date: 03/02/2017 16:49
Collect Date: 02/22/2017 10:00	Dilution: 5	File ID: 15M20634
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	20.2		11.9	5.96	2.98
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	66.4	20	129			

2.2.1.2 QC Summary Data

Example 8270 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

where:

Ax = Area of the characteristic ion for the compound being measured:	1261197
Cis = Concentration of the specific internal standard (ug/mL)	40
Ais = Area of the characteristic ion of the specific internal standard	608044
Cx = Concentration of the compound in the standard being measured (ug/mL)	50
RF = Calculated Response Factor	1.65935

Example

2.0 Calculating the concentration (C) of a compound in water using the data from the prep log and quantitation report: *

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Vi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Vi = Initial volume of sample extracted from prep log (mL)	1021
Cx = Concentration of the compound in the sample being measured (ug/mL)	0.016947
Cx = Concentration of the compound in the sample being measured (ug/L)	16.947

Example

3.0 Calculating the concentration (C) of a compound in soil using the data from the prep log and quantitation report: *

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Wi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Wi = Initial weight of sample extracted (g) from prep log	30
Cx = Concentration of the compound in the sample being measured (ug/g)	0.576763
Cx = Concentration of the compound in the sample being measured (ug/kg)	576.7627

Example

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	1153.525 ug/kg

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve plot

b = intercept from curve plot

Step 2: Calculate y from Quantitation Report

y = 16790/784838 = 0.02139

Step 3: Solve for x

$$x = (y - b)/m = [(0.02139 - (-0.0435))/0.0783] = 0.829$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.829) = 20.72 \text{ ug/L}$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.0783
Intercept from curve, b:	-0.0435
Area of analyte, Ax:	16790
Area of Internal Standard, Ais:	784484
Concentration of IS, Cis	25.00 ug/L
Response Ratio (y) :	0.021403
Amount Ratio:	0.828897
Concentration (Cx):	20.72241 ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	0.0259
Value of B from plot:	0.0596
Value of C from plot:	-0.0165
Area of analyte from quantitation report:	203233
Area of IS from quantitation report:	1425653
Response ratio, y:	0.142554
C - y:	-0.15905
Root 1 - Computed amount ratio, X1:	-3.88278
Root 2 - Computed amount ratio, X2:	1.581623 use this solution
Concentration of IS, Cis:	40.00
Concentration of analyte, Cx:	63.26 ug/L

Workgroup: WG604087 TIME ON: 17:15 OFF: 11:15 ON: 12:30 OFF: 08:00
 Analyst: CPD Methylene Chloride Lot #: COA19452
 Spike Analyst: CPD Sodium Sulfate , Anhydrous , Granul Lot # COA19381
 Method: 3520C 1:1 H2SO4 Lot #: RGT38950
 Run Date: 02/24/2017 16:11 10N NaOH Lot #: RGT39114
 SOP: EXB01 Revision 20
 Spike Witness: JDH
 Surr Solution: STD80323

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L17021201-01	SAMP		827-DIOXANE<2>12		840 mL	.05 mL			1 mL	Transparent
2	L17021253-01	SAMP		827-DIOXANE<2>12		880 mL	.05 mL			1 mL	Colored
3	L17021253-03	SAMP		827-DIOXANE<2>12		900 mL	.05 mL			1 mL	Colored
4	L17021253-05	SAMP		827-DIOXANE<2>12		870 mL	.05 mL			1 mL	Colored
5	L17021261-01	SAMP		827-DIOXANE<2>12		980 mL	.05 mL			1 mL	Transparent
6	L17021261-02	SAMP		827-DIOXANE<2>12		910 mL	.05 mL			1 mL	Transparent
7	L17021261-03	SAMP		827-DIOXANE<2>12		940 mL	.05 mL			1 mL	Transparent
8	L17021261-04	SAMP		827-DIOXANE<2>12		950 mL	.05 mL			1 mL	Transparent
9	L17021261-05	SAMP		827-DIOXANE<2>12		920 mL	.05 mL			1 mL	Colored
10	L17021262-01	SAMP		827-DIOXANE<2>12		910 mL	.05 mL			1 mL	Transparent
11	L17021262-02	SAMP		827-DIOXANE<2>12		930 mL	.05 mL			1 mL	Colored
12	L17021262-03	SAMP		827-DIOXANE<2>12		930 mL	.05 mL			1 mL	Transparent
13	L17021262-04	SAMP		827-DIOXANE<2>12		810 mL	.05 mL			1 mL	Transparent
14	L17021324-01	SAMP		827-DIOXANE<2>12		870 mL	.05 mL			1 mL	Transparent
15	L17021324-02	SAMP		827-DIOXANE<2>12		860 mL	.05 mL			1 mL	Colored
16	L17021324-03	RS01		827-DIOXANE<2>12		860 mL	.05 mL			1 mL	Transparent
17	L17021324-04	MS01	L17021324-03	827-DIOXANE<2>12		930 mL	.05 mL	.05 mL	STD79978	1 mL	Colored
18	L17021324-05	SD01	L17021324-03	827-DIOXANE<2>12		980 mL	.05 mL	.05 mL	STD79978	1 mL	Colored
19	L17021324-06	SAMP		827-DIOXANE<2>12		910 mL	.05 mL			1 mL	Transparent
20	L17021324-07	SAMP		827-DIOXANE<2>12		930 mL	.05 mL			1 mL	Colored
21	L17021327-01	SAMP		827-DIOXANE<2>12		920 mL	.05 mL			1 mL	Colored
22	WG604087-01	BLANK		827-DIOXANE<2>12		1000 mL	.05 mL			1 mL	Transparent
23	WG604087-02	LCS		827-DIOXANE<2>12		1000 mL	.05 mL	.05 mL	STD79978	1 mL	Colored
24	WG604087-03	REF	L17021324-03	827-DIOXANE<2>12		860 mL	.05 mL			1 mL	Transparent
25	WG604087-04	MS	L17021324-03	827-DIOXANE<2>12		930 mL	.05 mL	.05 mL	STD79978	1 mL	Colored
26	WG604087-05	MSD	L17021324-03	827-DIOXANE<2>12		980 mL	.05 mL	.05 mL	STD79978	1 mL	Colored

pH 0-3 Lot#230515
 pH 10-12 Lot#219813
 TV2P5

Analyst: *Robert Davis*

Reviewer: *Justin Harrison*



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 012517
 Analyst1: LJH Analyst2: MES
 Method: 8270C/D SOP: MSS01 Rev: 27

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
WG600070 (ICAL, WG599844)
 Internal STD: STD80096 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M20443	RINSE W/IS	1	1		01/25/17 10:36
2	15M20444	WG600070-01 5PPM LL DFTPP	1	1	STD77832	01/25/17 10:55
3	15M20445	WG600070-02 5PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 11:26
4	15M20446	WG600070-02 5PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 11:50
5	15M20447	WG600070-03 10PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 12:12
6	15M20448	WG600070-04 7.5PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 12:35
7	15M20449	WG600070-05 2.5PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 12:58
8	15M20450	WG600070-06 1PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 13:21
9	15M20451	WG600070-07 0.4PPM 1,4-DIOXANE STD	1	1	STD80097	01/25/17 13:43
10	15M20452	WG600070-08 5PPM 1,4-DIOXANE ALT STD	1	1	STD80098	01/25/17 14:18
11	15M20453	WG599586-01 BLANK	7	1		01/25/17 14:53
12	15M20454	L17010007-05 DOC 827-DIOX	7	1		01/25/17 15:16
13	15M20455	L17010007-06 DOC 827-DIOX	7	1		01/25/17 15:39
14	15M20456	L17010007-07 DOC 827-DIOX	7	1		01/25/17 16:02
15	15M20457	L17010007-08 DOC 827-DIOX	7	1		01/25/17 16:24

Comments

Seq.	Rerun	Dil.	Reason	Analytes
3				
			WG600070-02 5PPM 1,4-DIOXANE STD Do not report. SIM window was adjusted for 1,4-dioxane.	

Page: 1

Approved: 26-JAN-17

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 030117
 Analyst1: LJH Analyst2: SCB
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: WG604416
 Column 1 ID: RXI-5MS Column 2 ID: NA
 Internal STD: STD80096 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: The injector tower errored after running the REF sample. The REF and the rest of the samples will have to re-run.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M20594	BAKE OUT	1	1		03/01/17 13:09
2	15M20595	WG604649-01 5PPM LL DFTPP	1	1	STD80383	03/01/17 13:32
3	15M20596	WG604649-02 5PPM DIOX STD	1	1	STD80097	03/01/17 13:50
4	15M20597	WG604087-01 BLANK	1	1	STD80097	03/01/17 14:14
5	15M20598	WG604087-02 LCS	1	1		03/01/17 14:37
6	15M20599	L17021253-01 827-DIOXANE	1	1		03/01/17 15:00
7	15M20600	L17021253-03 827-DIOXANE	1	1		03/01/17 15:23
8	15M20601	L17021253-05 827-DIOXANE	1	1		03/01/17 15:46
9	15M20602	L17021261-01 827-DIOXANE	1	1		03/01/17 16:08
10	15M20603	L17021253-01 50X 827-DIOXANE	1	50		03/01/17 16:31
11	15M20604	L17021261-02 827-DIOXANE	1	1		03/01/17 16:54
12	15M20605	L17021261-03 827-DIOXANE	1	1		03/01/17 17:17
13	15M20606	L17021261-04 827-DIOXANE	1	1		03/01/17 17:39
14	15M20607	L17021261-05 10X 827-DIOXANE	1	10		03/01/17 18:02
15	15M20608	L17021261-05 20X 827-DIOXANE	1	20		03/01/17 18:25
16	15M20609	L17021262-01 827-DIOXANE	1	1		03/01/17 18:48
17	15M20610	L17021262-02 827-DIOXANE	1	1		03/01/17 19:10
18	15M20611	L17021262-03 827-DIOXANE	1	1		03/01/17 19:33
19	15M20612	L17021262-04 827-DIOXANE	1	1		03/01/17 19:56
20	15M20613	L17021201-01 827-DIOXANE	1	1		03/01/17 20:19
21	15M20614	L17021324-01 827-DIOXANE	1	1		03/01/17 20:41
22	15M20615	L17021324-02 827-DIOXANE	1	1		03/01/17 21:04
23	15M20616	L17021324-03 REF 827-DIOXANE	1	1		03/01/17 21:26

Comments

Seq.	Rerun	Dil.	Reason	Analytes
6	X	5	Over Calibration Range	2
			L17021253-01 827-DIOXANE IS low, DNR.	
7	X	10	Over Calibration Range	2
			L17021253-03 827-DIOXANE	
8	X	40	Over Calibration Range	2
			L17021253-05 827-DIOXANE IS low, DNR.	
9	X	2	Over Calibration Range	2

Page: 1

Approved: 03-MAR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 030117
 Analyst1: LJH Analyst2: SCB
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
 WG604416
 Internal STD: STD80096 Surrogate STD: NA
 CCV STD: STD80097 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
				L17021261-01 827-DIOXANE
10	X	20	Analyzed too dilute	
				L17021253-01 50X 827-DIOXANE
13	X	20	Over Calibration Range	2
				L17021261-04 827-DIOXANE
15				
			L17021261-05 20X: Not needed or reported.	
17	X	10	Over Calibration Range	2
				L17021262-02 827-DIOXANE
19	X	5	Over Calibration Range	2
				L17021262-04 827-DIOXANE
20	X	2	Over Calibration Range	2
				L17021201-01 827-DIOXANE
22	X	20	Over Calibration Range	2
				L17021324-02 827-DIOXANE
23	X	20	Over Calibration Range	2
				L17021324-03 REF 827-DIOXANE DNR

Page: 2

Approved: 03-MAR-17

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 030217
 Analyst1: LJH Analyst2: SCB
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: WG604416
 Column 1 ID: RXI-5MS Column 2 ID: NA
 Internal STD: STD80096 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M20617	BAKE OUT	1	1		03/02/17 09:37
2	15M20618	WG604728-01 5PPM LL DFTPP	1	1	STD80383	03/02/17 09:57
3	15M20619	WG604728-01 5PPM LL DFTPP	1	1	STD80383	03/02/17 11:12
4	15M20620	WG604728-02 5PPM DIOX STD	1	1	STD80097	03/02/17 11:29
5	15M20621	L17021324-03 REF 20X 827-DIOXANE	1	20		03/02/17 11:52
6	15M20622	WG604087-04 MS 20X 827-DIOXANE	1	20		03/02/17 12:15
7	15M20623	WG604087-05 MSD 20X 827-DIOXANE	1	20		03/02/17 12:37
8	15M20624	L17021324-06 827-DIOXANE	1	1		03/02/17 13:00
9	15M20625	L17021324-07 10X 827-DIOXANE	1	10		03/02/17 13:23
10	15M20626	L17021324-07 20X 827-DIOXANE	1	20		03/02/17 13:45
11	15M20627	L17021327-01 10X 827-DIOXANE	1	10		03/02/17 14:08
12	15M20628	L17021253-03 10X 827-DIOXANE	1	10		03/02/17 14:31
13	15M20629	L17021253-05 40X 827-DIOXANE	1	40		03/02/17 14:53
14	15M20630	L17021261-01 2X 827-DIOXANE	1	2		03/02/17 15:16
15	15M20631	L17021261-04 20X 827-DIOXANE	1	20		03/02/17 15:41
16	15M20632	L17021262-02 10X 827-DIOXANE	1	10		03/02/17 16:03
17	15M20633	L17021262-04 5X 827-DIOXANE	1	5		03/02/17 16:26
18	15M20634	L17021201-01 5X 827-DIOXANE	1	5		03/02/17 16:49
19	15M20635	L17021324-02 20X 827-DIOXANE	1	20		03/02/17 17:12
20	15M20636	L17021327-01 5X 827-DIOXANE	1	5		03/02/17 17:34
21	15M20637	BAKE OUT	1	1		03/02/17 17:57
22	15M20638	BAKE OUT	1	1		03/02/17 18:20
23	15M20639	BAKE OUT	1	1		03/02/17 18:42

Comments

Seq.	Rerun	Dil.	Reason	Analytes
6				
			WG604087-04 MS 20X 827-DIOXANE low recovery; spike was diluted out due to necessary sample dilution.	
7				
			WG604087-05 MSD 20X 827-DIOXANE low recovery; spike was diluted out due to necessary sample dilution.	
9	X		Over Calibration Range	2
			L17021324-07 10X 827-DIOXANE	
11	X		Analyzed too dilute	2

Page: 1

Approved: 03-MAR-17

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 030217
 Analyst1: LJH Analyst2: SCB
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG604416
 Internal STD: STD80096 Surrogate STD: NA
 CCV STD: STD80097 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
20				

Page: 2

Approved: 03-MAR-17




Microbac Laboratories Inc.

Data Checklist

Date: 25-JAN-2017
 Analyst: LJH
 Analyst: MES
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 80051
 Analytical Workgroups: WG600070, L17010007

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
26-JAN-2017

Lacey J. Bendoric

Secondary Reviewer:
26-JAN-2017

Mary Schilling



Microbac Laboratories Inc.

Data Checklist

Date: 01-MAR-2017
 Analyst: LJH
 Analyst: SCB
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 80748
 Analytical Workgroups: L17021253, L17011261, L17011262, L17011201, L17011324

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
02-MAR-2017

Racey J. Bendorshot

Secondary Reviewer:
03-MAR-2017

Eri C. Zimm



Microbac Laboratories Inc.

Data Checklist

Date: 02-MAR-2017
 Analyst: LJH
 Analyst: SCB
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 80747
 Analytical Workgroups: L17021201, -1253, -1261, -1262, -1324, -1327

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	NA
TCL hits	NA
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
03-MAR-2017

Lacey J. Bendorshot

Secondary Reviewer:
03-MAR-2017

Mary Schilling



Analytical Method:8270D
Login Number:L17021201

AAB#:WG604416

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6418-GRAB	01	02/22/17					02/24/2017	2.3	7		03/01/17	5.2	40	
LH18/24-SP650-6418-GRAB	01	02/22/17					02/24/2017	2.3	7		03/02/17	6	40	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID:5180884
Report generated 03/03/2017 13:14



Login Number:L17021201
Instrument Id:HPMS15
Workgroup (AAB#):WG604416

Method:827-DIOXANE
CAL ID: HPMS15-25-JAN-17
Matrix:Water

Sample Number	Dilution	Tag	1
L17021201-01	1.00	01	73.0
L17021201-01	5.00	DL01	66.4
WG604087-01	1.00	01	61.5
WG604087-02	1.00	01	51.7

Surrogates	Surrogate Limits
1 - 1,4-Dioxane-d8	20 - 129

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17021201 Work Group: WG604416
 Blank File ID: 15M20597 Blank Sample ID: WG604087-01
 Prep Date: 02/24/17 16:11 Instrument ID: HPMS15
 Analyzed Date: 03/01/17 14:14 Method: 8270D
 Analyst: SCB/LJH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG604087-02	15M20598	03/01/17 14:37	01
LH18/24-SP650-6418-GRAB	L17021201-01	15M20613	03/01/17 20:19	01
LH18/24-SP650-6418-GRAB	L17021201-01	15M20634	03/02/17 16:49	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5180885
 Report generated 03/03/2017 13:14



Login Number: L17021201 Prep Date: 02/24/17 16:11 Sample ID: WG604087-01
 Instrument ID: HPMS15 Run Date: 03/01/17 14:14 Prep Method: 3520C
 File ID: 15M20597 Analyst: SCB/LJH Method: 8270D
 Workgroup (AAB#): WG604416 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS15-25-JAN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,4-Dioxane	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	61.5	20 - 129	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5180886
 03-MAR-2017 13:14



Login Number: L17021201 Run Date: 03/01/2017 Sample ID: WG604087-02
 Instrument ID: HPMS15 Run Time: 14:37 Prep Method: 3520C
 File ID: 15M20598 Analyst: SCB/LJH Method: 8270D
 Workgroup (AAB#): WG604416 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD79978 Cal ID: HPMS15-25-JAN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,4-Dioxane	5.00	2.58	51.5	30 - 104	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	51.7	20 - 129	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5180887
 Report generated: 03/03/2017 13:14



DFTPP

Login Number: L17021201 Tune ID: WG600070-01
 Instrument: HPMS15 Run Date: 01/25/2017
 Analyst: LJH/MES Run Time: 10:55
 Workgroup: WG600070 File ID: 15M20444
 Cal ID: HPMS15-25-JAN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	36.0	93844	PASS
68.0	69.0	0	2.00	1.83	1752	PASS
69.0	198	0	100	36.7	95703	PASS
70.0	69.0	0	2.00	0.303	290	PASS
127	198	40.0	60.0	47.7	124552	PASS
197	198	0	1.00	0.300	783	PASS
198	198	100	100	100	261013	PASS
199	198	5.00	9.00	6.87	17926	PASS
275	198	10.0	30.0	25.5	66533	PASS
365	198	1.00	100	3.31	8631	PASS
441	443	0.0100	100	71.8	32016	PASS
442	198	40.0	100	87.6	228651	PASS
443	442	17.0	23.0	19.5	44595	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG600070-02	STD-CCV	01	01/25/2017 11:50	
WG600070-03	STD	01	01/25/2017 12:12	
WG600070-04	STD	01	01/25/2017 12:35	
WG600070-05	STD	01	01/25/2017 12:58	
WG600070-06	STD	01	01/25/2017 13:21	
WG600070-07	STD	01	01/25/2017 13:43	
WG600070-08	SSCV	01	01/25/2017 14:18	

* Sample past 12 hour tune limit



DFTPP

Login Number: L17021201 Tune ID: WG604649-01
 Instrument: HPMS15 Run Date: 03/01/2017
 Analyst: SCB/LJH Run Time: 13:32
 Workgroup: WG604649 File ID: 15M20595
 Cal ID: HPMS15-25-JAN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	34.2	55192	PASS
68.0	69.0	0	2.00	1.65	982	PASS
69.0	198	0	100	36.8	59512	PASS
70.0	69.0	0	2.00	0.854	508	PASS
127	198	40.0	60.0	49.3	79552	PASS
197	198	0	1.00	0.692	1118	PASS
198	198	100	100	100	161515	PASS
199	198	5.00	9.00	6.84	11052	PASS
275	198	10.0	30.0	26.3	42459	PASS
365	198	1.00	100	3.34	5399	PASS
441	443	0.0100	100	74.1	18491	PASS
442	198	40.0	100	77.9	125893	PASS
443	442	17.0	23.0	19.8	24940	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG604649-02	CCV	01	03/01/2017 13:50	
WG604087-01	BLANK	01	03/01/2017 14:14	
WG604087-02	LCS	01	03/01/2017 14:37	
L17021201-01	LH18/24-SP650-6418-GRAB	01	03/01/2017 20:19	

* Sample past 12 hour tune limit



DFTPP

Login Number: L17021201 Tune ID: WG604728-01
 Instrument: HPMS15 Run Date: 03/02/2017
 Analyst: SCB/LJH Run Time: 11:12
 Workgroup: WG604728 File ID: 15M20619
 Cal ID: HPMS15-25-JAN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	31.7	118945	PASS
68.0	69.0	0	2.00	1.49	1930	PASS
69.0	198	0	100	34.6	129709	PASS
70.0	69.0	0	2.00	0.596	773	PASS
127	198	40.0	60.0	47.3	177664	PASS
197	198	0	1.00	0.588	2206	PASS
198	198	100	100	100	375270	PASS
199	198	5.00	9.00	6.42	24085	PASS
275	198	10.0	30.0	26.1	97889	PASS
365	198	1.00	100	3.04	11395	PASS
441	443	0.0100	100	72.3	43960	PASS
442	198	40.0	100	81.2	304640	PASS
443	442	17.0	23.0	20.0	60808	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG604728-02	CCV	01	03/02/2017 11:29	
L17021201-01	LH18/24-SP650-6418-GRAB	DL01	03/02/2017 16:49	

* Sample past 12 hour tune limit



Login Number: L17021201
Analytical Method: 8270D
ICAL Workgroup: WG600070

Instrument ID: HPMS15
Initial Calibration Date: 25-JAN-17 13:43
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
1,4-Dioxane	0.2924	0.993		

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5180888
Report generated 03/03/2017 13:14



Login Number: L17021201
Analytical Method: 8270D

Instrument ID: HPMS15
Initial Calibration Date: 25-JAN-17 13:43
Column ID: F

Analyte	WG600070-02			WG600070-03			WG600070-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	5.00	148140.000	0.2922	10.0	281569.000	0.2959	7.50	231497.000	0.2933

INT_CAL - Modified 03/06/2008
PDF File ID: 5180888
Report generated 03/03/2017 13:14



Login Number: L17021201
 Analytical Method: 8270D

Instrument ID: HPMS15
 Initial Calibration Date: 25-JAN-17 13:43
 Column ID: F

Analyte	WG600070-05			WG600070-06			WG600070-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	2.50	71344.0000	0.2901	1.00	27390.0000	0.2946	0.400	10787.0000	0.2881

INT_CAL - Modified 03/06/2008
 PDF File ID: 5180888
 Report generated 03/03/2017 13:14



Login Number: L17021201 Run Date: 01/25/2017 Sample ID: WG600070-08
 Instrument ID: HPMS15 Run Time: 14:18 Method: 8270D
 File ID: 15M20452 Analyst: LJH/MES QC Key: DOD4
 ICal Workgroup: WG600070 Cal ID: HPMS15 - 25-JAN-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,4-Dioxane	5000	4610	ug/L	0.270	7.80	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17021201 Run Date: 03/01/2017 Sample ID: WG604649-02
 Instrument ID: HPMS15 Run Time: 13:50 Method: 8270D
 File ID: 15M20596 Analyst: SCB/LJH QC Key: DOD4
 Workgroup (AAB#): WG604416 Cal ID: HPMS15 - 25-JAN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dioxane	5000	4540	ug/L	0.266	9.15	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5180891
 Report generated 03/03/2017 13:15



Login Number: L17021201 Run Date: 03/02/2017 Sample ID: WG604728-02
 Instrument ID: HPMS15 Run Time: 11:29 Method: 8270D
 File ID: 15M20620 Analyst: SCB/LJH QC Key: DOD4
 Workgroup (AAB#): WG604416 Cal ID: HPMS15 - 25-JAN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dioxane	5000	4430	ug/L	0.259	11.3	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5180891
 Report generated 03/03/2017 13:15



Login Number: L17021201
Instrument ID: HPMS15
Workgroup (AAB#): WG604416

ICAL CCV Number: WG600070-02
CAL ID: HPMS15-25-JAN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG600070-02	NA	NA	101405
Upper Limit	NA	NA	202810
Lower Limit	NA	NA	50703
<u>L17021201-01</u>	1.00	01	107314
<u>L17021201-01</u>	5.00	DL01	141946
WG604087-01	1.00	01	56747
WG604087-02	1.00	01	58088

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00842460

Login Number: L17021201
Instrument ID: HPMS15
Workgroup (AAB#): WG604416

ICAL CCV Number: WG600070-02
CAL ID: HPMS15-25-JAN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG600070-02	NA	NA	7.19
Upper Limit	NA	NA	7.69
Lower Limit	NA	NA	6.69
<u>L17021201-01</u>	1.00	01	7.194
<u>L17021201-01</u>	5.00	DL01	7.154
WG604087-01	1.00	01	7.198
WG604087-02	1.00	01	7.198

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



2.2.1.3 Sample Data

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20613.D
 Acq On : 1 Mar 2017 8:19 pm
 Operator : SCB/LJH
 Sample : L17021201-01 827-DIOXANE
 Misc : 1,1
 ALS Vial : 18 Sample Multiplier: 1

Quant Time: Mar 02 15:27:34 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

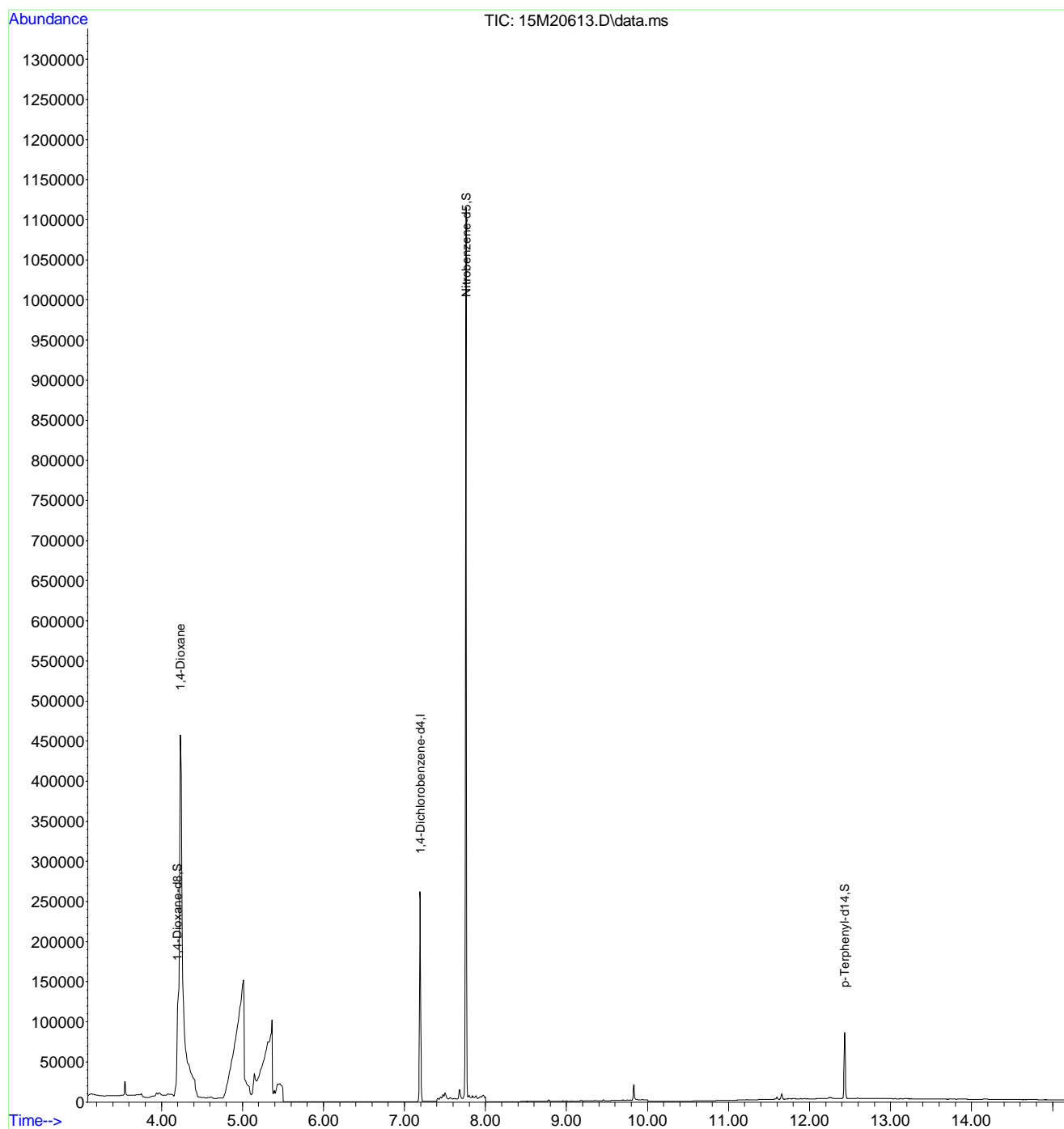
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.194	152	107314	1.0000	ug/mL	# 0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.201	96	135804	3.6490	ug/L	0.05
Spiked Amount	5.000		Recovery	=	73.00%	
4) Nitrobenzene-d5	7.759	82	955437	10.7960	ug/L	0.09
Spiked Amount	5.000		Recovery	=	216.00%	
5) 2-Fluorobiphenyl	9.184	172	585	0.0024	ug/L	0.01
Spiked Amount	5.000		Recovery	=	0.00%	
6) p-Terphenyl-d14	12.435	244	71483	0.2604	ug/L	0.02
Spiked Amount	5.000		Recovery	=	5.20%	
Target Compounds						
2) 1,4-Dioxane	4.236	58	570292	18.1761	ug/L	Qvalue 77

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

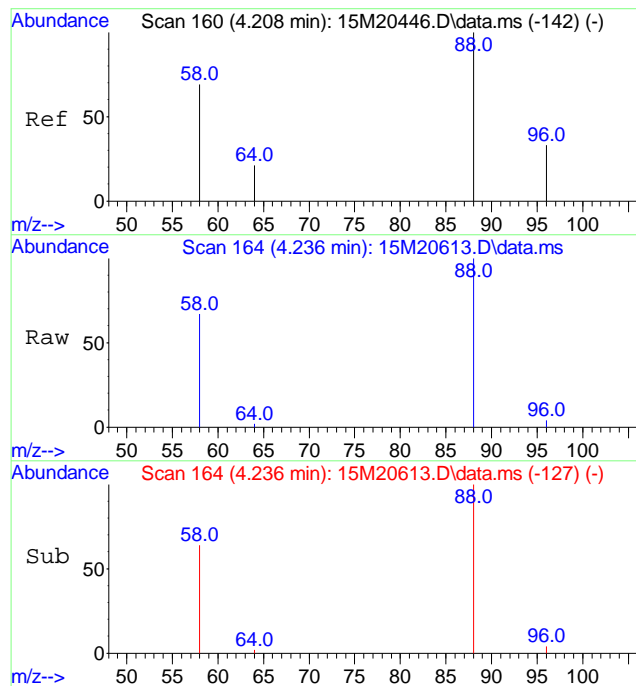
Data Path : C:\msdchem\1\data\030117\
Data File : 15M20613.D
Acq On : 1 Mar 2017 8:19 pm
Operator : SCB/LJH
Sample : L17021201-01 827-DIOXANE
Misc : 1,1
ALS Vial : 18 Sample Multiplier: 1

Quant Time: Mar 02 15:27:34 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration



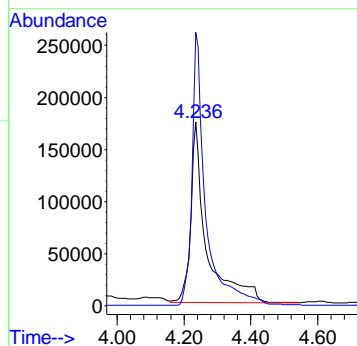
DIOXANE_D8.M Thu Mar 02 15:27:35 2017

Page: 2



#2
1,4-Dioxane
Concen: 18.18 ug/L
RT: 4.236 min Scan# 164
Delta R.T. 0.050 min
Lab File: 15M20613.D
Acq: 1 Mar 2017 8:19 pm

Tgt Ion: 58 Resp: 570292
Ion Ratio Lower Upper
58 100
88 129.4 127.3 190.9



Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20634.D
 Acq On : 2 Mar 2017 4:49 pm
 Operator : SCB/LJH
 Sample : L17021201-01 5X 827-DIOXANE
 Misc : 1,5
 ALS Vial : 16 Sample Multiplier: 5

Quant Time: Mar 03 09:28:59 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

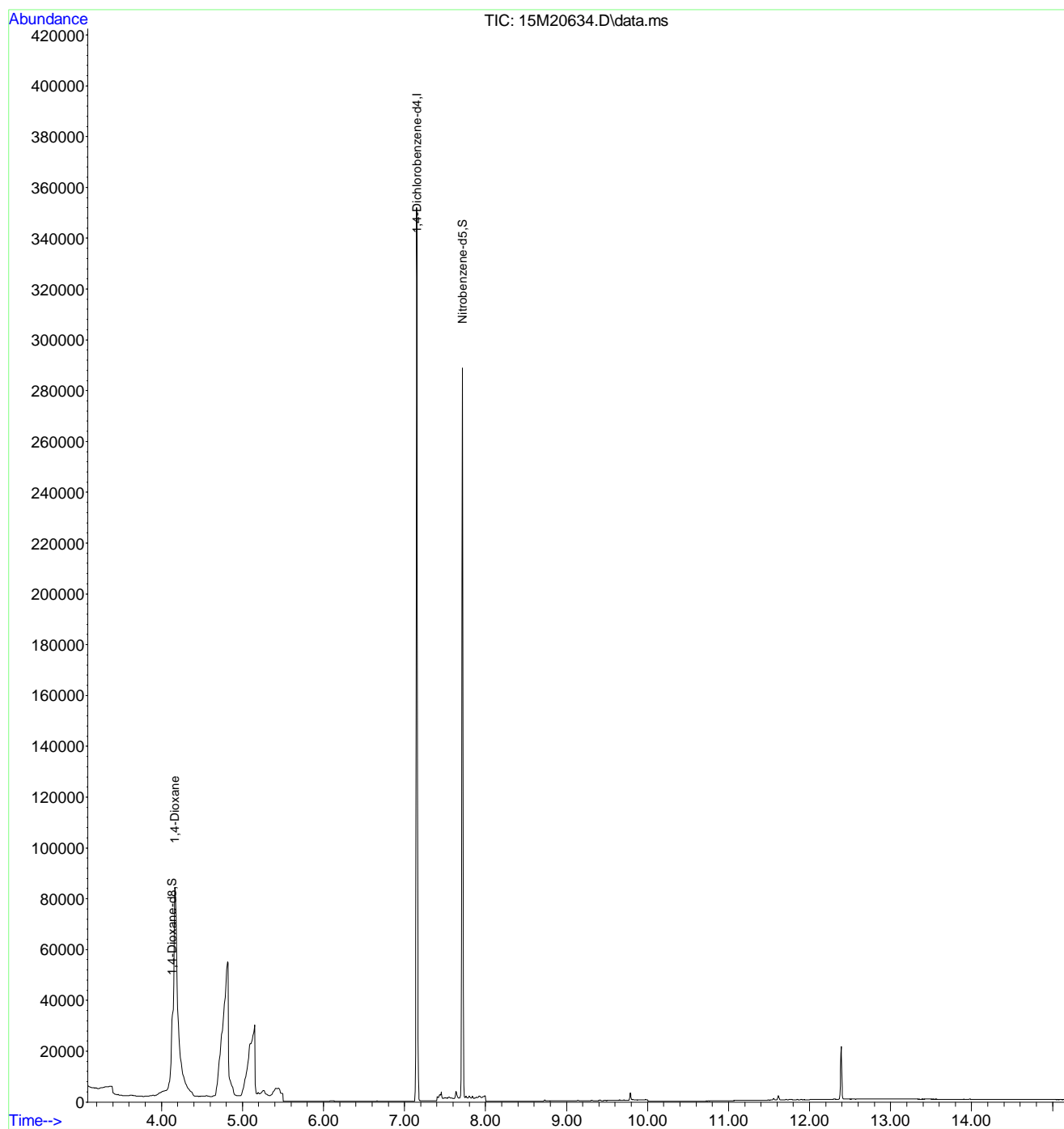
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.154	152	141946	1.0000	ug/mL	#-0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.130	96	32693	3.3206	ug/L	-0.02
Spiked Amount	5.000		Recovery	=	66.40%	
4) Nitrobenzene-d5	7.716	82	239456	10.2280	ug/L	0.05
Spiked Amount	5.000		Recovery	=	204.60%	
5) 2-Fluorobiphenyl	9.144	172	183	0.0028	ug/L	-0.03
Spiked Amount	5.000		Recovery	=	0.00%	
6) p-Terphenyl-d14	12.391	244	17366	0.2391	ug/L	-0.03
Spiked Amount	5.000		Recovery	=	4.80%	
Target Compounds						
2) 1,4-Dioxane	4.165	58	141024	3.3981	ug/L	# 75

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

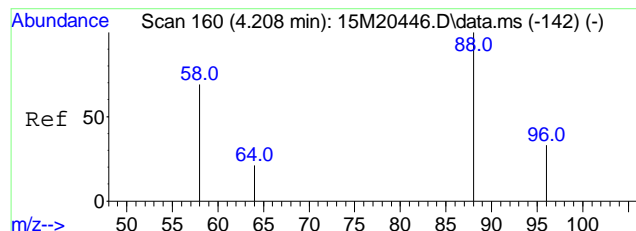
Data Path : C:\msdchem\1\data\030217\
Data File : 15M20634.D
Acq On : 2 Mar 2017 4:49 pm
Operator : SCB/LJH
Sample : L17021201-01 5X 827-DIOXANE
Misc : 1,5
ALS Vial : 16 Sample Multiplier: 5

Quant Time: Mar 03 09:28:59 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration



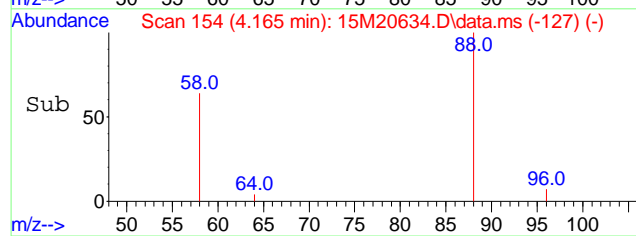
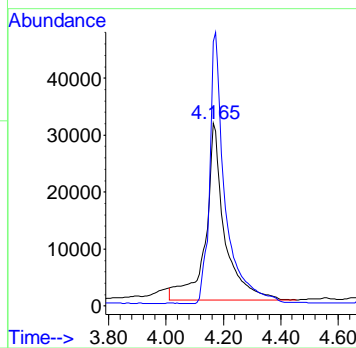
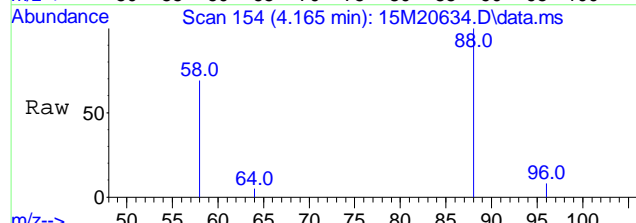
DIOXANE_D8.M Fri Mar 03 09:28:59 2017

Page: 2



#2
 1,4-Dioxane
 Concen: 3.40 ug/L
 RT: 4.165 min Scan# 154
 Delta R.T. -0.021 min
 Lab File: 15M20634.D
 Acq: 2 Mar 2017 4:49 pm

Tgt Ion	Ratio	Lower	Upper
58	100		
88	126.8	127.3	190.9#



2.2.1.4 Standards Data

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20446.D
 Acq On : 25 Jan 2017 11:50 am
 Operator : LJH/MES
 Sample : WG600070-02 5PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

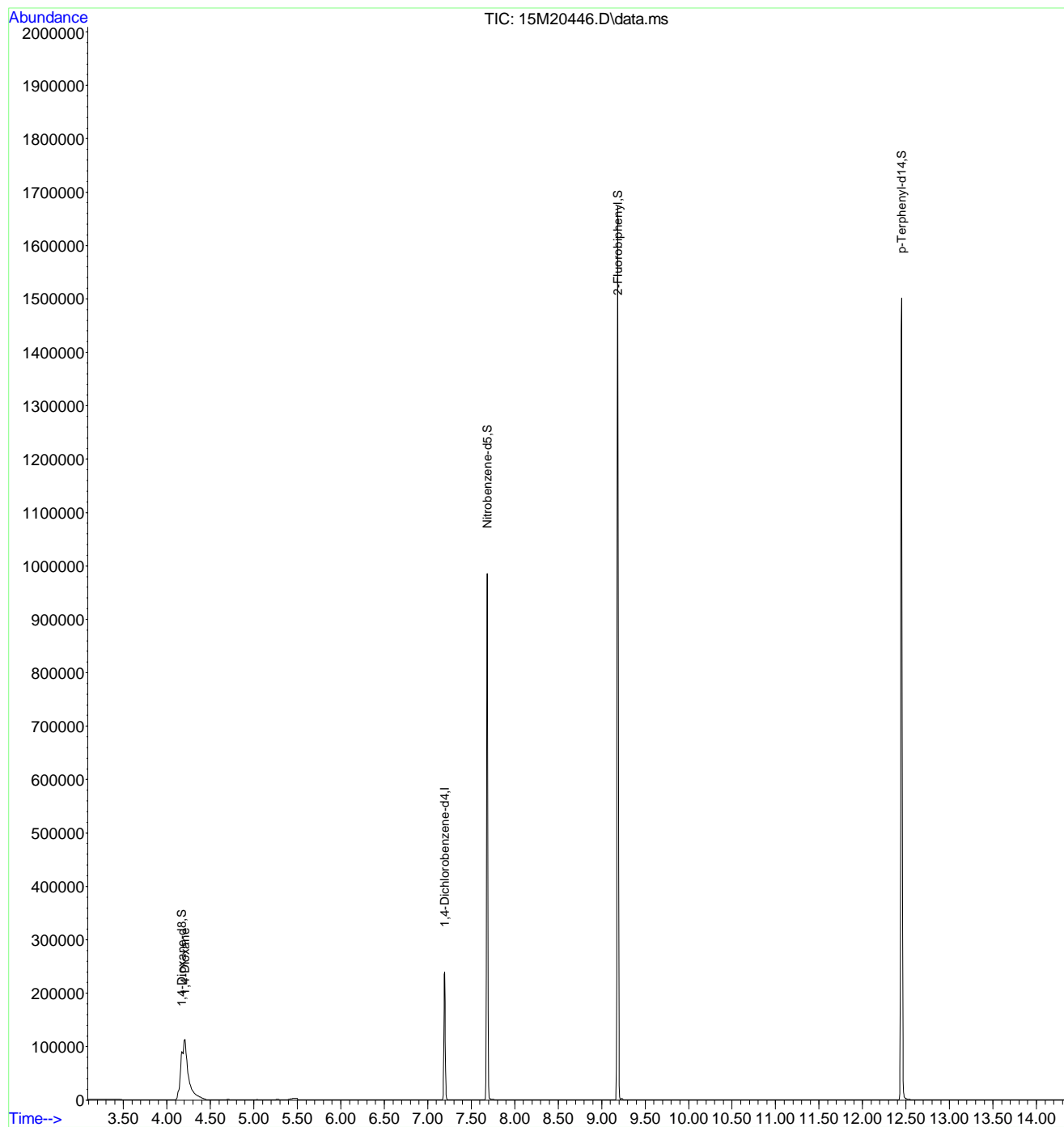
Quant Time: Jan 25 14:10:34 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.194	152	101405	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.172	96	174782	4.1499	ug/L	0.00
Spiked Amount	5.000		Recovery	=	83.00%	
4) Nitrobenzene-d5	7.684	82	454924	3.5939	ug/L	0.00
Spiked Amount	5.000		Recovery	=	71.80%	
5) 2-Fluorobiphenyl	9.184	172	1169720	4.9042	ug/L	0.00
Spiked Amount	5.000		Recovery	=	98.00%	
6) p-Terphenyl-d14	12.449	244	1332375	6.2446	ug/L	0.00
Spiked Amount	5.000		Recovery	=	124.80%	
Target Compounds						
2) 1,4-Dioxane	4.208	58	148140	4.8216	ug/L	# 1

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20446.D
Acq On : 25 Jan 2017 11:50 am
Operator : LJH/MES
Sample : WG600070-02 5PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jan 25 14:10:34 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20447.D
 Acq On : 25 Jan 2017 12:12 pm
 Operator : LJH/MES
 Sample : WG600070-03 10PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jan 25 14:10:36 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

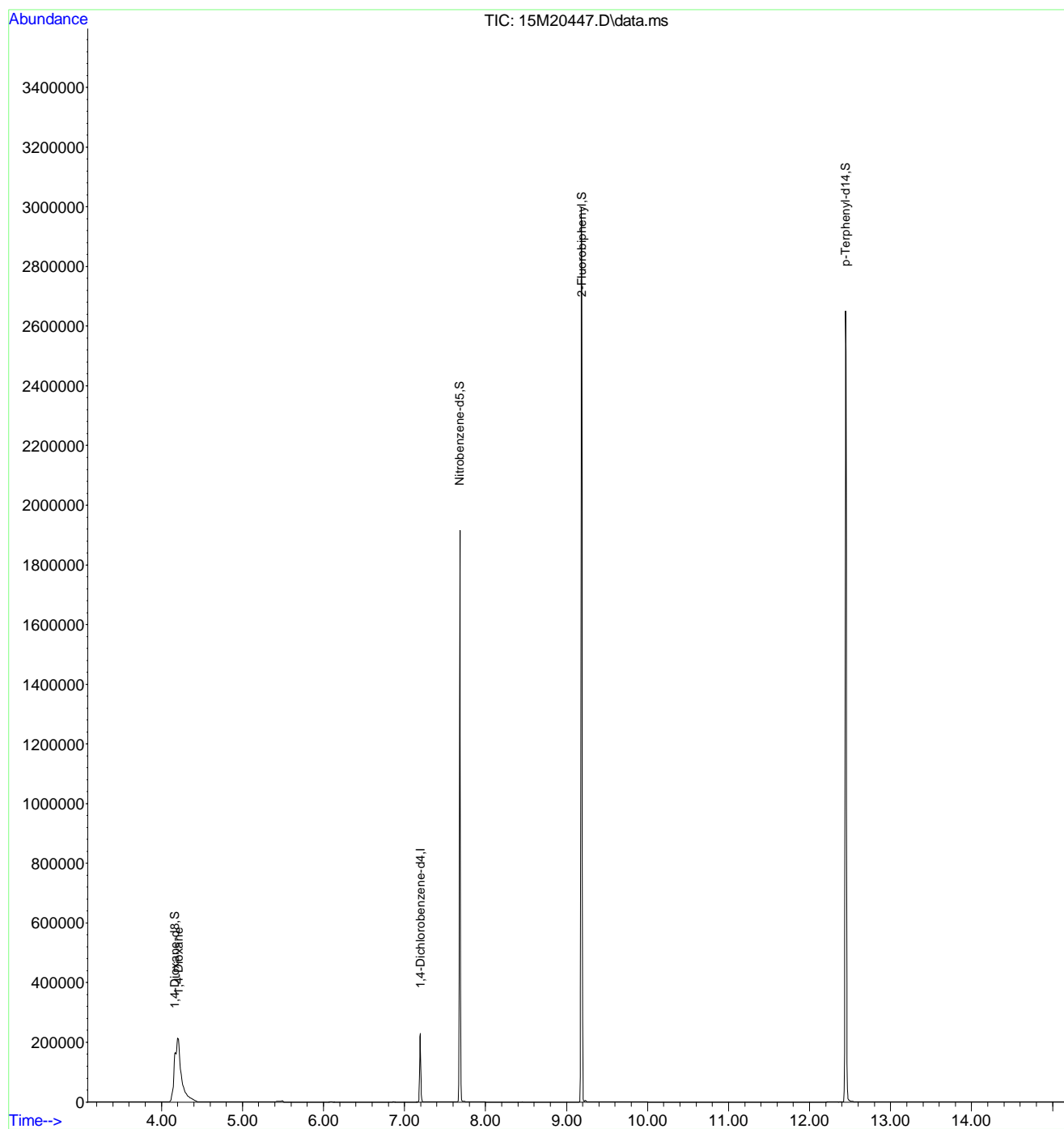
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.194	152	95143	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.165	96	332622	8.4173	ug/L	0.00
Spiked Amount	5.000		Recovery	=	168.40%	
4) Nitrobenzene-d5	7.684	82	885473	7.4556	ug/L	0.00
Spiked Amount	5.000		Recovery	=	149.20%	
5) 2-Fluorobiphenyl	9.188	172	2112386	9.4394	ug/L	0.00
Spiked Amount	5.000		Recovery	=	188.80%	
6) p-Terphenyl-d14	12.446	244	2365419	11.8160	ug/L	0.00
Spiked Amount	5.000		Recovery	=	236.40%	
Target Compounds						
2) 1,4-Dioxane	4.207	58	281569	9.7676	ug/L	# 1

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20447.D
Acq On : 25 Jan 2017 12:12 pm
Operator : LJH/MES
Sample : WG600070-03 10PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jan 25 14:10:36 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Jan 26 11:33:20 2017

Page: 2

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20448.D
 Acq On : 25 Jan 2017 12:35 pm
 Operator : LJH/MES
 Sample : WG600070-04 7.5PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jan 25 14:10:38 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

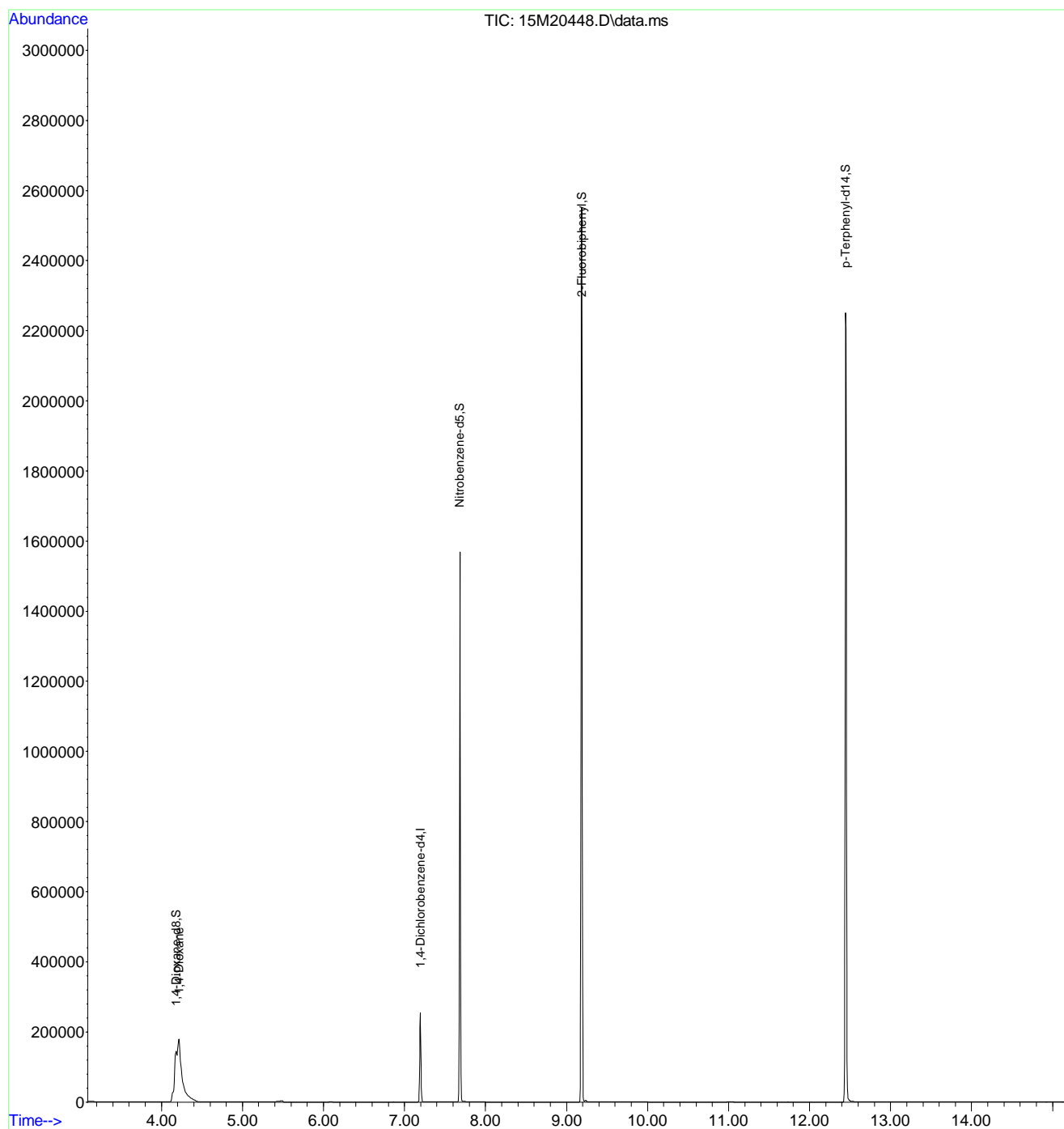
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.194	152	105221	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.179	96	273459	6.2573	ug/L	0.00
Spiked Amount	5.000		Recovery	=	125.20%	
4) Nitrobenzene-d5	7.683	82	725247	5.5217	ug/L	0.00
Spiked Amount	5.000		Recovery	=	110.40%	
5) 2-Fluorobiphenyl	9.188	172	1779961	7.1921	ug/L	0.00
Spiked Amount	5.000		Recovery	=	143.80%	
6) p-Terphenyl-d14	12.446	244	2014860	9.1009	ug/L	0.00
Spiked Amount	5.000		Recovery	=	182.00%	
Target Compounds						
2) 1,4-Dioxane	4.214	58	231497	7.2614	ug/L	# 1

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20448.D
Acq On : 25 Jan 2017 12:35 pm
Operator : LJH/MES
Sample : WG600070-04 7.5PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jan 25 14:10:38 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Jan 26 11:33:24 2017

Page: 2

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20449.D
 Acq On : 25 Jan 2017 12:58 pm
 Operator : LJH/MES
 Sample : WG600070-05 2.5PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 5 Sample Multiplier: 1

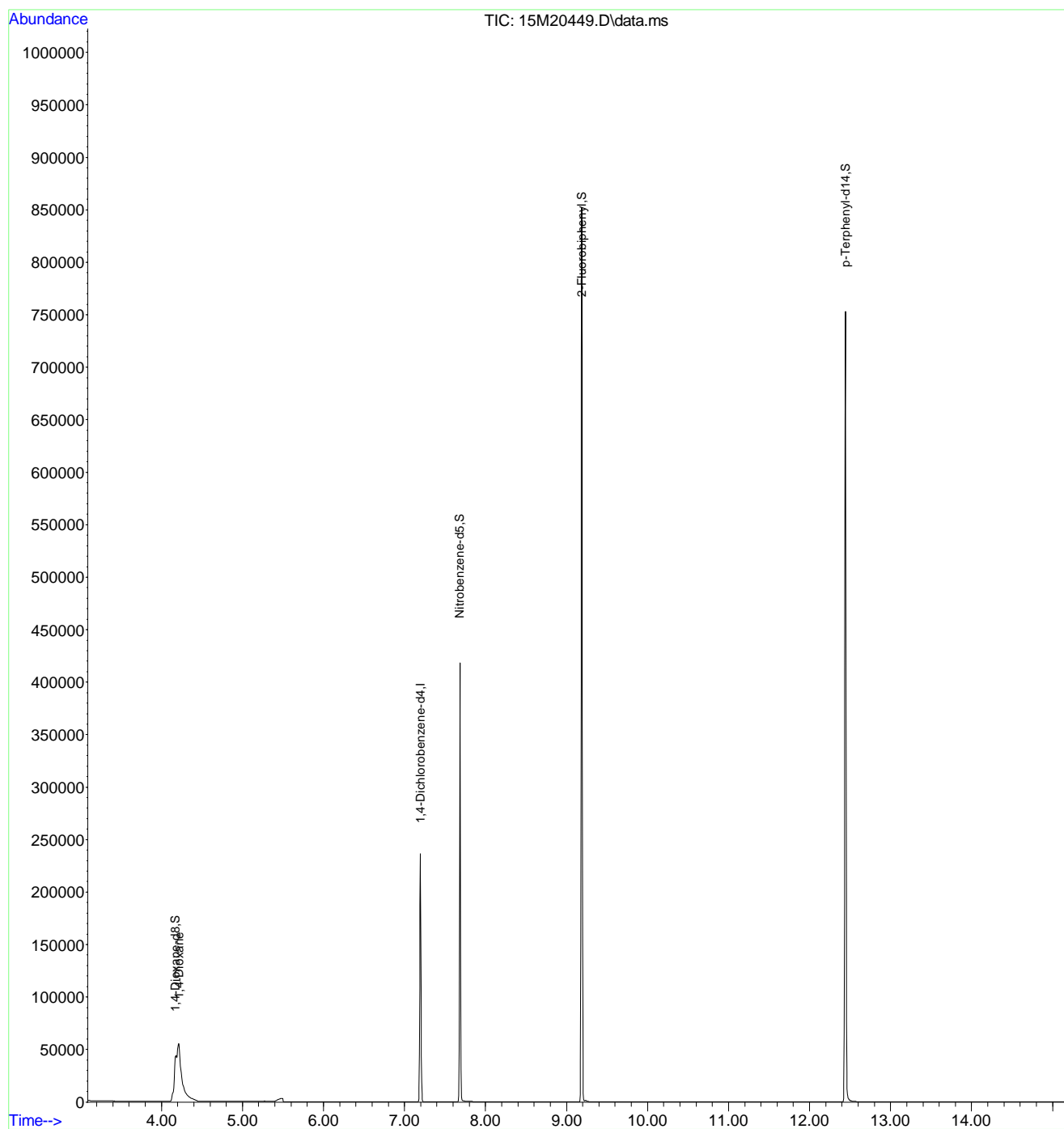
Quant Time: Jan 25 14:10:40 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	98361	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.172	96	84371	2.0652	ug/L	0.00
Spiked Amount	5.000		Recovery	=	41.40%	
4) Nitrobenzene-d5	7.683	82	201936	1.6447	ug/L	0.00
Spiked Amount	5.000		Recovery	=	32.80%	
5) 2-Fluorobiphenyl	9.188	172	575071	2.4857	ug/L	0.00
Spiked Amount	5.000		Recovery	=	49.80%	
6) p-Terphenyl-d14	12.442	244	648767	3.1348	ug/L	0.00
Spiked Amount	5.000		Recovery	=	62.60%	
Target Compounds						
2) 1,4-Dioxane	4.214	58	71344	2.3939	ug/L	# 1

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20449.D
Acq On : 25 Jan 2017 12:58 pm
Operator : LJH/MES
Sample : WG600070-05 2.5PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Jan 25 14:10:40 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20450.D
 Acq On : 25 Jan 2017 1:21 pm
 Operator : LJH/MES
 Sample : WG600070-06 1PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jan 25 14:10:42 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

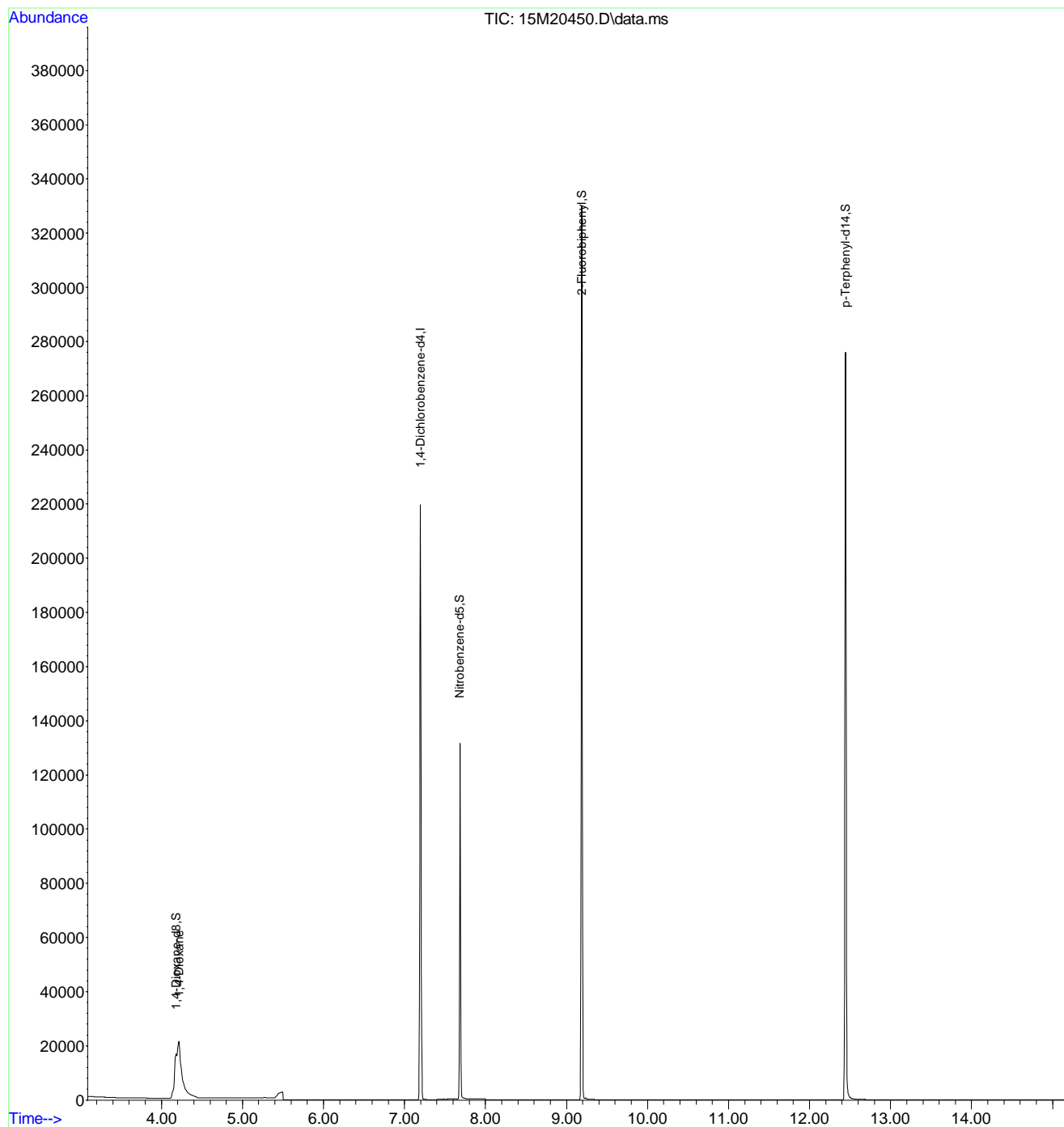
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	92979	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.179	96	32550	0.8429	ug/L	0.00
Spiked Amount	5.000		Recovery	=	16.80%	
4) Nitrobenzene-d5	7.684	82	68404	0.5894	ug/L	0.00
Spiked Amount	5.000		Recovery	=	11.80%	
5) 2-Fluorobiphenyl	9.188	172	220068	1.0063	ug/L	0.00
Spiked Amount	5.000		Recovery	=	20.20%	
6) p-Terphenyl-d14	12.442	244	242985	1.2420	ug/L	0.00
Spiked Amount	5.000		Recovery	=	24.80%	
Target Compounds						
2) 1,4-Dioxane	4.215	58	27390	0.9723	ug/L	Qvalue # 1

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20450.D
Acq On : 25 Jan 2017 1:21 pm
Operator : LJH/MES
Sample : WG600070-06 1PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jan 25 14:10:42 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20451.D
 Acq On : 25 Jan 2017 1:43 pm
 Operator : LJH/MES
 Sample : WG600070-07 0.4PPM 1,4-DIOXANE STD
 Misc : 1,1 STD80097
 ALS Vial : 7 Sample Multiplier: 1

Quant Time: Jan 25 14:10:44 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:09:26 2017
 Response via : Initial Calibration

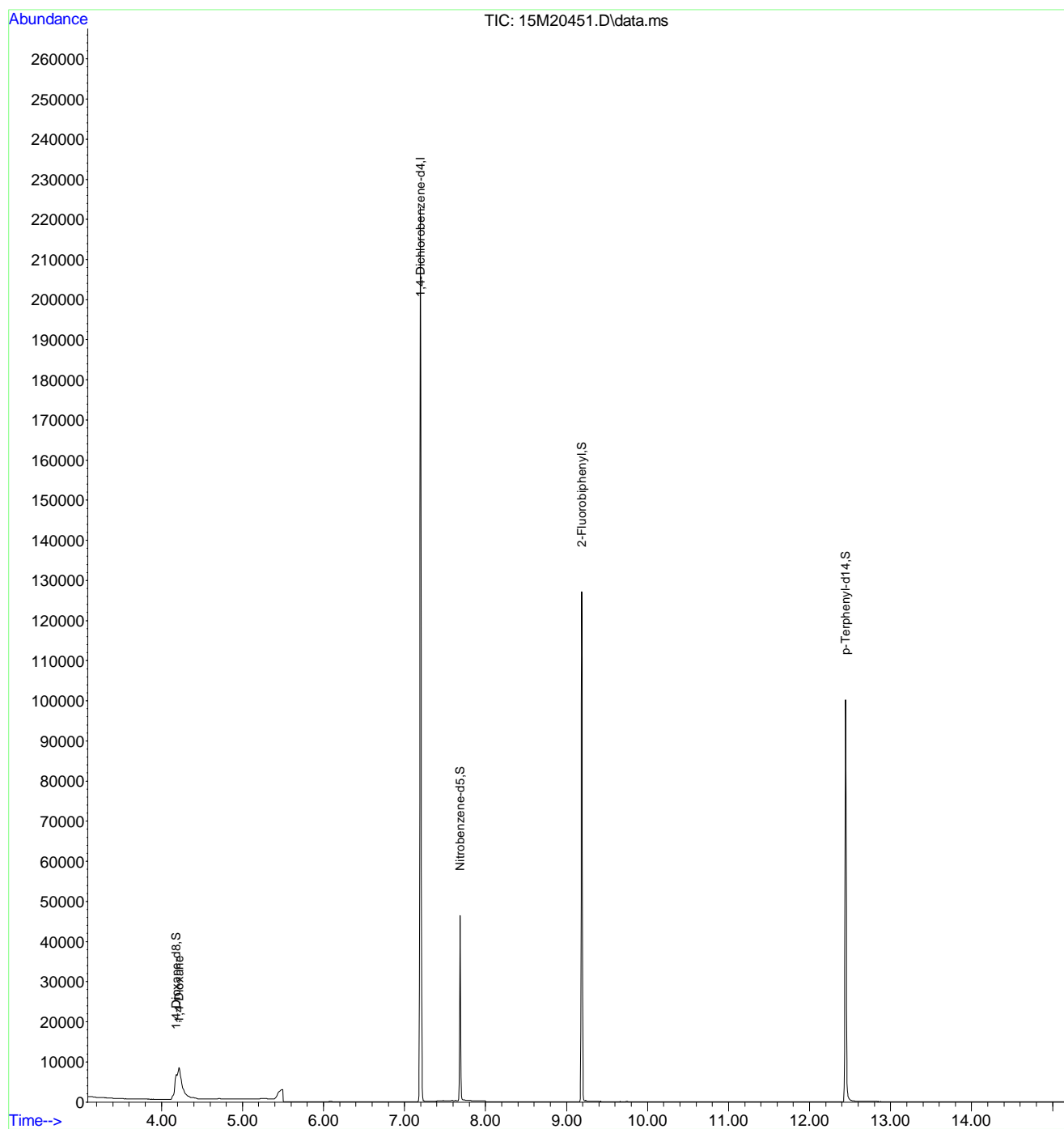
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	93615	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.179	96	12791	0.3290	ug/L	0.00
Spiked Amount	5.000		Recovery	=	6.60%	
4) Nitrobenzene-d5	7.689	82	24123	0.2064	ug/L	0.00
Spiked Amount	5.000		Recovery	=	4.20%	
5) 2-Fluorobiphenyl	9.188	172	85077	0.3864	ug/L	0.00
Spiked Amount	5.000		Recovery	=	7.80%	
6) p-Terphenyl-d14	12.446	244	90972	0.4619	ug/L	0.00
Spiked Amount	5.000		Recovery	=	9.20%	
Target Compounds						
2) 1,4-Dioxane	4.215	58	10787	0.3803	ug/L	Qvalue 99

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20451.D
Acq On : 25 Jan 2017 1:43 pm
Operator : LJH/MES
Sample : WG600070-07 0.4PPM 1,4-DIOXANE STD
Misc : 1,1 STD80097
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Jan 25 14:10:44 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:09:26 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Jan 26 11:33:33 2017

Page: 2

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20452.D
 Acq On : 25 Jan 2017 2:18 pm
 Operator : LJH/MES
 Sample : WG600070-08 5PPM 1,4-DIOXANE ALT STD
 Misc : 1,1 STD80098
 ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jan 25 14:47:39 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:13:58 2017
 Response via : Initial Calibration

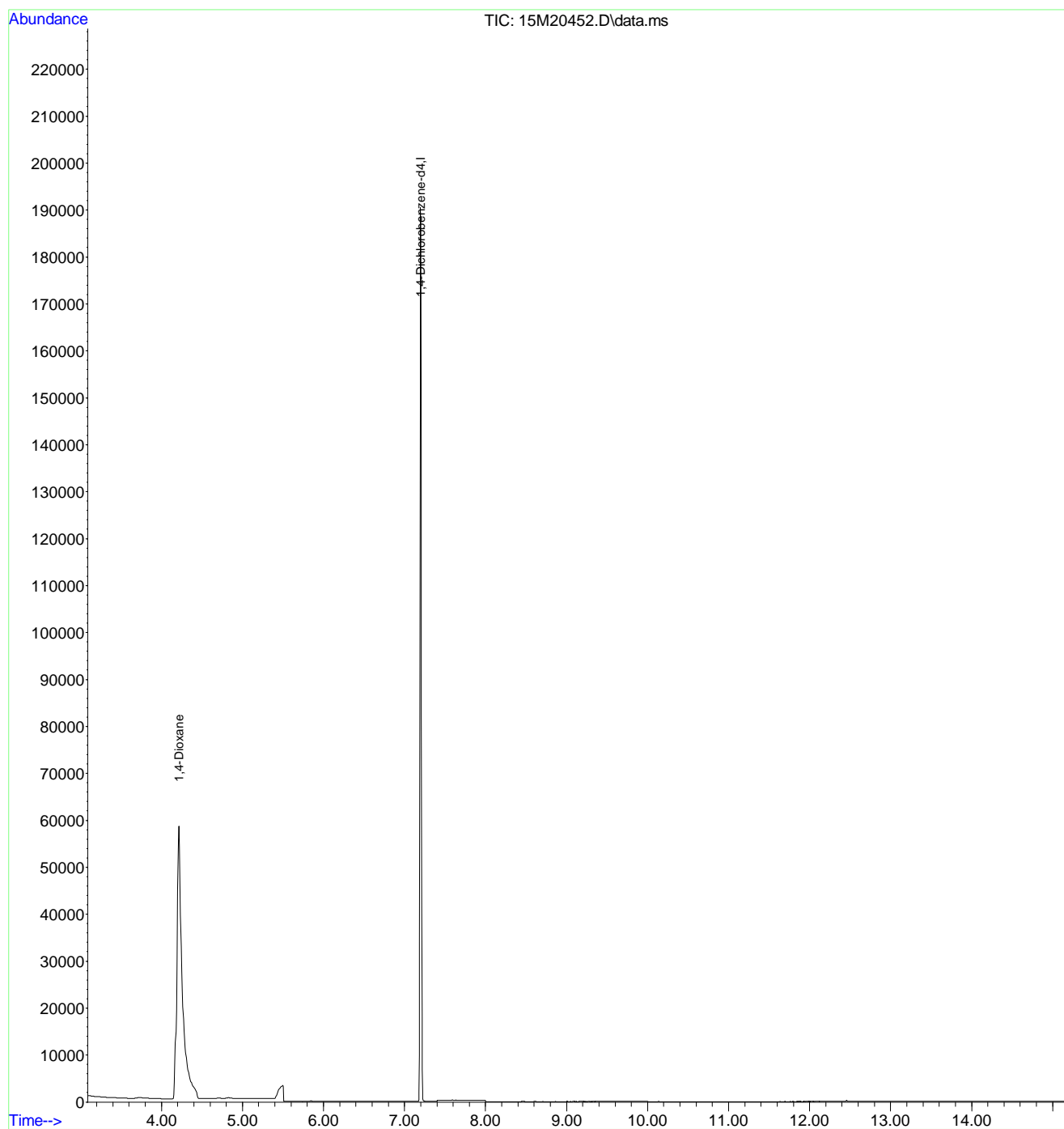
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.201	152	81662	1.0000	ug/mL	# 0.00
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.214	96	23	0.0008	ug/L	0.04
Spiked Amount	5.000		Recovery	=	0.00%	
4) Nitrobenzene-d5	7.420	82	294	0.0044	ug/L	-0.26
Spiked Amount	5.000		Recovery	=	0.00%	
5) 2-Fluorobiphenyl	9.191	172	45	0.0002	ug/L	0.00
Spiked Amount	5.000		Recovery	=	0.00%	
6) p-Terphenyl-d14	12.456	244	227	0.0011	ug/L	0.00
Spiked Amount	5.000		Recovery	=	0.00%	
Target Compounds						
2) 1,4-Dioxane	4.214	58	110033	4.6085	ug/L	Qvalue # 100

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

Data Path : C:\msdchem\1\data\012517\
Data File : 15M20452.D
Acq On : 25 Jan 2017 2:18 pm
Operator : LJH/MES
Sample : WG600070-08 5PPM 1,4-DIOXANE ALT STD
Misc : 1,1 STD80098
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jan 25 14:47:39 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Wed Jan 25 14:13:58 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Jan 26 11:35:30 2017

Page: 2

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20452.D
 Acq On : 25 Jan 2017 2:18 pm
 Operator : LJH/MES
 Sample : WG600070-08 5PPM 1,4-DIOXANE ALT STD
 Misc : 1,1 STD80098
 ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jan 25 14:47:39 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:13:58 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	81	0.00
2	1,4-Dioxane	0.292	0.269	7.9	74	0.00
3 S	1,4-Dioxane-d8	0.347	0.000	100.0#	0#	0.04
4 S	Nitrobenzene-d5	0.825	0.001	99.9#	0#	-0.26
5 S	2-Fluorobiphenyl	2.293	0.000	100.0#	0#	0.00
6 S	p-Terphenyl-d14	2.558	0.001	100.0#	0#	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20452.D
 Acq On : 25 Jan 2017 2:18 pm
 Operator : LJH/MES
 Sample : WG600070-08 5PPM 1,4-DIOXANE ALT STD
 Misc : 1,1 STD80098
 ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jan 25 14:47:39 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Wed Jan 25 14:13:58 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	81	0.00
2	1,4-Dioxane	5.000	4.609	7.8	74	0.00
3 S	1,4-Dioxane-d8	5.000	0.001	100.0#	0	0.04
4 S	Nitrobenzene-d5	5.000	0.004	99.9#	0	-0.26
5 S	2-Fluorobiphenyl	5.000	0.000	100.0#	0	0.00
6 S	p-Terphenyl-d14	5.000	0.001	100.0#	0	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20596.D
 Acq On : 1 Mar 2017 1:50 pm
 Operator : SCB/LJH
 Sample : WG604649-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

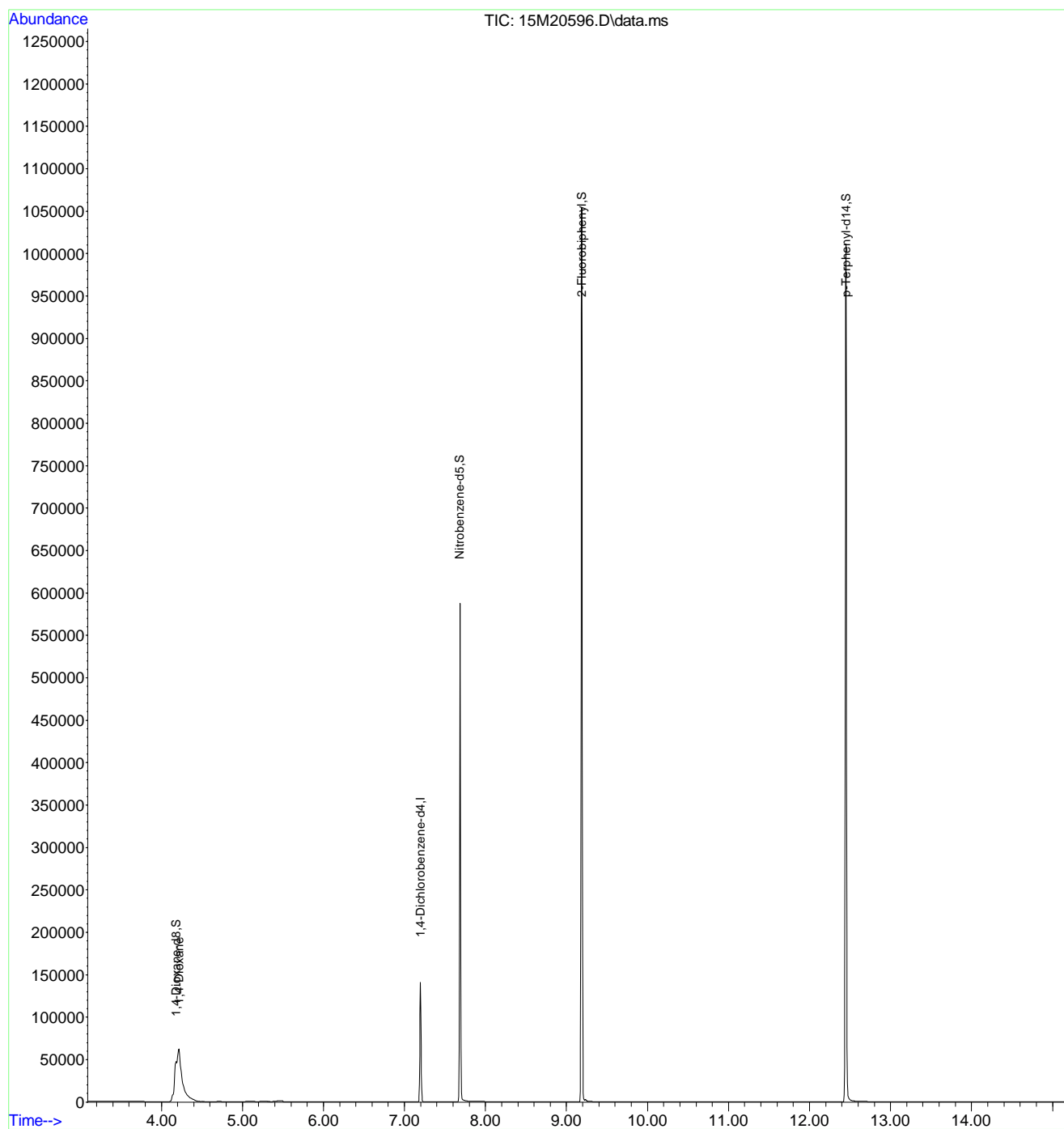
Quant Time: Mar 01 14:06:34 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	60518	1.0000	ug/mL	# 0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.179	96	99046	4.7192	ug/L	0.03
Spiked Amount	5.000		Recovery	=	94.40%	
4) Nitrobenzene-d5	7.684	82	305907	6.1295	ug/L	0.02
Spiked Amount	5.000		Recovery	=	122.60%	
5) 2-Fluorobiphenyl	9.188	172	728832	5.2513	ug/L	0.02
Spiked Amount	5.000		Recovery	=	105.00%	
6) p-Terphenyl-d14	12.450	244	889308	5.7446	ug/L	0.03
Spiked Amount	5.000		Recovery	=	114.80%	
Target Compounds						
2) 1,4-Dioxane	4.215	58	80372	4.5424	ug/L	# 1

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

Data Path : C:\msdchem\1\data\030117\
Data File : 15M20596.D
Acq On : 1 Mar 2017 1:50 pm
Operator : SCB/LJH
Sample : WG604649-02 5PPM DIOX STD
Misc : 1,1 STD80097
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 01 14:06:34 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Mar 02 15:22:16 2017

Page: 2

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20596.D
 Acq On : 1 Mar 2017 1:50 pm
 Operator : SCB/LJH
 Sample : WG604649-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 01 14:06:34 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	60	0.02
2	1,4-Dioxane	0.292	0.266	8.9	54	0.03
3 S	1,4-Dioxane-d8	0.347	0.327	5.8	57	0.03
4 S	Nitrobenzene-d5	0.825	1.011	-22.5	67	0.02
5 S	2-Fluorobiphenyl	2.293	2.409	-5.1	62	0.02
6 S	p-Terphenyl-d14	2.558	2.939	-14.9	67	0.03

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20596.D
 Acq On : 1 Mar 2017 1:50 pm
 Operator : SCB/LJH
 Sample : WG604649-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 01 14:06:34 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	60	0.02
2	1,4-Dioxane	5.000	4.542	9.2	54	0.03
3 S	1,4-Dioxane-d8	5.000	4.719	5.6	57	0.03
4 S	Nitrobenzene-d5	5.000	6.129	-22.6	67	0.02
5 S	2-Fluorobiphenyl	5.000	5.251	-5.0	62	0.02
6 S	p-Terphenyl-d14	5.000	5.745	-14.9	67	0.03

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20620.D
 Acq On : 2 Mar 2017 11:29 am
 Operator : SCB/LJH
 Sample : WG604728-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 02 11:45:15 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

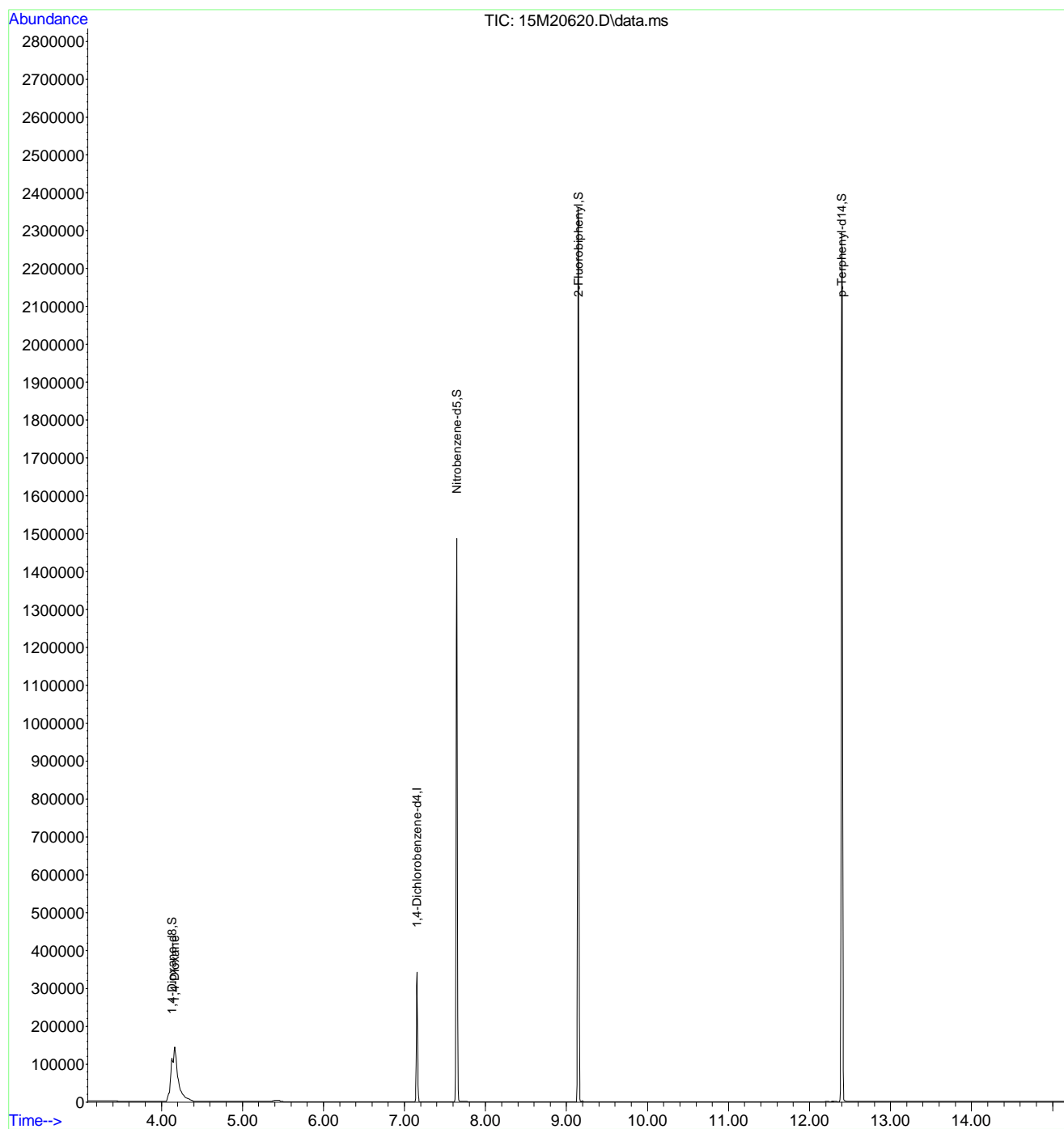
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.154	152	141709	1.0000	ug/mL	#-0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.130	96	225325	4.5849	ug/L	-0.02
Spiked Amount	5.000		Recovery	=	91.60%	
4) Nitrobenzene-d5	7.646	82	702400	6.0104	ug/L	-0.02
Spiked Amount	5.000		Recovery	=	120.20%	
5) 2-Fluorobiphenyl	9.147	172	1637964	5.0400	ug/L	-0.02
Spiked Amount	5.000		Recovery	=	100.80%	
6) p-Terphenyl-d14	12.398	244	1967879	5.4287	ug/L	-0.02
Spiked Amount	5.000		Recovery	=	108.60%	
Target Compounds						
2) 1,4-Dioxane	4.165	58	183728	4.4344	ug/L	Qvalue 94

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

Data Path : C:\msdchem\1\data\030217\
Data File : 15M20620.D
Acq On : 2 Mar 2017 11:29 am
Operator : SCB/LJH
Sample : WG604728-02 5PPM DIOX STD
Misc : 1,1 STD80097
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 02 11:45:15 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration



DIOXANE_D8.M Fri Mar 03 09:17:55 2017

Page: 2

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20620.D
 Acq On : 2 Mar 2017 11:29 am
 Operator : SCB/LJH
 Sample : WG604728-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 02 11:45:15 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	140	-0.02
2	1,4-Dioxane	0.292	0.259	11.3	124	-0.02
3 S	1,4-Dioxane-d8	0.347	0.318	8.4	129	-0.02
4 S	Nitrobenzene-d5	0.825	0.991	-20.1	154#	-0.02
5 S	2-Fluorobiphenyl	2.293	2.312	-0.8	140	-0.02
6 S	p-Terphenyl-d14	2.558	2.777	-8.6	148	-0.02

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20620.D
 Acq On : 2 Mar 2017 11:29 am
 Operator : SCB/LJH
 Sample : WG604728-02 5PPM DIOX STD
 Misc : 1,1 STD80097
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 02 11:45:15 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
 Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(min)
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	140	-0.02
2	1,4-Dioxane	5.000	4.434	11.3	124	-0.02
3 S	1,4-Dioxane-d8	5.000	4.585	8.3	129	-0.02
4 S	Nitrobenzene-d5	5.000	6.010	-20.2	154	-0.02
5 S	2-Fluorobiphenyl	5.000	5.040	-0.8	140	-0.02
6 S	p-Terphenyl-d14	5.000	5.429	-8.6	148	-0.02

(#) = Out of Range

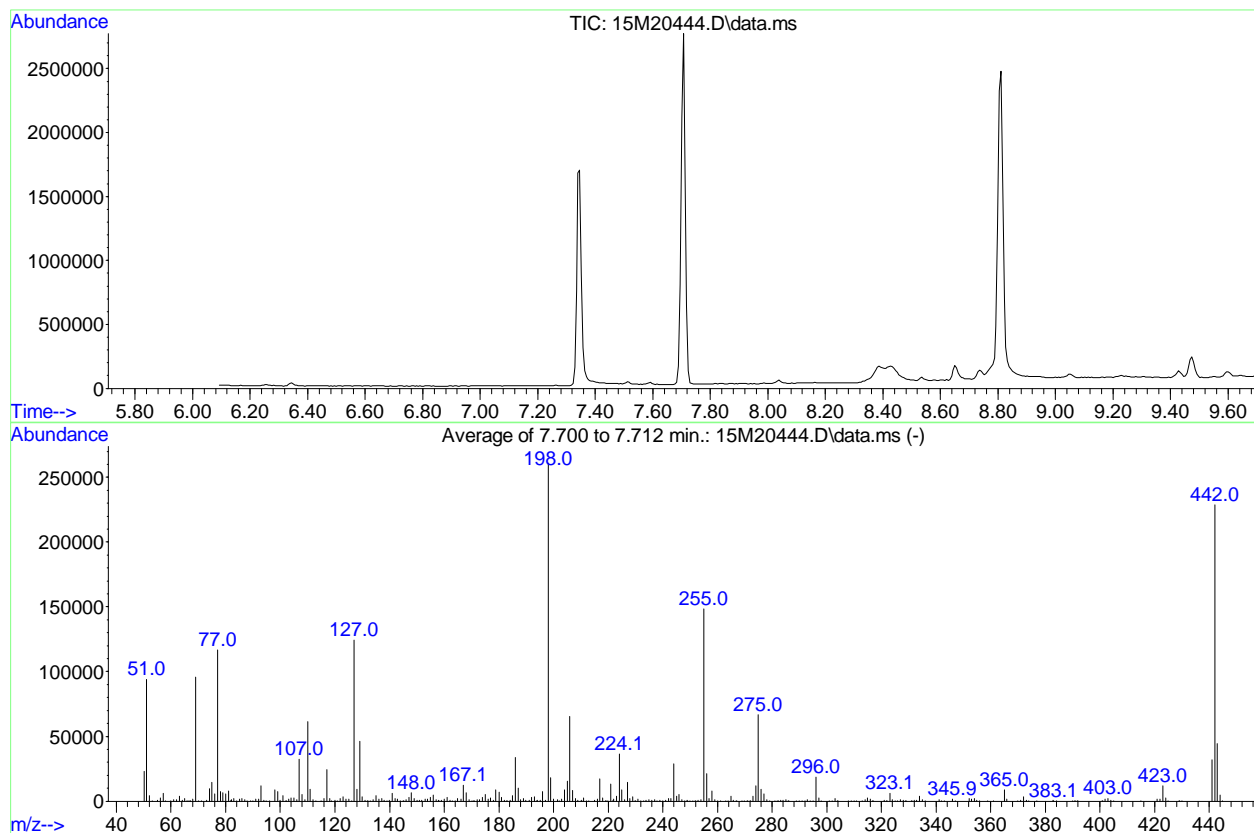
SPCC's out = 0 CCC's out = 0

2.2.1.5 Raw QC Data

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20444.D
 Acq On : 25 Jan 2017 10:55 am
 Operator : LJH/MES
 Sample : WG600070-01 5PPM LL DFTPP
 Misc : 1,1 STD77832
 ALS Vial : 1 Sample Multiplier: 1

Integration File: RTEINT.P

Method : C:\msdchem\1\methods\DFTPP.M
 Title : DFTPP
 Last Update : Wed Jan 25 11:15:41 2017

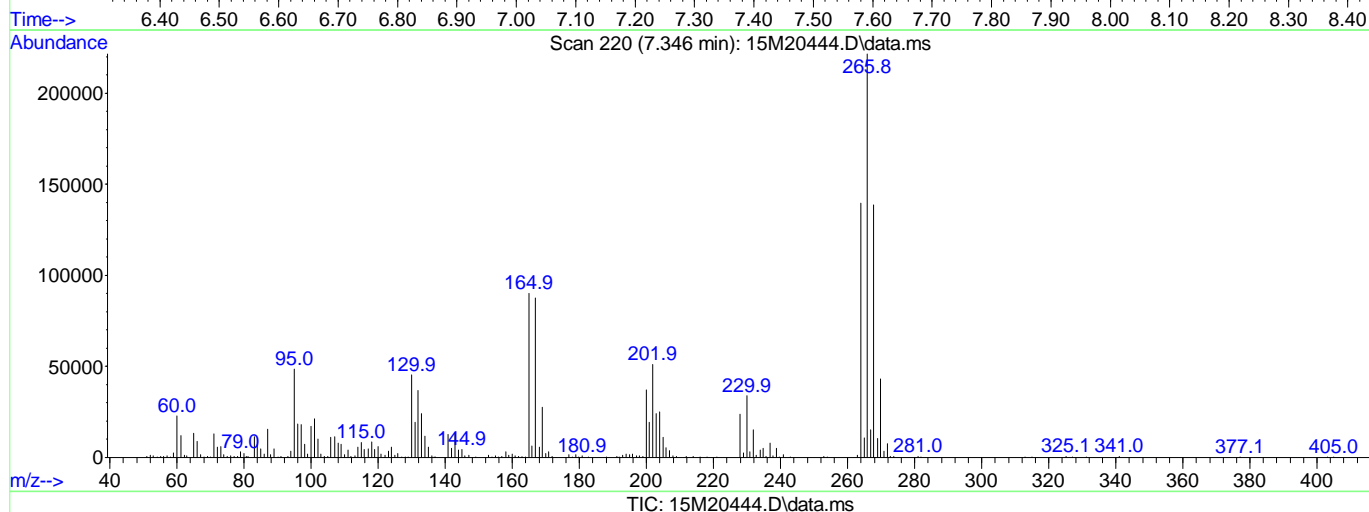
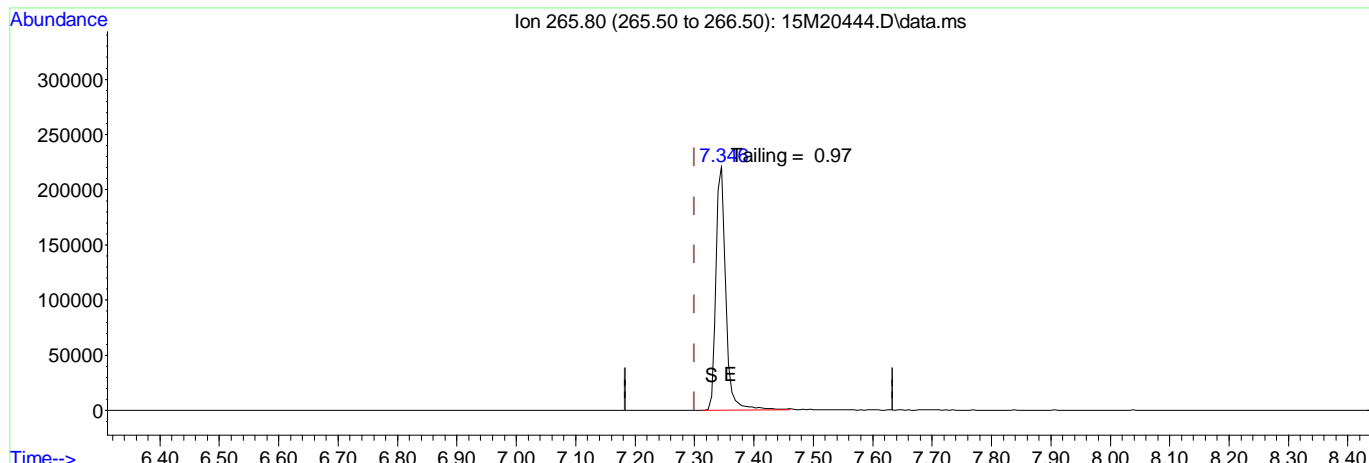


AutoFind: Scans 282, 283, 284; Background Corrected with Scan 273

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	36.0	93844	PASS
68	69	0.00	2	1.8	1752	PASS
69	198	0.00	100	36.7	95703	PASS
70	69	0.00	2	0.3	290	PASS
127	198	40	60	47.7	124552	PASS
197	198	0.00	1	0.3	783	PASS
198	198	100	100	100.0	261013	PASS
199	198	5	9	6.9	17926	PASS
275	198	10	30	25.5	66533	PASS
365	198	1	100	3.3	8631	PASS
441	443	0.01	100	71.8	32016	PASS
442	198	40	100	87.6	228651	PASS
443	442	17	23	19.5	44595	PASS

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20444.D
 Acq On : 25 Jan 2017 10:55 am
 Operator : LJH/MES
 Sample : WG600070-01 5PPM LL DFTPP
 Misc : 1,1 STD77832
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jan 25 11:15:49 2017
 Quant Method : C:\msdchem\1\methods\DFTPP.M
 Quant Title : DFTPP
 QLast Update : Wed Jan 25 11:15:41 2017
 Response via : Initial Calibration



(1) Pentachlorophenol

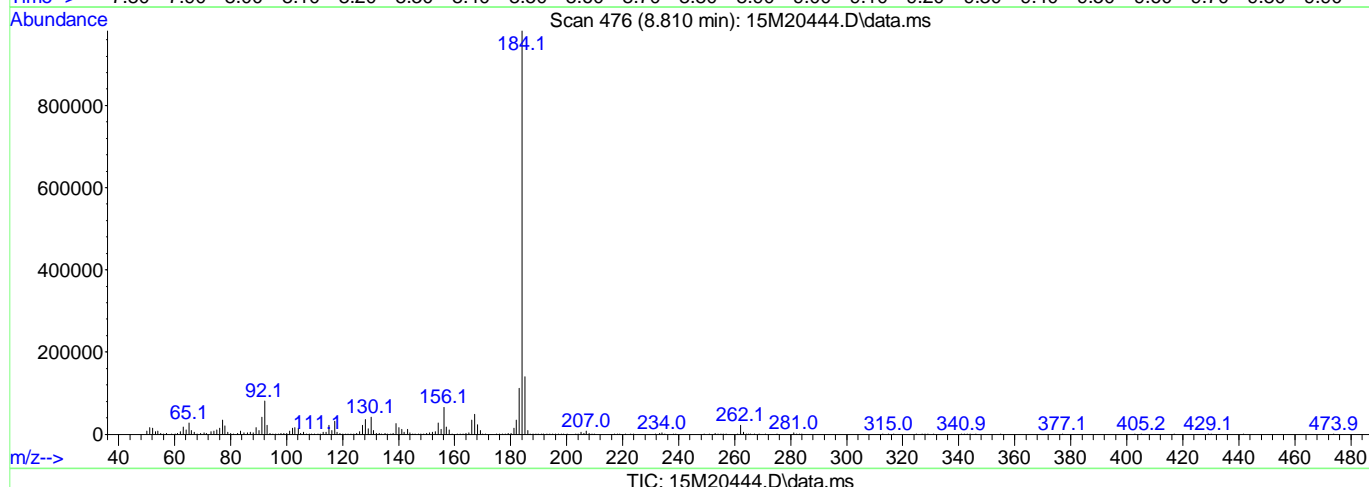
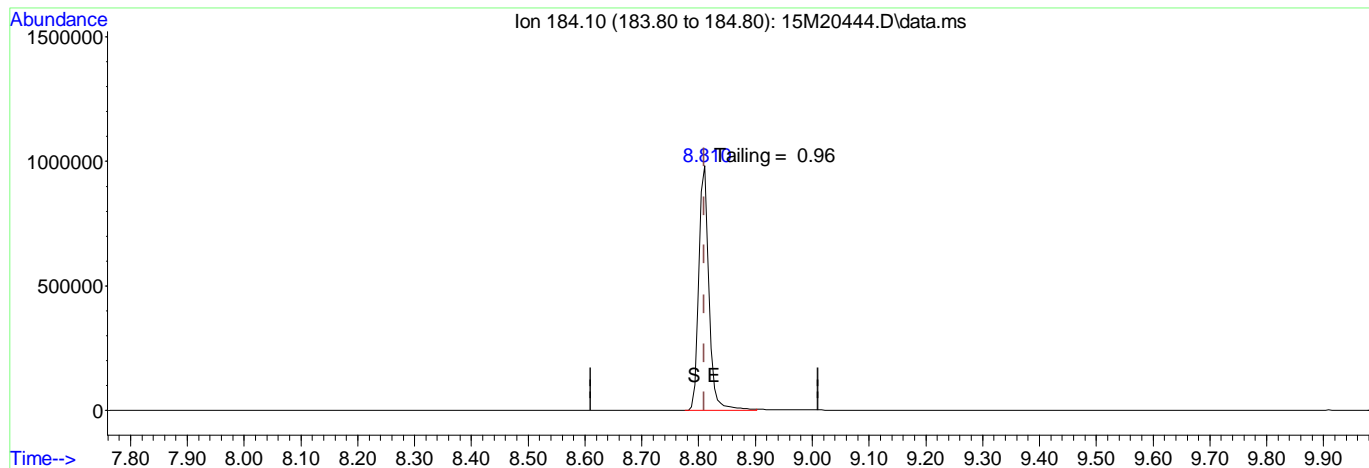
7.346min (+ 0.046) 0.00 ug/ml

response 254776

Ion	Exp%	Act%
265.80	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20444.D
 Acq On : 25 Jan 2017 10:55 am
 Operator : LJH/MES
 Sample : WG600070-01 5PPM LL DFTPP
 Misc : 1,1 STD77832
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jan 25 11:15:49 2017
 Quant Method : C:\msdchem\1\methods\DFTPP.M
 Quant Title : DFTPP
 QLast Update : Wed Jan 25 11:15:41 2017
 Response via : Initial Calibration



TIC: 15M20444.D\data.ms

(2) Benzidine

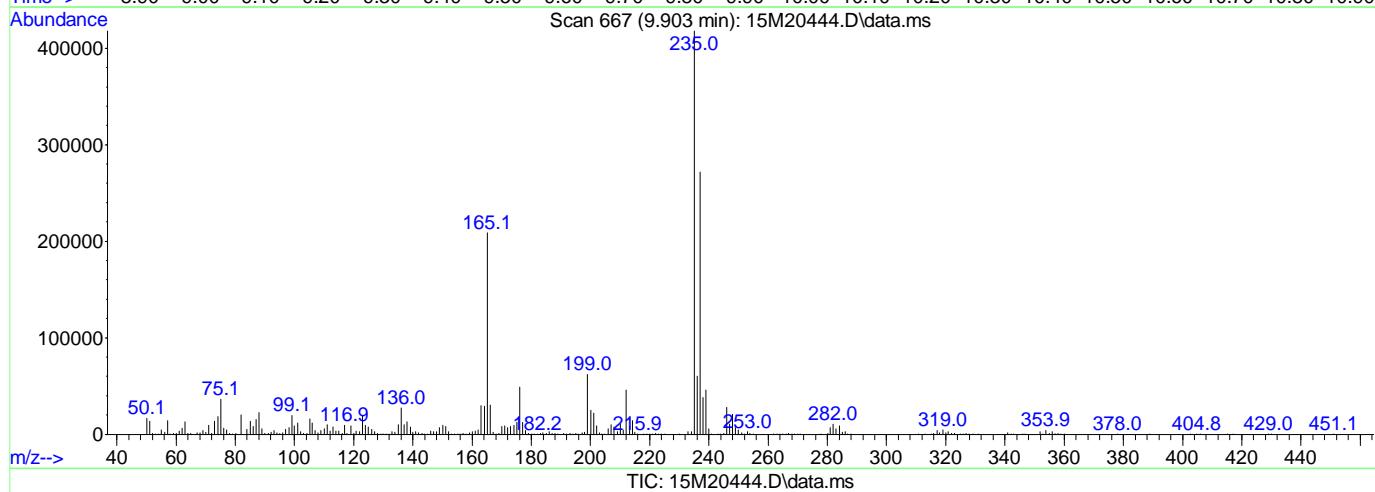
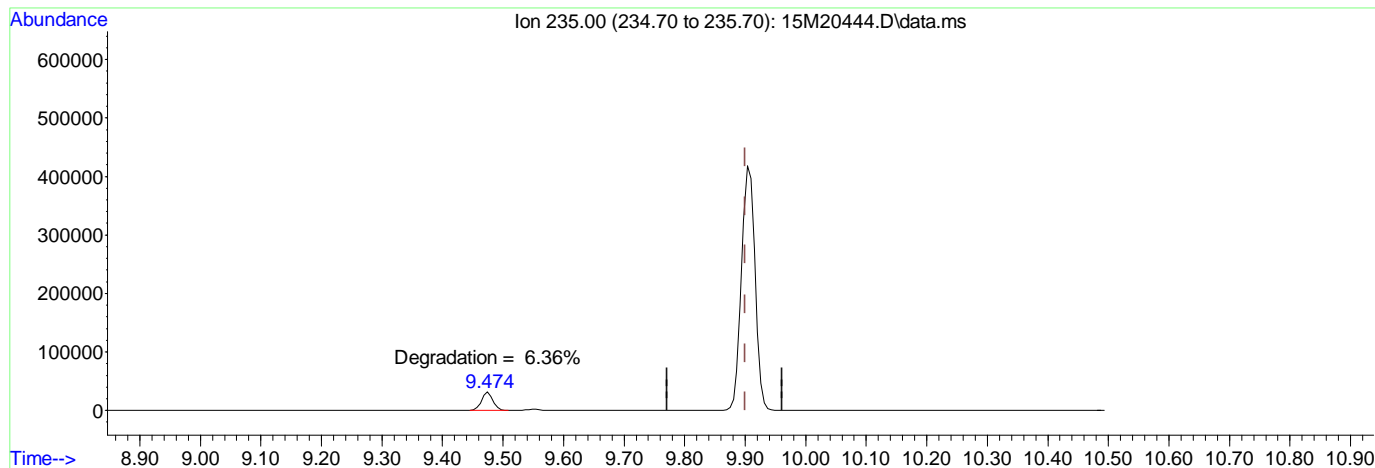
8.810min (+ 0.000) 0.00 ug/ml

response 1234427

Ion	Exp%	Act%
184.10	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\012517\
 Data File : 15M20444.D
 Acq On : 25 Jan 2017 10:55 am
 Operator : LJH/MES
 Sample : WG600070-01 5PPM LL DFTPP
 Misc : 1,1 STD77832
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jan 25 11:15:49 2017
 Quant Method : C:\msdchem\1\methods\DFTPP.M
 Quant Title : DFTPP
 QLast Update : Wed Jan 25 11:15:41 2017
 Response via : Initial Calibration



(3) DDT

9.903min (+ 0.003) 0.00 ug/ml

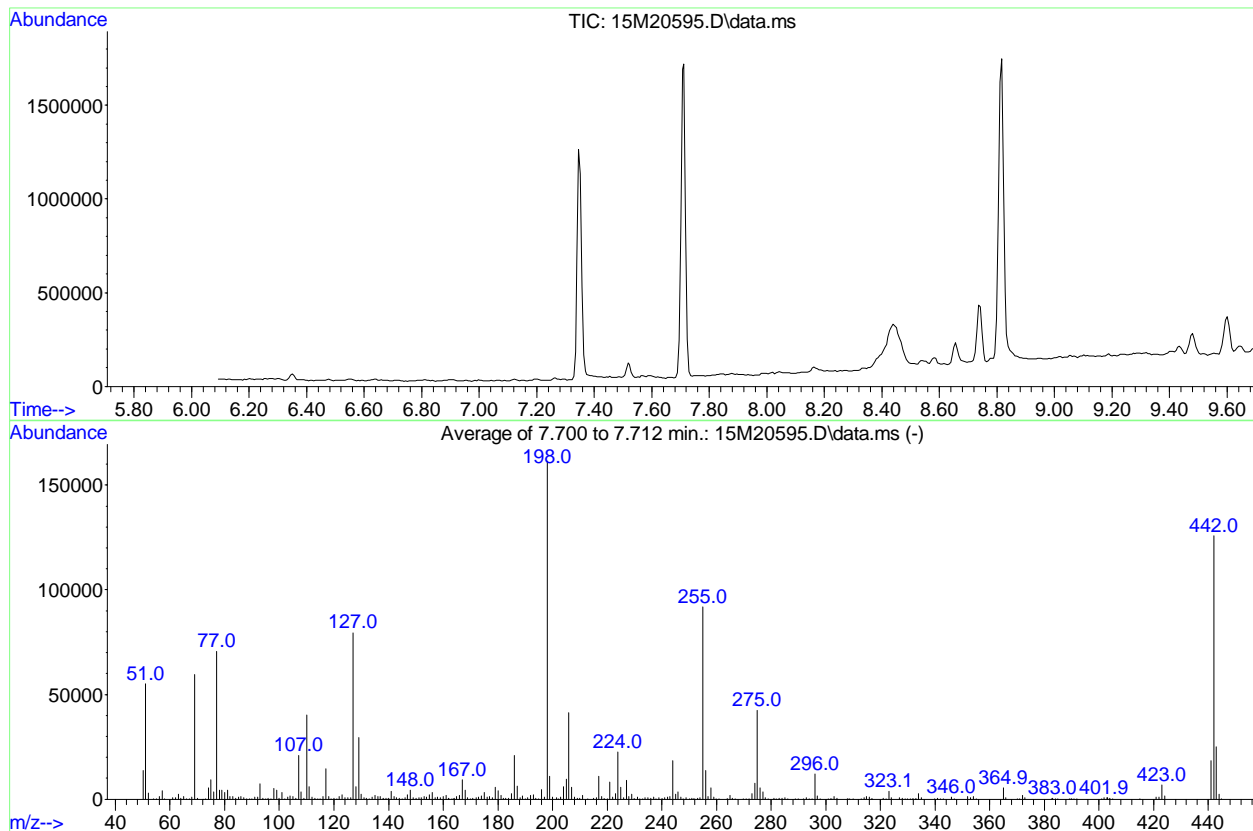
response 646290

Ion	Exp%	Act%
235.00	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20595.D
 Acq On : 1 Mar 2017 1:32 pm
 Operator : SCB/LJH
 Sample : WG604649-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\msdchem\1\methods\DFTPPQ.M
 Title : DFTPP
 Last Update : Tue Sep 13 14:03:54 2016

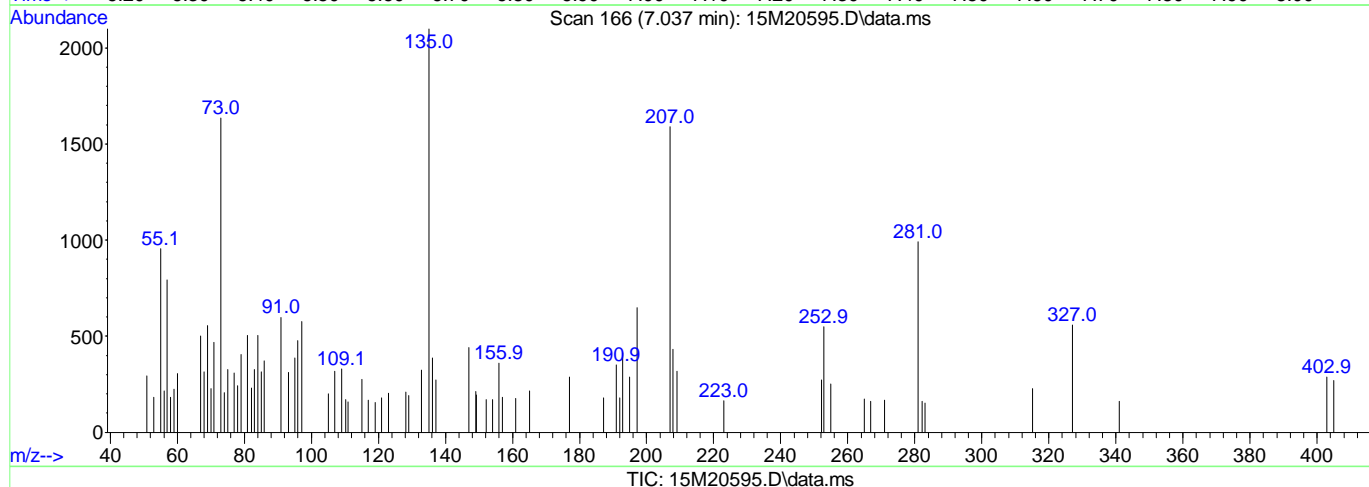
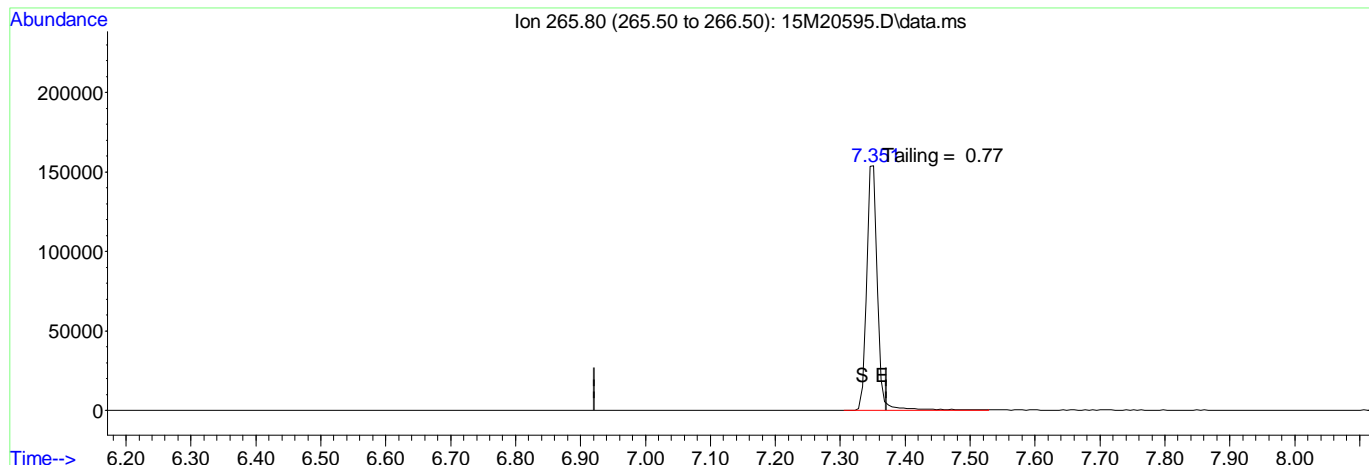


AutoFind: Scans 282, 283, 284; Background Corrected with Scan 277

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	34.2	55192	PASS
68	69	0.00	2	1.7	982	PASS
69	198	0.00	100	36.8	59512	PASS
70	69	0.00	2	0.9	508	PASS
127	198	40	60	49.3	79552	PASS
197	198	0.00	1	0.7	1118	PASS
198	198	100	100	100.0	161515	PASS
199	198	5	9	6.8	11052	PASS
275	198	10	30	26.3	42459	PASS
365	198	1	100	3.3	5399	PASS
441	443	0.01	100	74.1	18491	PASS
442	198	40	100	77.9	125893	PASS
443	442	17	23	19.8	24940	PASS

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20595.D
 Acq On : 1 Mar 2017 1:32 pm
 Operator : SCB/LJH
 Sample : WG604649-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 01 13:43:38 2017
 Quant Method : C:\msdchem\1\methods\DFTPPQ.M
 Quant Title : DFTPP
 QLast Update : Tue Sep 13 14:03:54 2016
 Response via : Initial Calibration



(1) Pentachlorophenol

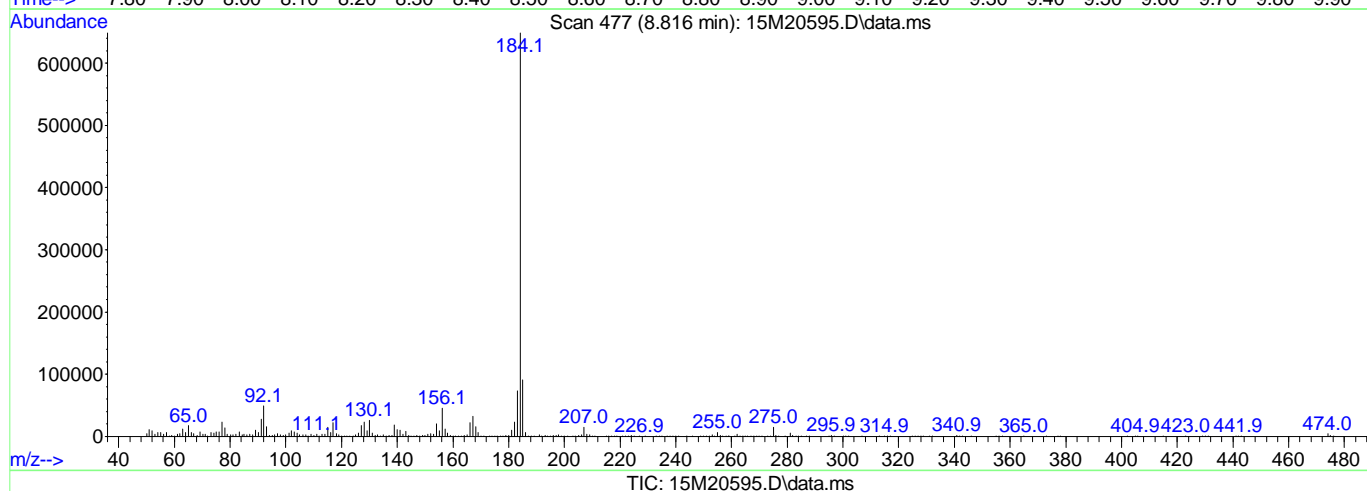
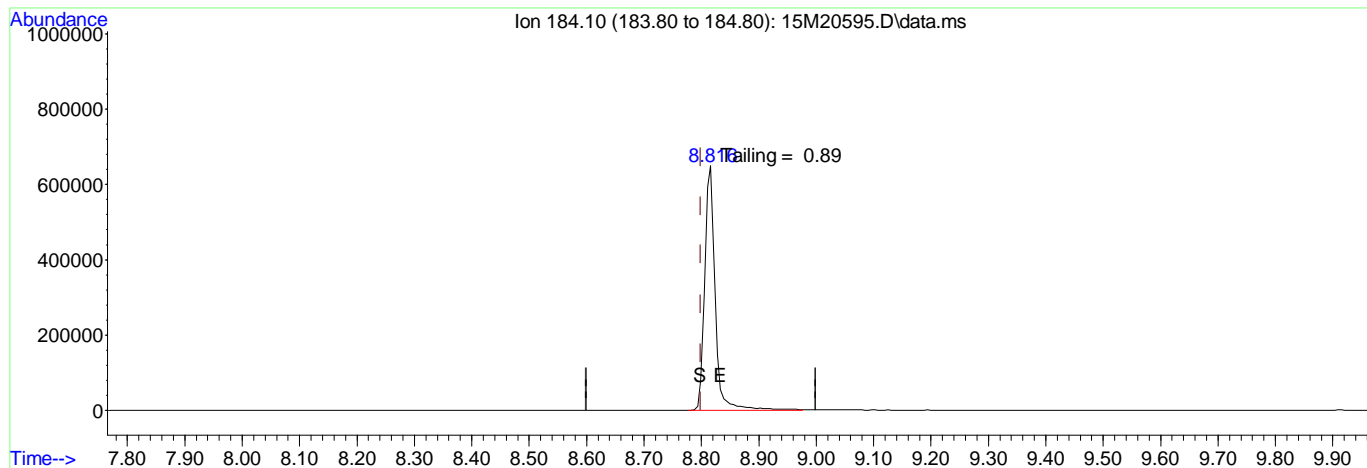
7.037min (-7.037) 0.00 ug/ml

response 0

Ion	Exp%	Act%
265.80	100.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20595.D
 Acq On : 1 Mar 2017 1:32 pm
 Operator : SCB/LJH
 Sample : WG604649-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 01 13:43:38 2017
 Quant Method : C:\msdchem\1\methods\DFTPPQ.M
 Quant Title : DFTPP
 QLast Update : Tue Sep 13 14:03:54 2016
 Response via : Initial Calibration



(2) Benzidine

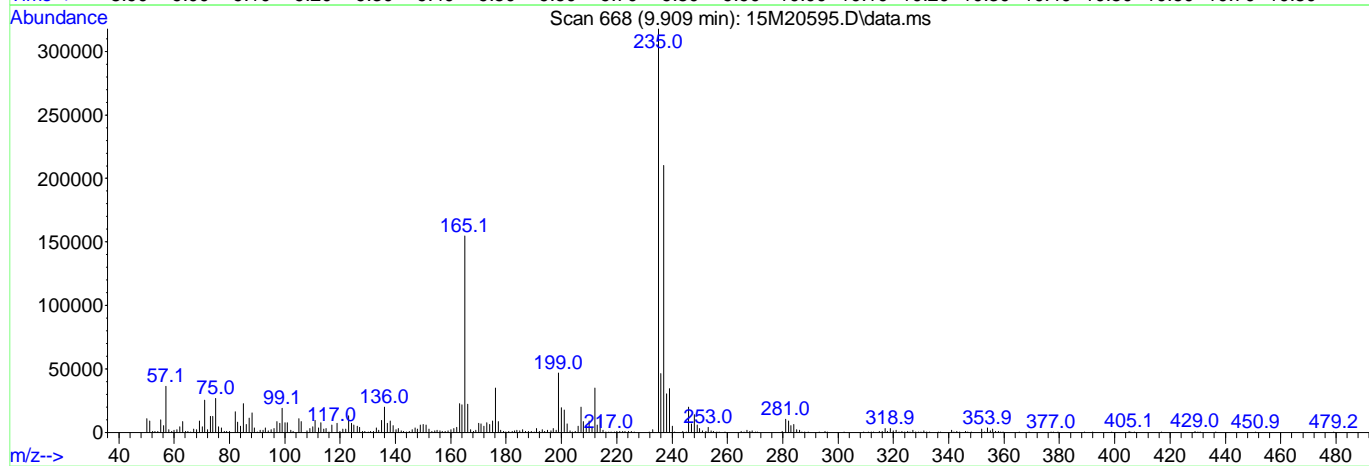
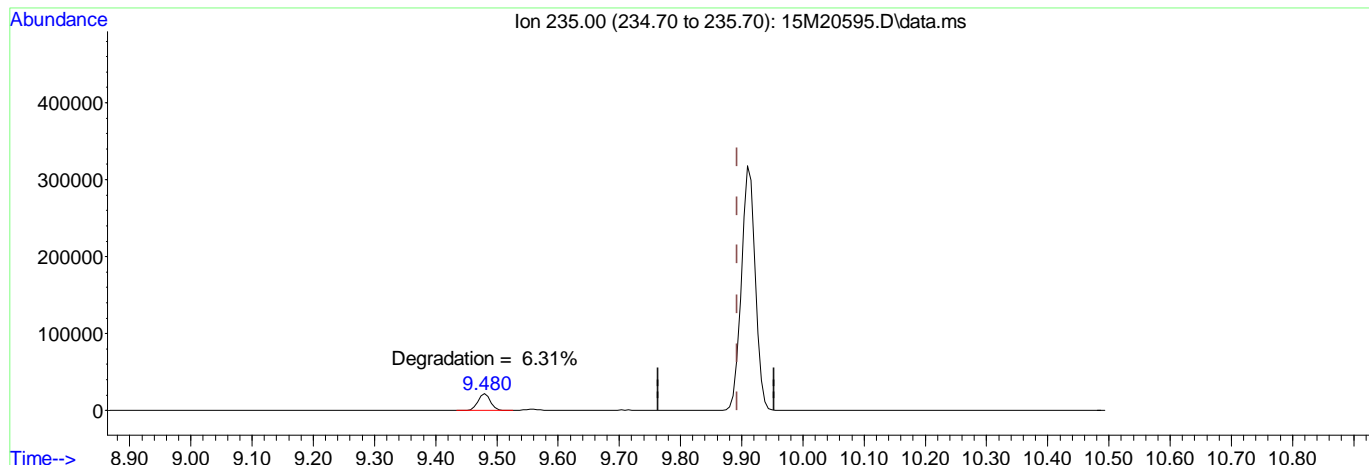
8.816min (+ 0.017) 0.00 ug/ml

response 834151

Ion	Exp%	Act%
184.10	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20595.D
 Acq On : 1 Mar 2017 1:32 pm
 Operator : SCB/LJH
 Sample : WG604649-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 01 13:43:38 2017
 Quant Method : C:\msdchem\1\methods\DFTPPQ.M
 Quant Title : DFTPP
 QLast Update : Tue Sep 13 14:03:54 2016
 Response via : Initial Calibration



TIC: 15M20595.D\data.ms

(3) DDT

9.909min (+ 0.017) 0.00 ug/ml

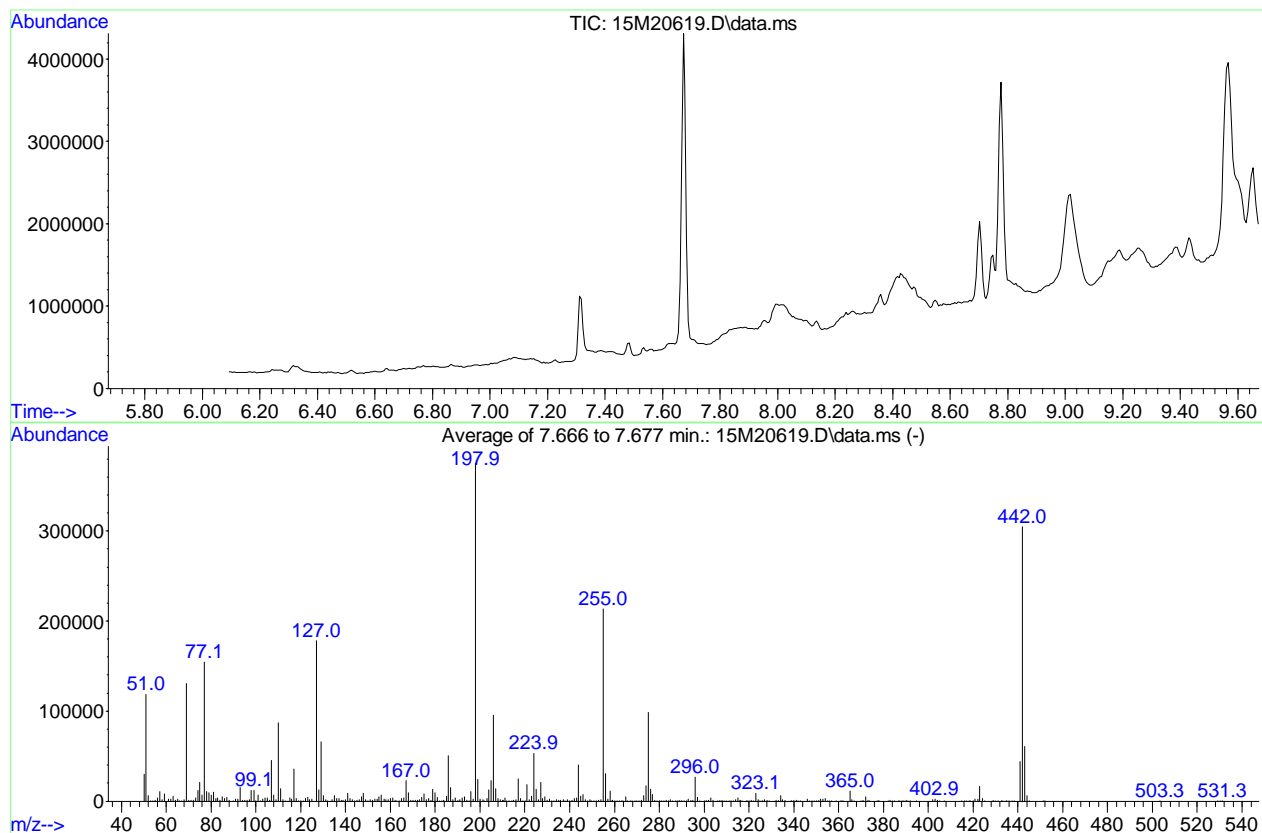
response 494510

Ion	Exp%	Act%
235.00	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20619.D
 Acq On : 2 Mar 2017 11:12 am
 Operator : SCB/LJH
 Sample : WG604728-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Integration File: RTEINT.P

Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 Last Update : Tue Feb 21 13:57:17 2017

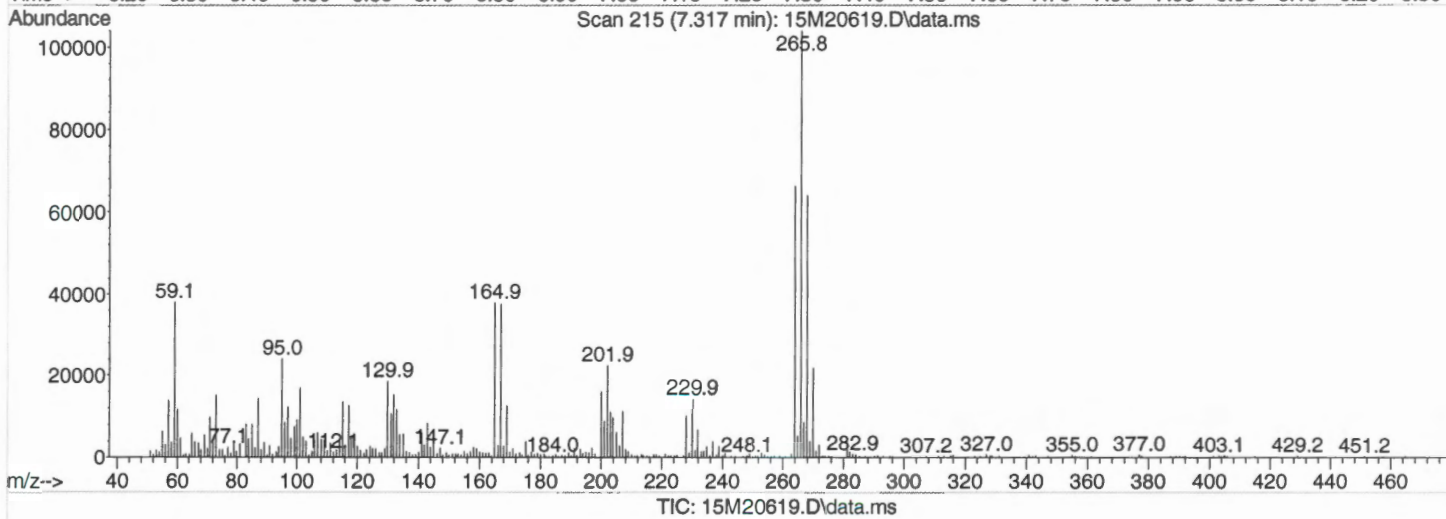
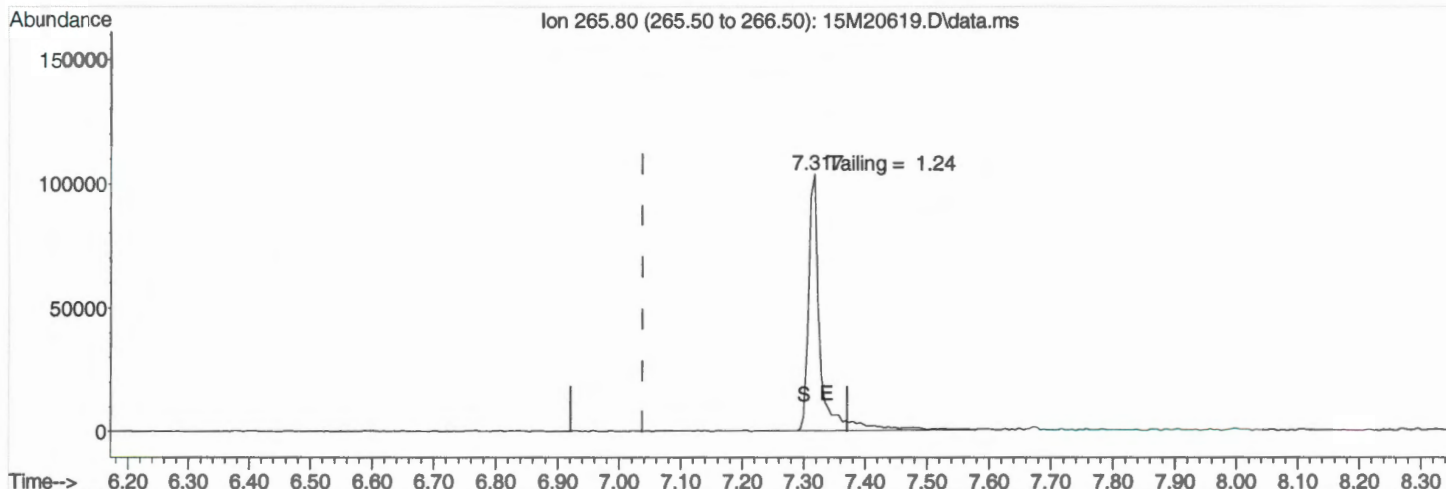


AutoFind: Scans 276, 277, 278; Background Corrected with Scan 264

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	30	60	31.6	118773	PASS
68	69	0.00	2	1.4	1800	PASS
69	198	0.00	100	34.8	130621	PASS
70	69	0.00	2	0.9	1147	PASS
127	198	40	60	47.4	178133	PASS
197	198	0.00	1	0.6	2235	PASS
198	198	100	100	100.0	375468	PASS
199	198	5	9	6.4	24166	PASS
275	198	10	30	26.2	98331	PASS
365	198	1	100	3.0	11395	PASS
441	443	0.01	100	72.3	43960	PASS
442	198	40	100	81.1	304640	PASS
443	442	17	23	20.0	60808	PASS

Data Path : C:\msdchem\1\data\030217\
Data File : 15M20619.D
Acq On : 2 Mar 2017 11:12 am
Operator : SCB/LJH
Sample : WG604728-01 5PPM LL DFTPP
Misc : 1,1 STD80383
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 02 11:23:07 2017
Quant Method : C:\msdchem\1\methods\DFTPPQ.M
Quant Title : DFTPP
QLast Update : Tue Sep 13 14:03:54 2016
Response via : Initial Calibration



(1) Pentachlorophenol

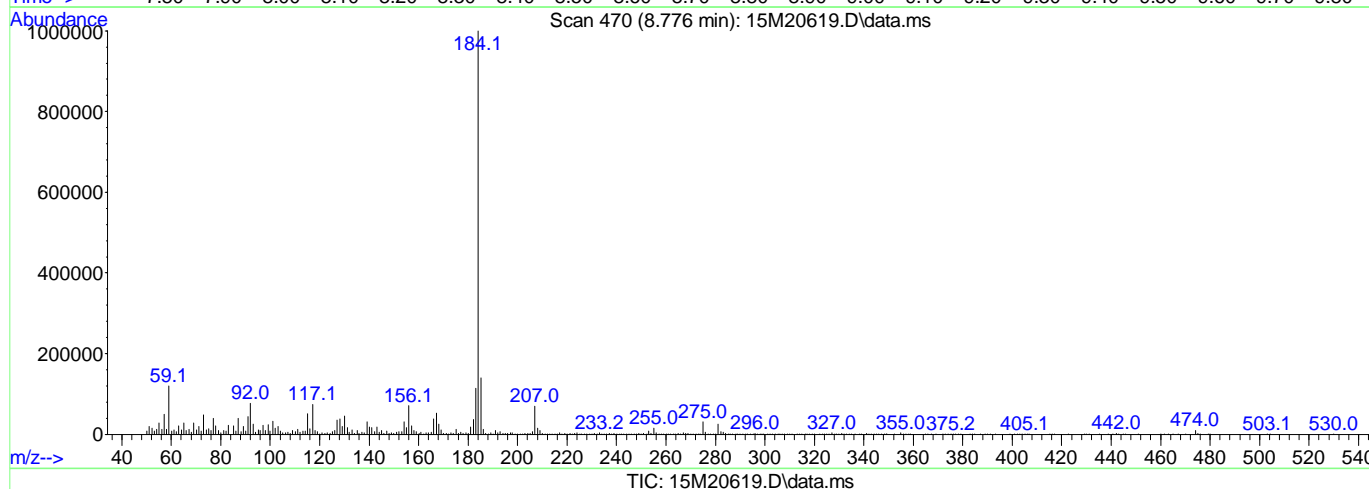
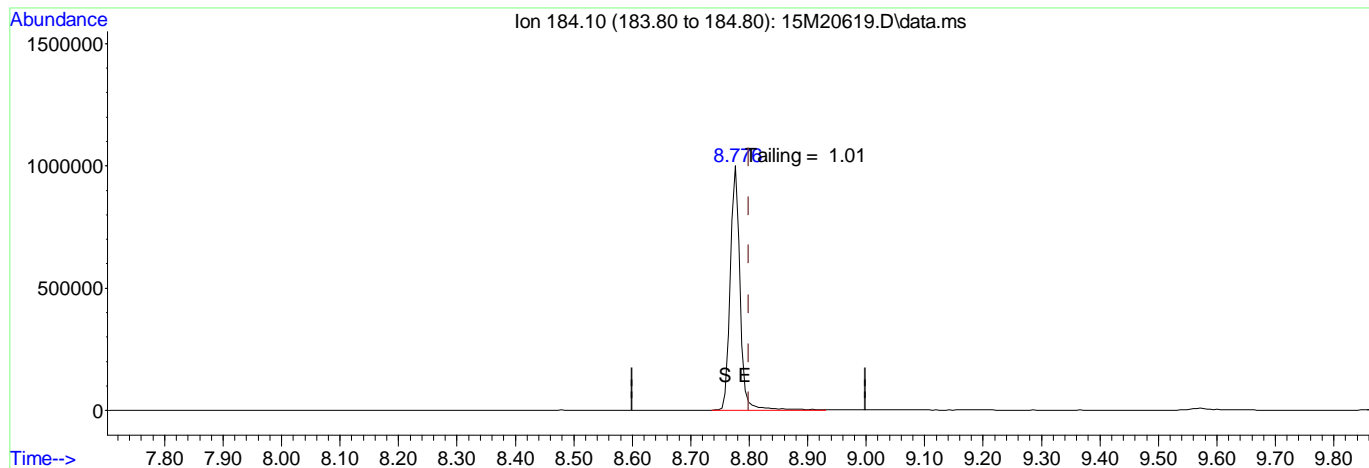
7.317min (+ 0.280) 0.00 ug/ml

response 118835

Ion	Exp%	Act%
265.80	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20619.D
 Acq On : 2 Mar 2017 11:12 am
 Operator : SCB/LJH
 Sample : WG604728-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 02 11:23:07 2017
 Quant Method : C:\msdchem\1\methods\DFTPPQ.M
 Quant Title : DFTPP
 QLast Update : Tue Sep 13 14:03:54 2016
 Response via : Initial Calibration



(2) Benzidine

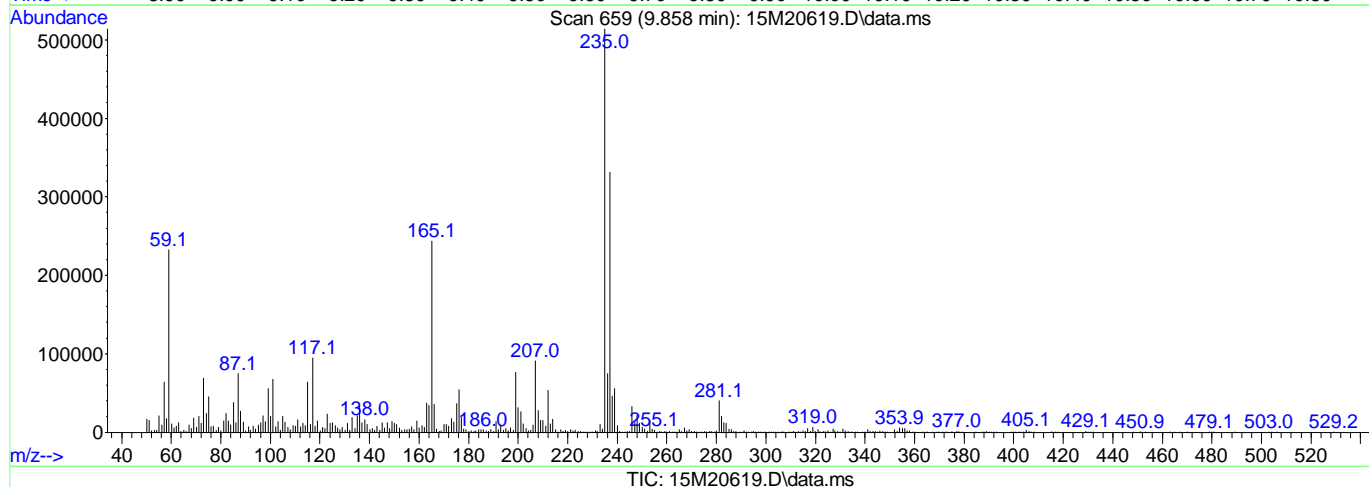
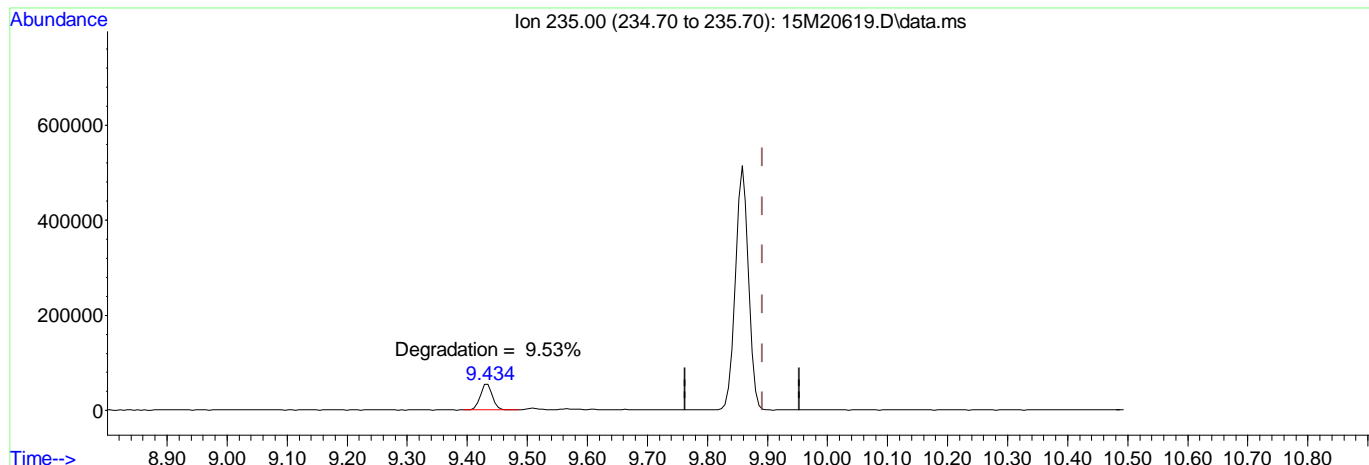
8.776min (-0.023) 0.00 ug/ml mint

response 1169991

Ion	Exp%	Act%
184.10	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030217\
 Data File : 15M20619.D
 Acq On : 2 Mar 2017 11:12 am
 Operator : SCB/LJH
 Sample : WG604728-01 5PPM LL DFTPP
 Misc : 1,1 STD80383
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 02 11:23:07 2017
 Quant Method : C:\msdchem\1\methods\DFTPPQ.M
 Quant Title : DFTPP
 QLast Update : Tue Sep 13 14:03:54 2016
 Response via : Initial Calibration



(3) DDT

9.858min (-0.034) 0.00 ug/ml

response 793874

Ion	Exp%	Act%
235.00	100.00	100.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20597.D
 Acq On : 1 Mar 2017 2:14 pm
 Operator : SCB/LJH
 Sample : WG604087-01 BLANK
 Misc : 1,1 STD80097
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 02 15:26:49 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

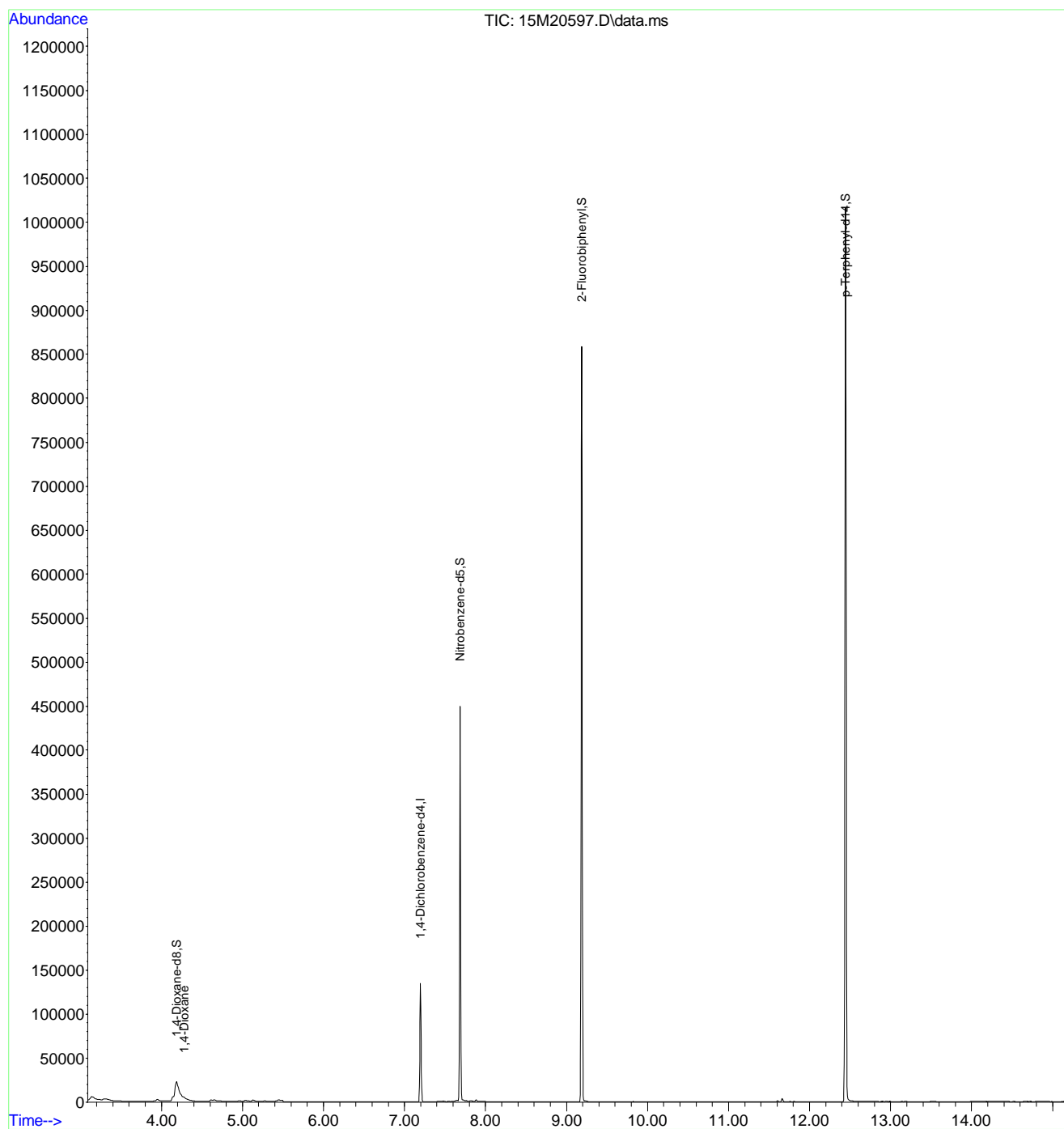
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

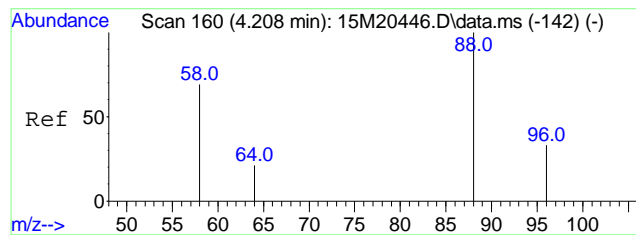
Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	56747	1.0000	ug/mL	# 0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.186	96	60493	3.0738	ug/L	0.04
Spiked Amount	5.000		Recovery	=	61.40%	
4) Nitrobenzene-d5	7.689	82	237275	5.0702	ug/L	0.02
Spiked Amount	5.000		Recovery	=	101.40%	
5) 2-Fluorobiphenyl	9.188	172	573537	4.4070	ug/L	0.02
Spiked Amount	5.000		Recovery	=	88.20%	
6) p-Terphenyl-d14	12.446	244	888927	6.1237	ug/L	0.03
Spiked Amount	5.000		Recovery	=	122.40%	
Target Compounds						
2) 1,4-Dioxane	4.278	58	8023	0.4836	ug/L	# 1

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

Data Path : C:\msdchem\1\data\030117\
Data File : 15M20597.D
Acq On : 1 Mar 2017 2:14 pm
Operator : SCB/LJH
Sample : WG604087-01 BLANK
Misc : 1,1 STD80097
ALS Vial : 3 Sample Multiplier: 1

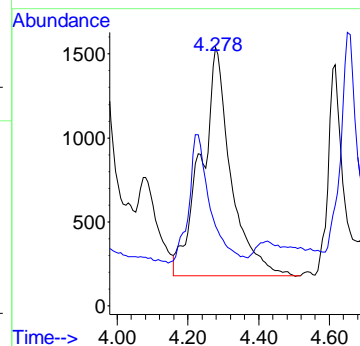
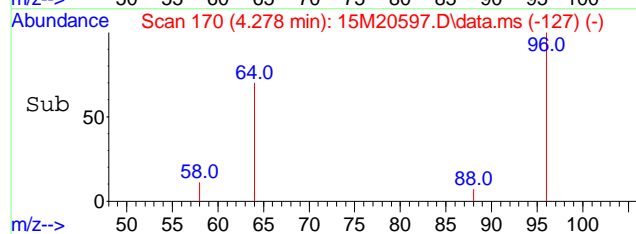
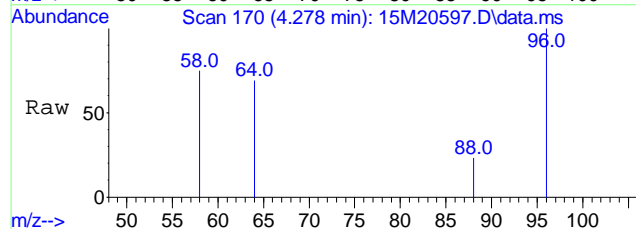
Quant Time: Mar 02 15:26:49 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration





#2
1,4-Dioxane
Concen: 0.48 ug/L
RT: 4.278 min Scan# 170
Delta R.T. 0.092 min
Lab File: 15M20597.D
Acq: 1 Mar 2017 2:14 pm

Tgt Ion: 58 Resp: 8023
Ion Ratio Lower Upper
58 100
88 0.0 127.3 190.9#



Data Path : C:\msdchem\1\data\030117\
 Data File : 15M20598.D
 Acq On : 1 Mar 2017 2:37 pm
 Operator : SCB/LJH
 Sample : WG604087-02 LCS
 Misc : 1,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 02 15:27:56 2017
 Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
 Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
 QLast Update : Tue Feb 21 13:57:17 2017
 Response via : Initial Calibration

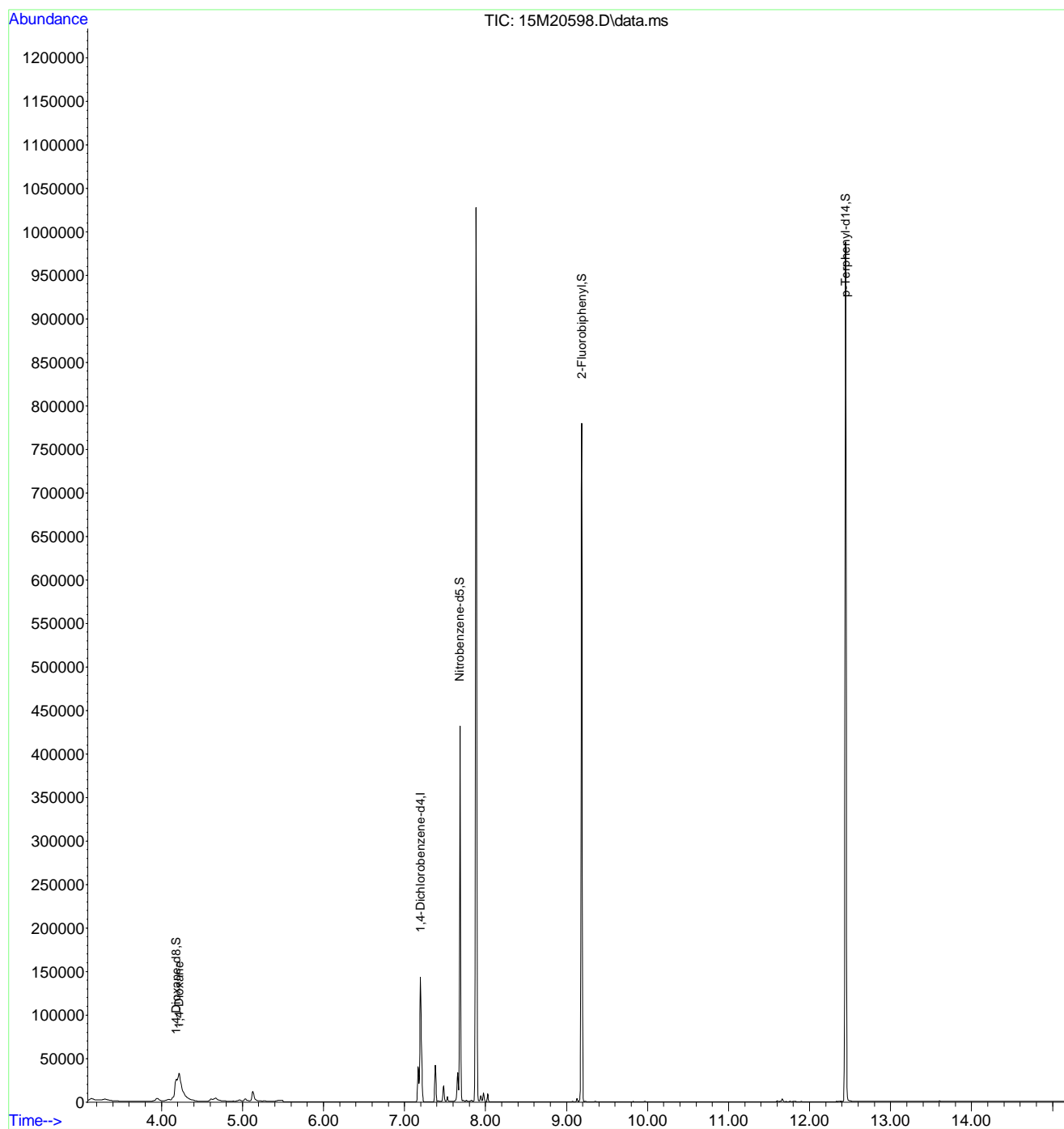
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-Dichlorobenzene-d4	7.198	152	58088	1.0000	ug/mL	# 0.02
System Monitoring Compounds						
3) 1,4-Dioxane-d8	4.179	96	52112	2.5868	ug/L	0.03
Spiked Amount	5.000		Recovery	=	51.80%	
4) Nitrobenzene-d5	7.683	82	223424	4.6640	ug/L	0.02
Spiked Amount	5.000		Recovery	=	93.20%	
5) 2-Fluorobiphenyl	9.188	172	518331	3.8909	ug/L	0.02
Spiked Amount	5.000		Recovery	=	77.80%	
6) p-Terphenyl-d14	12.446	244	844482	5.6832	ug/L	0.03
Spiked Amount	5.000		Recovery	=	113.60%	
Target Compounds						
2) 1,4-Dioxane	4.214	58	43732	2.5750	ug/L	Qvalue 84

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

Data Path : C:\msdchem\1\data\030117\
Data File : 15M20598.D
Acq On : 1 Mar 2017 2:37 pm
Operator : SCB/LJH
Sample : WG604087-02 LCS
Misc : 1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 02 15:27:56 2017
Quant Method : C:\msdchem\1\methods\DIOXANE_D8.M
Quant Title : OVD MSS01 SIM 1,4-dioxane ICAL 012517
QLast Update : Tue Feb 21 13:57:17 2017
Response via : Initial Calibration



DIOXANE_D8.M Thu Mar 02 15:27:57 2017

Page: 2

2.3 Metals Data

2.3.1 Metals I C P Data

2.3.1.1 Summary Data

Lab Report #: L17021201

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17021201-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP650-6418-GRAB	Prep Method: 3015	Prep Date: 02/24/2017 09:13
Matrix: Water	Analytical Method: 6010C	Cal Date: 02/28/2017 15:34
Workgroup #: WG604140	Analyst: KKB	Run Date: 02/28/2017 18:39
Collect Date: 02/22/2017 10:00	Dilution: 1	File ID: T4.022817.183922
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0800	U	0.0800	0.0800	0.0400
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.1.2 QC Summary Data

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Workgroup: WG604065
 Analyst: AC
 Spike Analyst: AC
 Run Date: 02/24/2017 09:13
 Method: 3015
 Balance: BAL019
 Instrument: MW-1
 Instrument Start: 02/24/2017 09:12

SOP: ME407 Revision 19
 Spike Solution: STD80130
 Spike Witness: VC
 HNO3 Lot #: COA19483
 HCL Lot #: COA19441
 ICP FILTERS LOT#R6EA4780RGT38286
 TEFLON CHIPS-D1069103 LoRGT35873
 cent tubes- lot# 2291600RGT38882
 40 & 50 ML. DIGESTION TUCOA19487

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG604065-02	BLANK	1	40 mL	50 mL	204.451 g	204.45 g	
2	WG604065-03	LCS	1	40 mL	50 mL	212.05 g	212.045 g	5 mL
3	L17021170-02	SAMP	1	1 mL	50 mL	204.519 g	204.512 g	03/03/17
4	L17021170-05	SAMP	1	1 mL	50 mL	207.419 g	207.406 g	03/03/17
5	L17021191-01	SAMP	1	40 mL	50 mL	206.551 g	206.535 g	03/02/17
6	L17021191-02	SAMP	1	40 mL	50 mL	205.221 g	205.219 g	03/02/17
7	L17021191-03	SAMP	1	40 mL	50 mL	206.379 g	206.368 g	03/02/17
8	L17021191-04	SAMP	1	40 mL	50 mL	207.659 g	207.644 g	03/02/17
9	L17021191-05	SAMP	1	40 mL	50 mL	206.562 g	206.542 g	03/02/17
10	L17021191-06	SAMP	1	40 mL	50 mL	204.507 g	204.491 g	03/02/17
11	L17021201-01	SAMP	1	40 mL	50 mL	204.804 g	204.793 g	03/06/17
12	L17021203-01	SAMP	1	40 mL	50 mL	204.386 g	204.374 g	03/06/17
13	L17021250-01	SAMP	1	40 mL	50 mL	205.312 g	205.307 g	03/06/17
14	L17021253-04	SAMP	1	40 mL	50 mL	204.913 g	204.892 g	03/03/17
15	L17021253-06	SAMP	1	40 mL	50 mL	204.658 g	204.645 g	03/03/17
16	L17021256-01	SAMP	1	40 mL	50 mL	206.022 g	206.01 g	03/06/17
17	L17021259-01	SAMP	1	40 mL	50 mL	206.044 g	206.027 g	03/06/17
18	L17021261-01	SAMP	1	40 mL	50 mL	206.029 g	206.011 g	03/06/17
19	L17021261-02	SAMP	1	40 mL	50 mL	204.083 g	204.062 g	03/06/17
20	L17021261-03	SAMP	1	40 mL	50 mL	206.681 g	206.667 g	03/06/17
21	L17021261-04	SAMP	1	40 mL	50 mL	204.748 g	204.721 g	03/06/17
22	WG604065-01	REF	1	40 mL	50 mL	207.428 g	207.404 g	
23	L17021261-05	SAMP	1	40 mL	50 mL	207.428 g	207.404 g	03/06/17
24	WG604065-04	MS	1	40 mL	50 mL	211.075 g	211.047 g	5 mL
25	WG604065-05	MSD	1	40 mL	50 mL	211.147 g	211.138 g	5 mL

L17021201-01	Filtered Digestate
L17021203-01	Filtered Digestate
L17021250-01	Filtered Digestate
L17021253-04	Filtered Digestate
L17021253-06	Filtered Digestate
L17021256-01	Filtered Digestate

MW_DIG - Modified 09/30/2009
 PDF ID: 5172452
 Report generated: 02/24/2017 11:07



Analyst: Amber R. Cochran

SOP: _____
Spike Solution: [Signature]
Reviewer: _____
Spike Witness: _____

Method:
Balance:
Instrument:
Instrument Start:



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022717T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____

Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80226 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 604140,604317,604323,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.022717.145029	WG604433-01	Calibration Point		1		02/27/17 14:50
2	T4.022717.145419	WG604433-02	Calibration Point		1		02/27/17 14:54
3	T4.022717.145809	WG604433-03	Calibration Point		1		02/27/17 14:58
4	T4.022717.150159	WG604433-04	Calibration Point		1		02/27/17 15:01
5	T4.022717.150535	WG604433-05	Calibration Point		1		02/27/17 15:05
6	T4.022717.150905	WG604433-06	Initial Calibration Verification		1		02/27/17 15:09
7	T4.022717.151241	WG604433-07	Initial Calib Blank		1		02/27/17 15:12
8	T4.022717.151630	WG604433-08	Low Level Initial Calibration V		1		02/27/17 15:16
9	T4.022717.152019	WG604433-09	LLICV		1		02/27/17 15:20
10	T4.022717.152408	WG604433-10	Low Level Initial Calibration V		1		02/27/17 15:24
11	T4.022717.153311	WG604433-11	Interference Check		1		02/27/17 15:33
12	T4.022717.153659	WG604433-12	Interference Check		1		02/27/17 15:36
13	T4.022717.154039	WG604433-13	CCV		1		02/27/17 15:40
14	T4.022717.154413	WG604433-14	CCB		1		02/27/17 15:44
15	T4.022717.160259	WG604065-02	Method/Prep Blank	40/50	1		02/27/17 16:02
16	T4.022717.160649	WG604065-03	Laboratory Control S	40/50	1		02/27/17 16:06
17	T4.022717.161030	L17021170-02	PERMEATE	1/50	1		02/27/17 16:10
18	T4.022717.161418	L17021170-05	N. DOCK FLUME	1/50	1		02/27/17 16:14
19	T4.022717.161806	L17021191-01	15-12-8 W1	40/50	1		02/27/17 16:18
20	T4.022717.162152	L17021191-02	15-12-8 W2	40/50	1		02/27/17 16:21
21	T4.022717.162540	L17021191-03	15-13-23 S3	40/50	1		02/27/17 16:25
22	T4.022717.162926	L17021191-04	15-13-23 S2	40/50	1		02/27/17 16:29
23	T4.022717.163314	WG604140-01	Post Digestion Spike		1	L17021191-04	02/27/17 16:33
24	T4.022717.163655	WG604140-02	Serial Dilution		5	L17021191-04	02/27/17 16:36
25	T4.022717.164045	WG604433-15	CCV		1		02/27/17 16:40
26	T4.022717.164418	WG604433-16	CCB		1		02/27/17 16:44
27	T4.022717.164809	L17021191-05	15-13-24 P1	40/50	1		02/27/17 16:48
28	T4.022717.165155	L17021191-06	15-13-24 S1	40/50	1		02/27/17 16:51
29	T4.022717.165541	L17021201-01	LH18/24-SP650-6418-GRAB	40/50	1		02/27/17 16:55
30	T4.022717.165937	L17021203-01	LH18/24-SP140-7418-GRAB	40/50	1		02/27/17 16:59
31	T4.022717.170330	L17021250-01	INS-WL02-022217	40/50	1		02/27/17 17:03
32	T4.022717.170714	L17021253-04	PZ104-GW-022217	40/50	1		02/27/17 17:07
33	T4.022717.171124	L17021253-06	PZ105-GW-022317	40/50	1		02/27/17 17:11
34	T4.022717.171517	L17021256-01	INS-WL03-022217	40/50	1		02/27/17 17:15

Page: 1 Approved: February 28, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022717T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

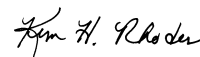
Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80226 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 604140,604317,604323,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.022717.171902	L17021259-01	INS-WL01-022217	40/50	1		02/27/17 17:19
36	T4.022717.172247	L17021261-01	MW31-GW-022117	40/50	1		02/27/17 17:22
37	T4.022717.172633	WG604433-17	CCV		1		02/27/17 17:26
38	T4.022717.173008	WG604433-18	CCB		1		02/27/17 17:30
39	T4.022717.173359	L17021261-02	MW32-GW-022117	40/50	1		02/27/17 17:33
40	T4.022717.173746	L17021261-03	TCF-EB01-022117	40/50	1		02/27/17 17:37
41	T4.022717.174135	L17021261-04	MW28-GW-022217	40/50	1		02/27/17 17:41
42	T4.022717.174553	WG604065-01	Reference Sample		1	L17021261-05	02/27/17 17:45
43	T4.022717.174949	WG604065-04	Matrix Spike	40/50	1	L17021261-05	02/27/17 17:49
44	T4.022717.175338	WG604065-05	Matrix Spike Duplica	40/50	1	L17021261-05	02/27/17 17:53
45	T4.022717.175730	WG604433-19	CCV		1		02/27/17 17:57
46	T4.022717.180105	WG604433-20	CCB		1		02/27/17 18:01
47	T4.022717.182317	WG604236-02	Method/Prep Blank	40/50	1		02/27/17 18:23
48	T4.022717.182707	WG604236-03	Laboratory Control S	40/50	1		02/27/17 18:27
49	T4.022717.183049	WG603954-01	Fluid Blank 1		1		02/27/17 18:30
50	T4.022717.183437	WG603954-02	Fluid Blank 1		1		02/27/17 18:34
51	T4.022717.183827	L17021197-01	K7B0767-01	5/50	1		02/27/17 18:38
52	T4.022717.184212	L17021200-01	K7B0765-01	5/50	1		02/27/17 18:42
53	T4.022717.184556	L17021200-02	K7B0765-02	5/50	1		02/27/17 18:45
54	T4.022717.184939	L17021228-01	J7B1157-01	5/50	1		02/27/17 18:49
55	T4.022717.185324	WG604317-01	Post Digestion Spike		1	L17021228-01	02/27/17 18:53
56	T4.022717.185703	WG604317-02	Serial Dilution		5	L17021228-01	02/27/17 18:57
57	T4.022717.190052	WG604433-21	CCV		1		02/27/17 19:00
58	T4.022717.190427	WG604433-22	CCB		1		02/27/17 19:04
59	T4.022717.190818	L17021228-02	J7B1157-02	5/50	1		02/27/17 19:08
60	T4.022717.191204	L17021260-01	INS-WL04-022217	40/50	1		02/27/17 19:12
61	T4.022717.191552	L17021324-01	TCF-EB01-022317	40/50	1		02/27/17 19:15
62	T4.022717.191942	L17021324-02	MW35-GW-022317	40/50	1		02/27/17 19:19
63	T4.022717.192401	WG604236-01	Reference Sample		1	L17021324-03	02/27/17 19:24
64	T4.022717.192819	WG604236-04	Matrix Spike	40/50	1	L17021324-03	02/27/17 19:28
65	T4.022717.193232	WG604236-05	Matrix Spike Duplica	40/50	1	L17021324-03	02/27/17 19:32
66	T4.022717.193646	L17021324-06	TCF-EB02-022317	40/50	1		02/27/17 19:36
67	T4.022717.194035	L17021324-07	MW21-GW-022317	40/50	1		02/27/17 19:40
68	T4.022717.194453	L17021334-01	91701-A03-WQ-W0010	40/50	1		02/27/17 19:44

Page: 2 Approved: February 28, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022717T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

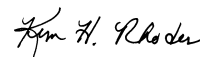
Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80226 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 604140,604317,604323,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.022717.194844	WG604433-23	CCV		1		02/27/17 19:48
70	T4.022717.195219	WG604433-24	CCB		1		02/27/17 19:52
71	T4.022717.195608	L17021346-01	FQC-WW04-W0017	40/50	1		02/27/17 19:56
72	T4.022717.195956	L17021346-02	FQC-WW06-W0018	40/50	1		02/27/17 19:59
73	T4.022717.200345	L17021353-01	46004-G23-WQ-W0032	40/50	1		02/27/17 20:03
74	T4.022717.200734	L17021353-02	46004-G37-WQ-W0061	40/50	1		02/27/17 20:07
75	T4.022717.201122	L17021353-03	46013-G086-WQ-W0107	40/50	1		02/27/17 20:11
76	T4.022717.201511	L17021353-04	46013-G105-WQ-W0132	40/50	1		02/27/17 20:15
77	T4.022717.201900	WG604433-25	CCV		1		02/27/17 20:19
78	T4.022717.202236	WG604433-26	CCB		1		02/27/17 20:22
79	T4.022717.202625	WG604433-27	Low Level Continuing Calibra		1		02/27/17 20:26
80	T4.022717.203013	WG604433-28	LLCCV		1		02/27/17 20:30
81	T4.022717.203401	WG604433-29	Low Level Continuing Calibra		1		02/27/17 20:34
82	T4.022717.203749	WG604241-02	Method/Prep Blank	40/50	1		02/27/17 20:37
83	T4.022717.204139	WG604241-03	Laboratory Control S	40/50	1		02/27/17 20:41
84	T4.022717.204521	L17021253-02	PZ101-GW-022217	40/50	1		02/27/17 20:45
85	T4.022717.204914	L17021265-01	0303-109 S1	40/50	1		02/27/17 20:49
86	T4.022717.205301	L17021265-02	0303-109 S2	40/50	1		02/27/17 20:53
87	T4.022717.205647	L17021265-03	0303-109 S3	40/50	1		02/27/17 20:56
88	T4.022717.210034	L17021265-04	0303-109 S4	40/50	1		02/27/17 21:00
89	T4.022717.210420	L17021265-05	0303-109 S6	40/50	1		02/27/17 21:04
90	T4.022717.210807	WG604323-01	Post Digestion Spike		1	L17021265-05	02/27/17 21:08
91	T4.022717.211148	WG604323-02	Serial Dilution		5	L17021265-05	02/27/17 21:11
92	T4.022717.211536	WG604433-30	CCV		1		02/27/17 21:15
93	T4.022717.211912	WG604433-31	CCB		1		02/27/17 21:19
94	T4.022717.212301	L17021265-06	0303-109 S5	40/50	1		02/27/17 21:23
95	T4.022717.212647	L17021266-01	0303-107 S2	40/50	1		02/27/17 21:26
96	T4.022717.213033	L17021266-02	0303-107 S1	40/50	1		02/27/17 21:30
97	T4.022717.213419	L17021267-01	2212-124 W1	40/50	1		02/27/17 21:34
98	T4.022717.213805	L17021267-02	2212-124 S1	40/50	1		02/27/17 21:38
99	T4.022717.214151	L17021268-01	2211-108 P1	40/50	1		02/27/17 21:41
100	T4.022717.214538	L17021268-02	2211-108 S1	40/50	1		02/27/17 21:45
101	T4.022717.214924	L17021269-01	0303-110 S1	40/50	1		02/27/17 21:49
102	T4.022717.215310	L17021269-02	0303-110 S2	40/50	1		02/27/17 21:53

Page: 3 Approved: February 28, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022717T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80226 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 604140,604317,604323,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.022717.215657	L17021269-03	0303-110 S3	40/50	1		02/27/17 21:56
104	T4.022717.220043	WG604433-32	CCV		1		02/27/17 22:00
105	T4.022717.220417	WG604433-33	CCB		1		02/27/17 22:04
106	T4.022717.220807	WG604241-01	Reference Sample		1	L17021269-04	02/27/17 22:08
107	T4.022717.221153	WG604241-04	Matrix Spike	40/50	1	L17021269-04	02/27/17 22:11
108	T4.022717.221535	WG604241-05	Matrix Spike Duplica	40/50	1	L17021269-04	02/27/17 22:15
109	T4.022717.221917	L17021270-01	2211-110 W1	40/50	1		02/27/17 22:19
110	T4.022717.222303	L17021270-02	2211-110 P1	40/50	1		02/27/17 22:23
111	T4.022717.222650	L17021273-01	6-10-24.10 W1	40/50	1		02/27/17 22:26
112	T4.022717.223036	WG604433-34	CCV		1		02/27/17 22:30
113	T4.022717.223411	WG604433-35	CCB		1		02/27/17 22:34
114	T4.022717.223800	WG604286-02	Method/Prep Blank	40/50	1		02/27/17 22:38
115	T4.022717.224149	WG604286-03	Laboratory Control S	40/50	1		02/27/17 22:41
116	T4.022717.224530	L17021262-01	MW39-GW-022017	40/50	1		02/27/17 22:45
117	T4.022717.224915	L17021262-02	MW37-GW-022017	40/50	1		02/27/17 22:49
118	T4.022717.225333	L17021262-03	MW36-GW-022117	40/50	1		02/27/17 22:53
119	T4.022717.225719	L17021262-04	MW38-GW-022117	40/50	1		02/27/17 22:57
120	T4.022717.230130	L17021327-01	BSUMP-SW-0222317	40/50	1		02/27/17 23:01
121	T4.022717.230521	L17021327-02	BSUMP-SW-0222317		1	WG604286-01	02/27/17 23:05
122	T4.022717.230908	WG604286-04	Matrix Spike	40/50	1	L17021327-02	02/27/17 23:09
123	T4.022717.231249	WG604286-05	Matrix Spike Duplica	40/50	1	L17021327-02	02/27/17 23:12
124	T4.022717.231632	WG604433-36	CCV		1		02/27/17 23:16
125	T4.022717.232007	WG604433-37	CCB		1		02/27/17 23:20
126	T4.022717.232359	L17021359-01	6-10-19.03 W1	40/50	1		02/27/17 23:23
127	T4.022717.232746	WG604329-01	Post Digestion Spike		1	L17021359-01	02/27/17 23:27
128	T4.022717.233128	WG604329-02	Serial Dilution		5	L17021359-01	02/27/17 23:31
129	T4.022717.233518	WG604433-38	CCV		1		02/27/17 23:35
130	T4.022717.233854	WG604433-39	CCB		1		02/27/17 23:38
131	T4.022717.234246	WG604433-40	Interference Check		1		02/27/17 23:42
132	T4.022717.234634	WG604433-41	Interference Check		1		02/27/17 23:46
133	T4.022717.235016	WG604433-42	CCV		1		02/27/17 23:50
134	T4.022717.235352	WG604433-43	CCB		1		02/27/17 23:53

Page: 4 Approved: February 28, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

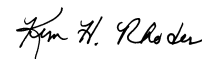
Instrument: ICP-THERMO4 Dataset: 022817T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80691 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 604474,604140,604317,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.022817.151905	WG604624-01	Calibration Point		1		02/28/17 15:19
2	T4.022817.152254	WG604624-02	Calibration Point		1		02/28/17 15:22
3	T4.022817.152643	WG604624-03	Calibration Point		1		02/28/17 15:26
4	T4.022817.153033	WG604624-04	Calibration Point		1		02/28/17 15:30
5	T4.022817.153410	WG604624-05	Calibration Point		1		02/28/17 15:34
6	T4.022817.153742	WG604624-06	Initial Calibration Verification		1		02/28/17 15:37
7	T4.022817.154202	WG604624-07	Initial Calib Blank		1		02/28/17 15:42
8	T4.022817.154551	WG604624-08	LLICV		1		02/28/17 15:45
9	T4.022817.154939	WG604624-09	Low Level Initial Calibration V		1		02/28/17 15:49
10	T4.022817.155328	WG604624-10	Low Level Initial Calibration V		1		02/28/17 15:53
11	T4.022817.155716	WG604624-11	Interference Check		1		02/28/17 15:57
12	T4.022817.160103	WG604624-12	Interference Check		1		02/28/17 16:01
13	T4.022817.160445	WG604624-13	CCV		1		02/28/17 16:04
14	T4.022817.160821	WG604624-14	CCB		1		02/28/17 16:08
15	T4.022817.162946	WG604422-02	Method/Prep Blank	5/50	1		02/28/17 16:29
16	T4.022817.163335	WG604422-03	Laboratory Control S	5/50	1		02/28/17 16:33
17	T4.022817.163717	WG604263-01	Fluid Blank 1		1		02/28/17 16:37
18	T4.022817.164107	WG604265-01	Fluid Blank 1		1		02/28/17 16:41
19	T4.022817.164456	WG604265-02	Fluid Blank 2		1		02/28/17 16:44
20	T4.022817.164846	L17021319-01	60500-SSP0330-SSP1330	5/50	1		02/28/17 16:48
21	T4.022817.165234	WG604422-01	Reference Sample		1	L17021347-02	02/28/17 16:52
22	T4.022817.165619	WG604422-04	Matrix Spike	5/50	1	L17021347-02	02/28/17 16:56
23	T4.022817.165959	WG604422-05	Matrix Spike Duplica	5/50	1	L17021347-02	02/28/17 16:59
24	T4.022817.170338	L17021352-01	J7B1258-01	5/50	1		02/28/17 17:03
25	T4.022817.170734	WG604624-15	CCV		1		02/28/17 17:07
26	T4.022817.171109	WG604624-16	CCB		1		02/28/17 17:11
27	T4.022817.171500	L17021352-02	J7B1258-01		1		02/28/17 17:15
28	T4.022817.171853	L17021352-03	J7B1258-02		1		02/28/17 17:18
29	T4.022817.172245	L17021352-04	J7B1258-03		1		02/28/17 17:22
30	T4.022817.172638	L17021352-05	J7B1258-04	5/50	1		02/28/17 17:26
31	T4.022817.173026	L17021352-06	J7B1258-04		1		02/28/17 17:30
32	T4.022817.173418	L17021352-07	J7B1258-05		1		02/28/17 17:34
33	T4.022817.173811	L17021352-08	J7B1258-06		1		02/28/17 17:38
34	T4.022817.174205	L17021352-09	J7B1258-07		1		02/28/17 17:42

Page: 1 Approved: March 01, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022817T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80691 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 604474,604140,604317,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.022817.174600	L17021352-10	J7B1258-08	5/50	1		02/28/17 17:46
36	T4.022817.174954	L17021352-11	J7B1258-08		1		02/28/17 17:49
37	T4.022817.175349	WG604624-17	CCV		1		02/28/17 17:53
38	T4.022817.175725	WG604624-18	CCB		1		02/28/17 17:57
39	T4.022817.180116	L17021352-12	J7B1258-09	5/50	1		02/28/17 18:01
40	T4.022817.180509	WG604474-01	Post Digestion Spike		1	L17021352-12	02/28/17 18:05
41	T4.022817.180900	WG604474-02	Serial Dilution		5	L17021352-12	02/28/17 18:09
42	T4.022817.181248	L17021352-13	J7B1258-09		1		02/28/17 18:12
43	T4.022817.181641	L17021367-01	KAISER 9 BAGS	5/50	1		02/28/17 18:16
44	T4.022817.182027	L17021368-01	AWV 24 BAGS	5/50	1		02/28/17 18:20
45	T4.022817.182418	WG604624-19	CCV		1		02/28/17 18:24
46	T4.022817.182755	WG604624-20	CCB		1		02/28/17 18:27
47	T4.022817.183149	WG604065-02	Method/Prep Blank	40/50	1		02/28/17 18:31
48	T4.022817.183539	WG604065-03	Laboratory Control S	40/50	1		02/28/17 18:35
49	T4.022817.183922	L17021201-01	LH18/24-SP650-6418-GRAB	40/50	1		02/28/17 18:39
50	T4.022817.184317	L17021203-01	LH18/24-SP140-7418-GRAB	40/50	1		02/28/17 18:43
51	T4.022817.184711	WG604140-03	Post Digestion Spike		1	L17021203-01	02/28/17 18:47
52	T4.022817.185100	WG604140-04	Serial Dilution		5	L17021203-01	02/28/17 18:51
53	T4.022817.185456	L17021253-04	PZ104-GW-022217		10		02/28/17 18:54
54	T4.022817.185843	L17021253-06	PZ105-GW-022317		10		02/28/17 18:58
55	T4.022817.190232	WG604624-21	CCV		1		02/28/17 19:02
56	T4.022817.190608	WG604624-22	CCB		1		02/28/17 19:06
57	T4.022817.191000	WG604065-01	Reference Sample		1	L17021261-05	02/28/17 19:10
58	T4.022817.191354	WG604065-04	Matrix Spike	40/50	1	L17021261-05	02/28/17 19:13
59	T4.022817.191744	WG604065-05	Matrix Spike Duplica	40/50	1	L17021261-05	02/28/17 19:17
60	T4.022817.192136	WG604624-23	CCV		1		02/28/17 19:21
61	T4.022817.192513	WG604624-24	CCB		1		02/28/17 19:25
62	T4.022817.192903	WG604236-02	Method/Prep Blank	40/50	1		02/28/17 19:29
63	T4.022817.193252	WG604236-03	Laboratory Control S	40/50	1		02/28/17 19:32
64	T4.022817.193635	WG603954-01	Fluid Blank 1		1		02/28/17 19:36
65	T4.022817.194024	WG603954-02	Fluid Blank 1		1		02/28/17 19:40
66	T4.022817.194414	L17021197-01	K7B0767-01	5/50	1		02/28/17 19:44
67	T4.022817.194800	L17021200-01	K7B0765-01	5/50	1		02/28/17 19:48
68	T4.022817.195144	L17021200-02	K7B0765-02	5/50	1		02/28/17 19:51

Page: 2 Approved: March 01, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022817T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80691 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 604474,604140,604317,604329

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.022817.195526	L17021228-01	J7B1157-01	5/50	1		02/28/17 19:55
70	T4.022817.195913	L17021228-02	J7B1157-02	5/50	1		02/28/17 19:59
71	T4.022817.200259	L17021324-02	MW35-GW-022317	40/50	2		02/28/17 20:02
72	T4.022817.200712	WG604624-25	CCV		1		02/28/17 20:07
73	T4.022817.201048	WG604624-26	CCB		1		02/28/17 20:10
74	T4.022817.201438	WG604236-01	Reference Sample		2	L17021324-03	02/28/17 20:14
75	T4.022817.201851	WG604236-04	Matrix Spike	40/50	2	L17021324-03	02/28/17 20:18
76	T4.022817.202257	WG604236-05	Matrix Spike Duplica	40/50	2	L17021324-03	02/28/17 20:22
77	T4.022817.202703	L17021334-01	91701-A03-WQ-W0010	40/50	1		02/28/17 20:27
78	T4.022817.203052	L17021346-01	FQC-WW04-W0017	40/50	1		02/28/17 20:30
79	T4.022817.203440	L17021346-02	FQC-WW06-W0018	40/50	1		02/28/17 20:34
80	T4.022817.203829	L17021353-01	46004-G23-WQ-W0032	40/50	1		02/28/17 20:38
81	T4.022817.204218	L17021353-02	46004-G37-WQ-W0061	40/50	1		02/28/17 20:42
82	T4.022817.204607	L17021353-03	46013-G086-WQ-W0107	40/50	1		02/28/17 20:46
83	T4.022817.204958	WG604624-27	CCV		1		02/28/17 20:49
84	T4.022817.205335	WG604624-28	CCB		1		02/28/17 20:53
85	T4.022817.205724	L17021353-04	46013-G105-WQ-W0132	40/50	1		02/28/17 20:57
86	T4.022817.210114	WG604317-03	Post Digestion Spike		1	L17021353-04	02/28/17 21:01
87	T4.022817.210456	WG604317-04	Serial Dilution		5	L17021353-04	02/28/17 21:04
88	T4.022817.210846	WG604624-29	CCV		1		02/28/17 21:08
89	T4.022817.211224	WG604624-30	CCB		1		02/28/17 21:12
90	T4.022817.211614	WG604286-02	Method/Prep Blank	40/50	1		02/28/17 21:16
91	T4.022817.212004	WG604286-03	Laboratory Control S	40/50	1		02/28/17 21:20
92	T4.022817.212346	L17021327-01	BSUMP-SW-0222317	40/50	10		02/28/17 21:23
93	T4.022817.212733	WG604329-03	Post Digestion Spike		10	L17021327-01	02/28/17 21:27
94	T4.022817.213115	WG604329-04	Serial Dilution		50	L17021327-01	02/28/17 21:31
95	T4.022817.213502	L17021327-01	BSUMP-SW-0222317	40/50	1		02/28/17 21:35
96	T4.022817.213855	WG604286-01	Reference Sample		1	L17021327-02	02/28/17 21:38
97	T4.022817.214242	WG604286-04	Matrix Spike	40/50	1	L17021327-02	02/28/17 21:42
98	T4.022817.214624	WG604286-05	Matrix Spike Duplica	40/50	1	L17021327-02	02/28/17 21:46
99	T4.022817.215005	L17021253-02	PZ101-GW-022217	40/50	10		02/28/17 21:50
100	T4.022817.215355	WG604624-31	CCV		1		02/28/17 21:53
101	T4.022817.215732	WG604624-32	CCB		1		02/28/17 21:57
102	T4.022817.220122	WG604624-33	LLCCV		1		02/28/17 22:01

Page: 3 Approved: March 01, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 022817T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD80661 ICV Std: STD80660 Post Spike: STD80131
 ICSA: STD80691 ICSAB: STD80650 Int. Std: RGT37691
 CCV: ST80466 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

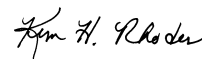
Workgroups: 604474,604140,604317,604329

Comments:

--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.022817.220511	WG604624-34	Low Level Continuing Calibra		1		02/28/17 22:05
104	T4.022817.220900	WG604624-35	Low Level Continuing Calibra		1		02/28/17 22:09
105	T4.022817.221248	WG604624-36	Interference Check		1		02/28/17 22:12
106	T4.022817.221636	WG604624-37	Interference Check		1		02/28/17 22:16
107	T4.022817.222017	WG604624-38	CCV		1		02/28/17 22:20
108	T4.022817.222355	WG604624-39	CCB		1		02/28/17 22:23

Page: 4 Approved: March 01, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 27-FEB-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 604433
 Runlog ID: 80679
 Analytical Workgroups: 604140,604317,604323,604329

Add'l WGs	
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	1250,1253,1256,1259,1261,1260,1324
	,1253,1327
Level 4	1201,1334,1346,1353,1262
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
28-FEB-2017

Secondary Reviewer:
28-FEB-2017

Ki K Beck

Kim H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 28-FEB-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 604624
 Runlog ID: 80709
 Analytical Workgroups: 604474,604140,604317,604329

Add'l WGs	
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	1324,1253,1327
Level 4	1319,1201,1203,1334,1346,1353
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
01-MAR-2017

Secondary Reviewer:
01-MAR-2017

Ki K Beck

Lyn H. Rhodes



Analytical Method:6010C
Login Number:L17021201

AAB#:WG604140

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6418-GRAB	01	02/22/17					02/24/2017	2	180		02/27/17	5.3	180	
LH18/24-SP650-6418-GRAB	01	02/22/17					02/24/2017	2	180		02/28/17	6.4	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5176586
Report generated 03/01/2017 12:04



METHOD BLANK SUMMARY

Login Number: L17021201 Work Group: WG604140
 Blank File ID: T4.022717.160259 Blank Sample ID: WG604065-02
 Prep Date: 02/24/17 09:13 Instrument ID: ICP-THERMO4
 Analyzed Date: 02/27/17 16:02 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG604065-03	T4.022717.160649	02/27/17 16:06	01
LH18/24-SP650-6418-GRAB	L17021201-01	T4.022717.165541	02/27/17 16:55	01
LCS	WG604065-03	T4.022817.183539	02/28/17 18:35	02
LH18/24-SP650-6418-GRAB	L17021201-01	T4.022817.183922	02/28/17 18:39	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5176587
 Report generated 03/01/2017 12:27



METHOD BLANK SUMMARY

Login Number: L17021201 Work Group: WG604140
 Blank File ID: T4.022817.183149 Blank Sample ID: WG604065-02
 Prep Date: 02/24/17 09:13 Instrument ID: ICP-THERMO4
 Analyzed Date: 02/28/17 18:31 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG604065-03	T4.022717.160649	02/27/17 16:06	01
LH18/24-SP650-6418-GRAB	L17021201-01	T4.022717.165541	02/27/17 16:55	01
LCS	WG604065-03	T4.022817.183539	02/28/17 18:35	02
LH18/24-SP650-6418-GRAB	L17021201-01	T4.022817.183922	02/28/17 18:39	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5176587
 Report generated 03/01/2017 12:27



Login Number: L17021201 Prep Date: 02/24/17 09:13 Sample ID: WG604065-02
 Instrument ID: ICP-THERMO4 Run Date: 02/27/17 16:02 Prep Method: 3015
 File ID: T4.022717.160259 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG604140 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-27-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Barium, Total	0.00500	0.0100	0.00500	1	U
Selenium, Total	0.0400	0.0800	0.0400	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5176588
 01-MAR-2017 12:04



Login Number: L17021201 Prep Date: 02/24/17 09:13 Sample ID: WG604065-02
 Instrument ID: ICP-THERMO4 Run Date: 02/28/17 18:31 Prep Method: 3015
 File ID: T4.022817.183149 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG604140 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-28-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Selenium, Total	0.0400	0.0800	0.0400	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5176588
 01-MAR-2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604065-03
Instrument ID: ICP-THERMO4 Run Time: 16:06 Prep Method: 3015
File ID: T4.022717.160649 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG604140 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80130 Cal ID: ICP-TH-27-FEB-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Barium, Total	0.625	0.624	99.9	80 - 120	
Selenium, Total	0.250	0.226	90.3	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5176589
Report generated: 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604065-03
Instrument ID: ICP-THERMO4 Run Time: 18:35 Prep Method: 3015
File ID: T4.022817.183539 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG604140 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80130 Cal ID: ICP-TH-28-FEB-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Selenium, Total	0.250	0.237	94.7	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5176589
Report generated: 03/01/2017 12:04



Loginnum: L17021201 Cal ID: ICP-THERMO4- Worknum: WG604140
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG604065-01 File ID: T4.022717.174553 Dil: 1 Matrix: WATER
 Sample ID: WG604065-04 MS File ID: T4.022717.174949 Dil: 1 Units: mg/L
 Sample ID: WG604065-05 MSD File ID: T4.022717.175338 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Barium, Dissolved	3.60	0.625	4.30	112	0.625	4.34	118	0.946	80 - 120	20	
Selenium, Dissolved	ND	0.250	0.203	81.3	0.250	0.210	84.0	3.20	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Loginnum: L17021201 Cal ID: ICP-THERMO4- Worknum: WG604140
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG604065-01 File ID: T4.022817.191000 Dil: 1 Matrix: WATER
 Sample ID: WG604065-04 MS File ID: T4.022817.191354 Dil: 1 Units: mg/L
 Sample ID: WG604065-05 MSD File ID: T4.022817.191744 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Selenium, Dissolved	ND	0.250	0.209	83.5	0.250	0.228	91.1	8.77	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17021201 **Worknum:** WG604140
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG604140-02 **File ID:** T4.022717.163655 **Dil:** 5 **Units:** ug/L
Sample: L17021191-04 **File ID:** T4.022717.162926 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Barium	42.2		43.8		3.67	
Selenium	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 25 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5176584

03/01/2017 12:04



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17021201 **Worknum:** WG604140
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG604140-04 **File ID:** T4.022817.185100 **Dil:** 5 **Units:** ug/L
Sample: L17021203-01 **File ID:** T4.022817.184317 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Barium	287		286		0.46	
Selenium	2.05		ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 25 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5176584

03/01/2017 12:04



Sample Login ID: L17021201 Worknum: WG604140
 Instrument ID: ICP-THERMO4 Method: 6010C
 Post Spike ID: WG604140-01 File ID: T4.022717.163314 Dil: 1 Units: ug/L
 Sample ID: L17021191-04 File ID: T4.022717.162926 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
BARIUM	536		42.2		500	99.6	75 - 125	
SELENIUM	193		0	U	200	96.3	75 - 125	

N = % Recovery exceeds control limits
 F = Result is between MDL and RL
 U = Sample result is below MDL. A value of zero is used in the calculation



Sample Login ID: L17021201 Worknum: WG604140
 Instrument ID: ICP-THERMO4 Method: 6010C
 Post Spike ID: WG604140-03 File ID: T4.022817.184711 Dil: 1 Units: ug/L
 Sample ID: L17021203-01 File ID: T4.022817.184317 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
BARIUM	755		287		500	99.3	75 - 125	
SELENIUM	189		0	U	200	94.3	75 - 125	

N = % Recovery exceeds control limits
 F = Result is between MDL and RL
 U = Sample result is below MDL. A value of zero is used in the calculation



Login: L17021201 Workgroup (AAB#): WG604140
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG604433 Initial Calibration Date: 27-FEB-2017 15:05

	WG604433-01		WG604433-02		WG604433-03		WG604433-04		WG604433-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
BARIUM	0	0.00872	.01	0.0222	.02	0.0332	1	1.50	2	3.05	.999956	
SELENIUM	0	0.000100	NA	NA	.008	0.000200	.4	0.00477	.8	0.00983	.999651	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login: L17021201 Workgroup (AAB#): WG604140
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG604624 Initial Calibration Date: 28-FEB-2017 15:34

	WG604624-01		WG604624-02		WG604624-03		WG604624-04		WG604624-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
BARIUM	0	0.0102	.01	0.0224	.02	0.0354	1	1.51	2	3.04	.999989	
SELENIUM	0	0	NA	NA	.008	0.000100	.4	0.00467	.8	0.00948	.999585	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-07
Instrument ID: ICP-THERMO4 Run Time: 15:12 Method: 6010C
File ID: T4.022717.151241 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG604140 Cal ID: ICP-THERM - 27-FEB-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
BARIIUM	.004	.008	.004	U
SELENIUM	.032	.064	.032	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-07
Instrument ID: ICP-THERMO4 Run Time: 15:42 Method: 6010C
File ID: T4.022817.154202 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG604140 Cal ID: ICP-THERI - 28-FEB-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
BARIIUM	.004	.008	.004	U
SELENIUM	.032	.064	.032	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-14
 Instrument ID: ICP-THERMO4 Run Time: 15:44 Method: 6010C
 File ID: T4.022717.154413 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5176598
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-16
 Instrument ID: ICP-THERMO4 Run Time: 16:44 Method: 6010C
 File ID: T4.022717.164418 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5176598
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-18
 Instrument ID: ICP-THERMO4 Run Time: 17:30 Method: 6010C
 File ID: T4.022717.173008 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5176598
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-39
Instrument ID: ICP-THERMO4 Run Time: 23:38 Method: 6010C
File ID: T4.022717.233854 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5176598
Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-43
 Instrument ID: ICP-THERMO4 Run Time: 23:53 Method: 6010C
 File ID: T4.022717.235352 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5176598
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-14
 Instrument ID: ICP-THERMO4 Run Time: 16:08 Method: 6010C
 File ID: T4.022817.160821 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5176598
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-20
Instrument ID: ICP-THERMO4 Run Time: 18:27 Method: 6010C
File ID: T4.022817.182755 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5176598
Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-22
Instrument ID: ICP-THERMO4 Run Time: 19:06 Method: 6010C
File ID: T4.022817.190608 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.00400	0.00800	0.00400	U
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5176598
Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-06
 Instrument ID: ICP-THERMO4 Run Time: 15:09 Method: 6010C
 File ID: T4.022717.150905 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Barium	1	1.01	101	90 - 110	
Selenium	.4	0.409	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-06
 Instrument ID: ICP-THERMO4 Run Time: 15:37 Method: 6010C
 File ID: T4.022817.153742 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Barium	1	1.00	100	90 - 110	
Selenium	.4	0.408	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-13
 Instrument ID: ICP-THERMO4 Run Time: 15:40 Method: 6010C
 File ID: T4.022717.154039 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.03	mg/L	103	90 - 110	
Selenium	0.400	0.416	mg/L	104	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-15
Instrument ID: ICP-THERMO4 Run Time: 16:40 Method: 6010C
File ID: T4.022717.164045 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.02	mg/L	102	90 - 110	
Selenium	0.400	0.408	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-17
 Instrument ID: ICP-THERMO4 Run Time: 17:26 Method: 6010C
 File ID: T4.022717.172633 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.03	mg/L	103	90 - 110	
Selenium	0.400	0.406	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5176597
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-38
 Instrument ID: ICP-THERMO4 Run Time: 23:35 Method: 6010C
 File ID: T4.022717.233518 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.07	mg/L	107	90 - 110	
Selenium	0.400	0.416	mg/L	104	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-42
 Instrument ID: ICP-THERMO4 Run Time: 23:50 Method: 6010C
 File ID: T4.022717.235016 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.07	mg/L	107	90 - 110	
Selenium	0.400	0.424	mg/L	106	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-13
 Instrument ID: ICP-THERMO4 Run Time: 16:04 Method: 6010C
 File ID: T4.022817.160445 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.01	mg/L	101	90 - 110	
Selenium	0.400	0.400	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5176597
 Report generated 03/01/2017 12:04



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-19
 Instrument ID: ICP-THERMO4 Run Time: 18:24 Method: 6010C
 File ID: T4.022817.182418 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.02	mg/L	102	90 - 110	
Selenium	0.400	0.404	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-21
Instrument ID: ICP-THERMO4 Run Time: 19:02 Method: 6010C
File ID: T4.022817.190232 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	1.00	1.03	mg/L	103	90 - 110	
Selenium	0.400	0.411	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-10
 Instrument ID: ICP-THERMO4 Run Time: 15:24 Method: 6010C
 File ID: T4.022717.152408 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0100	0.00970	mg/L	97.0	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/27/2017 Sample ID: WG604433-29
 Instrument ID: ICP-THERMO4 Run Time: 20:34 Method: 6010C
 File ID: T4.022717.203401 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 27-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0100	0.0109	mg/L	109	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-09
 Instrument ID: ICP-THERMO4 Run Time: 15:49 Method: 6010C
 File ID: T4.022817.154939 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0172	mg/L	107	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17021201 Run Date: 02/28/2017 Sample ID: WG604624-34
 Instrument ID: ICP-THERMO4 Run Time: 22:05 Method: 6010C
 File ID: T4.022817.220511 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG604140 Cal ID: ICP-TH - 28-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0220	mg/L	137	70 - 130	*

* Exceeds LIMITS Criteria



Login number: L17021201
 Instrument ID: ICP-THERMO4
 Sol. A: WG604433-11
 Sol. AB: WG604433-12

File ID: T4.022717.153311
 File ID: T4.022717.153659

Workgroup (AAB#): WG604140
 Method: 6010C
 Units: mg/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Barium	NS	-0.000280	NS	0.250	0.247	98.8	
Selenium	NS	0.0000200	NS	0.250	0.258	103	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17021201
Instrument ID: ICP-THERMO4
Sol. A: WG604624-11
Sol. AB: WG604624-12

File ID: T4.022817.155716
File ID: T4.022817.160103

Workgroup (AAB#): WG604140
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Barium	NS	-0.000420	NS	0.250	0.247	98.8	
Selenium	NS	0.0000100	NS	0.250	0.236	94.4	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000410	0	0	0
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0.0145	0	-0.0000800
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0.000378	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	-0.000289	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0.0000140	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.0000120	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0.0000320	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	308.20	0	0	0	-0.000820	0
ANTIMONY	206.80	0	0	0	0	0.0260
ARSENIC	189.00	0	0	0	0	-0.00730
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0.00343	0
CADMIUM	228.80	0	0	0	-0.00390	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	-0.000200
COPPER	224.70	0	0	0	0.0000770	-0.00100
IRON	261.10	0	0	0	0	-0.00100
LEAD	220.30	0	0	0	-0.0000130	-0.000132
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000500
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	-0.000860	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0.00000500	0	0	0
THALLIUM	190.80	0	0	0	0.00240	0.000276
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	-0.00350
ZINC	206.20	0	0	0	0	-0.00180
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000560	0	0	0
ARSENIC	189.00	0	-0.0000490	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0.000648	0	0	0
CADMIUM	228.80	0	-0.00000500	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000400	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.00139	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0.000609	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000220
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000420	0	0	0
PHOSPHORUS	214.90	0.0390	0.000900	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000118	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000200	0	0	0
VANADIUM	292.40	0	0.0000700	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000910	0	-0.00190	0
ARSENIC	189.00	0	0.000139	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.00190	0	0	0
CADMIUM	228.80	0	0.0000320	0	-0.000770	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0.000360	0	0	0	0
COBALT	228.60	0	-0.00200	0	0.000100	0
COPPER	224.70	0	0.00160	0	-0.0123	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	-0.000610	0	0.000110	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	-0.00290	-0.0230	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0.0000300	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0.00710	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0.000600	0.000580	0	0	0
SILICON	212.40	0	-0.354	0	0	0
SILVER	328.10	0	-0.0000100	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0.00100	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000153	0	0	0
VANADIUM	292.40	-0.000200	-0.00160	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	PB	SB	SE	SI	SN
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0	0	0	-0.0320
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0.00440	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.0720	0
ANTIMONY	206.80	0	0.000500	0	-0.00360	0
ARSENIC	189.00	0	0	0	0.000107	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	-0.00000700	0	0.000990	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0.000102	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000550	0	0	0
COBALT	228.60	0	0.00170	0	0.0000200	0
COPPER	224.70	0	0.000269	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	-0.000126	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	-0.00290	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	-0.000110	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	-0.00100	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000720	0	-0.000260	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.00100	0	-0.0420	0
TIN	189.90	0	-0.00190	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0.000820	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	ZR
ALUMINUM	308.20	0
ANTIMONY	206.80	0
ARSENIC	189.00	0
BARIUM	455.40	0
BERYLLIUM	313.10	0
BORON	249.60	0
CADMIUM	228.80	0
CALCIUM	422.60	0
CHROMIUM	267.70	0
COBALT	228.60	0
COPPER	224.70	0
IRON	261.10	0
LEAD	220.30	0
LITHIUM	670.70	0
MAGNESIUM	279.10	0
MANGANESE	257.60	0
MOLYBDENUM	202.00	0
NICKEL	231.60	0
PHOSPHORUS	214.90	0
POTASSIUM	766.40	0
SELENIUM	196.10	0
SILICON	212.40	0
SILVER	328.10	0
SODIUM	589.50	0
STRONTIUM	407.70	0
THALLIUM	190.80	0
TIN	189.90	0
TITANIUM	337.20	0
VANADIUM	292.40	0
ZINC	206.20	0
ZIRCONIUM	339.10	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5176592
 Report generated: 03/01/2017 12:04



Login Number: L17021201 Date: 01/24/2017
 Instrument ID: ICP-THERMO4 Method: 6010C

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	10.00	900.0
Antimony	20.00	45.0
Arsenic	10.00	45.0
Barium	10.00	45.0
Beryllium	10.00	1.8
Boron	20.00	45.0
Cadmium	20.00	4.5
Calcium	8.00	270.0
Chromium	20.00	36.0
Cobalt	20.00	45.0
Copper	20.00	180.0
Iron	8.00	720.0
Lead	20.00	225.0
Lithium	8.00	36.0
Magnesium	8.00	900.0
Manganese	10.00	36.0
Molybdenum	20.00	27.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	8.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	4.5
Sodium	8.00	270.0
Strontium	8.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	8.00	45.0
Vanadium	20.00	27.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.3.1.3 Raw Data

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000137	0.038944	0.000000	1.000000
Al 308.215 {109}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000949	0.009467	0.000000	1.000000
As 189.042 {478}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000142	0.020462	0.000000	1.000000
B 249.678 {135}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000156	0.012862	0.000000	1.000000
Ba 455.403 {74}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.008720	1.510941	0.000000	1.000000
Be 313.107 {108}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000259	0.727618	0.000000	1.000000
Ca 422.673 {80}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000813	0.031746	0.000000	1.000000
Cd 228.802 {447}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000393	0.406779	0.000000	1.000000
Co 228.616 {44}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000123	0.307816	0.000000	1.000000
Cr 267.716 {126}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000041	0.034955	0.000000	1.000000
Cu 224.700 {450}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000602	0.093209	0.000000	1.000000
Fe 261.187 {129}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000034	0.013610	0.000000	1.000000
K 766.490 {44}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.008381	0.027257	0.000000	1.000000
Li 670.784 {50}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.007109	0.507598	0.000000	1.000000
Mg 279.079 {121}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000077	0.002869	0.000000	1.000000
Mn 257.610 {131}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000617	0.135497	0.000000	1.000000
Mo 202.030 {467}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000117	0.111708	0.000000	1.000000
Na 589.592 {57}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.020119	0.087144	0.000000	1.000000
Ni 231.604 {446}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000740	0.083167	0.000000	1.000000
P 214.914 {457}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000050	0.009901	0.000000	1.000000
Pb 220.353 {453}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000180	0.051028	0.000000	1.000000
Sb 206.833 {463}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000554	0.021728	0.000000	1.000000
Se 196.090 {472}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000101	0.011973	0.000000	1.000000
Si 212.412 {459}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000369	0.027428	0.000000	1.000000
Sn 189.989 {477}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000126	0.060826	0.000000	1.000000
Sr 407.771 {83}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.001248	2.377054	0.000000	1.000000
Tl 337.280 {100}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000500	0.085520	0.000000	1.000000
Tl 190.856 {477}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	-0.000108	0.015672	0.000000	1.000000
V 292.402 {115}	2/27/2017 15:09:01	2/27/2017 15:09:01	Linear	1/Conc	0.000055	0.050480	0.000000	1.000000
Y 224.306 {450}* Y 360.073 {94}* Y 377.433 {89}* Zn 206.200 {463} Zr 339.198 {99}	<not fit> <not fit> <not fit> 2/27/2017 15:09:01 2/27/2017 15:09:01	<Never Calibrated> <Never Calibrated> <Never Calibrated> 2/27/2017 15:09:01 2/27/2017 15:09:01	Linear Linear Linear Linear Linear	1/Conc 1/Conc 1/Conc 1/Conc 1/Conc	0.000000 0.000000 0.000000 0.000504 0.001980	0.000000 0.000000 0.000000 0.405168 0.002128	0.000000 0.000000 0.000000 0.000000 0.000000	1.000000 1.000000 1.000000 1.000000 1.000000

Approved: February 28, 2017

K. K. Beck

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999228	0.000004	0.002058	0.006860	OK.	1.000000	0.000000	1	0
Al 308.215 {109}	0.999899	0.000009	0.006497	0.021656	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.998537	0.000004	0.004903	0.016344	OK.	1.000000	0.000000	1	0
B 249.678 {135}	0.999770	0.000001	0.002969	0.009897	OK.	1.000000	0.000000	1	0
Ba 455.403 {74}	0.999956	0.000090	0.000615	0.002048	OK.	1.000000	0.000000	1	0
Be 313.107 {108}	0.999878	0.000004	0.000075	0.000250	OK.	1.000000	0.000000	1	0
Ca 422.673 {80}	0.999946	0.000021	0.021516	0.071721	OK.	1.000000	0.000000	1	0
Cd 228.802 {447}	0.999165	0.000006	0.000384	0.001279	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	0.999955	0.000004	0.000590	0.001968	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999948	0.000001	0.001344	0.004480	OK.	1.000000	0.000000	1	0
Cu 224.700 {450}	0.999961	0.000003	0.002180	0.007266	OK.	1.000000	0.000000	1	0
Fe 261.187 {129}	0.999946	0.000004	0.015231	0.050771	OK.	1.000000	0.000000	1	0
K 766.490 {44}	0.999958	0.000079	0.071337	0.237789	OK.	1.000000	0.000000	1	0
Li 670.784 {50}	0.999881	0.000077	0.004045	0.013484	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999931	0.000003	0.071951	0.239837	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999854	0.000007	0.001897	0.006325	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999958	0.000007	0.000829	0.002762	OK.	1.000000	0.000000	1	0
Na 589.592 {57}	0.999948	0.000283	0.022823	0.076076	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	0.999653	0.000007	0.002067	0.006890	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999812	0.000012	0.011438	0.038126	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999239	0.000006	0.005164	0.017212	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999010	0.000007	0.007387	0.024624	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999651	0.000001	0.011070	0.036900	OK.	1.000000	0.000000	1	0
Si 212.412 {459}	0.999910	0.000011	0.003972	0.013241	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999955	0.000004	0.001390	0.004633	OK.	1.000000	0.000000	1	0
Sr 407.771 {83}	0.999960	0.000135	0.000293	0.000975	OK.	1.000000	0.000000	1	0
Ti 337.280 {100}	0.999399	0.000019	0.004552	0.015174	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.999927	0.000001	0.007108	0.023694	OK.	1.000000	0.000000	1	0
V 292.402 {115}	0.999939	0.000004	0.001033	0.003442	OK.	1.000000	0.000000	1	0
Y 224.306 {450}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 360.073 {94}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 377.433 {89}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999958	0.000024	0.000277	0.000924	OK.	1.000000	0.000000	1	0
Zr 339.198 {99}	0.582344	0.000019	0.243647	0.812156	OK.	1.000000	0.000000	1	0

Approved: February 28, 2017

K: K Beck

Sample Name: S0 Acquired: 2/27/2017 14:50:29 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00014	.00095	.00014	.00016	.00872	.00026	.00081
Stddev	.00006	.00002	.00002	.00001	.00056	.00005	.00079
%RSD	45.360	1.5842	12.302	6.7160	6.4021	19.919	96.582

#1	-.00014	.00096	.00016	.00017	.00831	.00031	.00075
#2	-.00020	.00093	.00013	.00015	.00849	.00021	.00006
#3	-.00007	.00095	.00014	.00015	.00936	.00026	.00163

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00039	.00012	.00004	-.00060	-.00003	.00838	-.00711
Stddev	.00007	.00001	.00002	.00018	.00007	.00057	.00048
%RSD	17.147	9.7064	54.417	29.467	199.31	6.7826	6.7849

#1	.00032	.00011	.00002	-.00046	-.00008	.00794	-.00669
#2	.00041	.00013	.00005	-.00055	-.00004	.00818	-.00764
#3	.00045	.00013	.00005	-.00080	-.00006	.00902	-.00701

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00008	.00062	.00012	-.02013	-.00074	-.00005	.00018
Stddev	.00014	.00022	.00001	.00156	.00006	.00003	.00004
%RSD	182.89	35.032	11.357	7.7597	7.9146	61.842	22.594

#1	.00008	.00039	.00010	-.01850	-.00069	-.00008	.00017
#2	-.00018	.00081	.00013	-.02028	-.00081	-.00002	.00023
#3	-.00014	.00065	.00012	-.02161	-.00072	-.00004	.00015

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00055	.00010	.00037	.00013	.00125	-.00050	-.00011
Stddev	.00012	.00017	.00003	.00005	.00064	.00011	.00004
%RSD	20.767	166.75	9.0672	38.013	51.668	22.592	40.269

#1	.00050	.00025	.00039	.00016	.00063	-.00037	-.00009
#2	.00069	-.00008	.00033	.00015	.00120	-.00054	-.00016
#3	.00048	.00014	.00038	.00007	.00192	-.00058	-.00008

Approved: February 28, 2017

K. K. Beck

Sample Name: S0 Acquired: 2/27/2017 14:50:29 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.00005	.00050	-.00198
Stddev	.00001	.00004	.00019
%RSD	23.474	8.3871	9.4413

#1	.00007	.00055	-.00177
#2	.00006	.00048	-.00214
#3	.00004	.00048	-.00203

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5406.6	74226.	9561.4
Stddev	41.2	191.	30.3
%RSD	.76119	.25682	.31719

#1	5450.3	74346.	9569.4
#2	5400.7	74006.	9586.9
#3	5368.7	74326.	9527.9

Approved: February 28, 2017

Ki K Buck

Sample Name: S1 Acquired: 2/27/2017 14:54:19 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	Ba4554	Be3131	Ca4226	Cd2288	Co2286
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00007	.00182	.02219	.00050	.00299	.00045	.00068
Stddev	.00003	.00000	.00036	.00004	.00075	.00004	.00014
%RSD	45.018	.27057	1.6161	7.9396	24.965	9.5870	20.253

#1	-.00010	.00183	.02222	.00047	.00373	.00047	.00074
#2	-.00007	.00182	.02182	.00048	.00223	.00040	.00052
#3	-.00004	.00182	.02254	.00055	.00302	.00048	.00078

Elem	Cr2677	Cu2247	Fe2611	K_7664	Mn2576	Mo2020	Na5895
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00018	-.00021	.00043	.02016	.00100	.00105	.01914
Stddev	.00005	.00008	.00038	.00153	.00030	.00005	.00232
%RSD	25.775	38.771	88.384	7.5654	30.020	5.1836	12.118

#1	.00017	-.00030	.00057	.02056	.00071	.00103	.01649
#2	.00023	-.00019	.00072	.01848	.00099	.00111	.02080
#3	.00014	-.00014	-.00000	.02145	.00131	.00101	.02013

Elem	Ni2316	P_2149	Pb2203	Sb2068	Si2124	Sn1899	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00038	.00077	.00041	.00060	.00143	.00066	.02110
Stddev	.00002	.00008	.00029	.00009	.00012	.00008	.00024
%RSD	5.6769	9.9885	71.901	14.355	8.2752	12.665	1.1179

#1	-.00037	.00078	.00040	.00059	.00133	.00069	.02104
#2	-.00040	.00085	.00070	.00069	.00141	.00057	.02089
#3	-.00036	.00070	.00012	.00051	.00156	.00073	.02135

Elem	Ti3372	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00022	.00046	.00383	-.00181
Stddev	.00051	.00006	.00006	.00008
%RSD	227.55	13.992	1.5705	4.6275

#1	.00028	.00039	.00378	-.00175
#2	-.00021	.00051	.00383	-.00177
#3	-.00074	.00048	.00390	-.00190

Approved: February 28, 2017

K. K. Beck

Sample Name: S1 Acquired: 2/27/2017 14:54:19 Type: Cal
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5326.5	73958.	9503.2
Stddev	39.9	398.	63.7
%RSD	.74947	.53879	.67000
#1	5301.4	74389.	9472.6
#2	5372.5	73880.	9460.6
#3	5305.6	73604.	9576.4

Approved: February 28, 2017

Ki K Buck

Sample Name: S2 Acquired: 2/27/2017 14:58:09 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00001	.00271	.00018	.00028	.03320	.00080	.00561
Stddev	.00003	.00003	.00006	.00006	.00020	.00001	.00072
%RSD	276.04	.98619	35.832	21.958	.61697	1.7360	12.781

#1	-.00002	.00270	.00013	.00034	.03325	.00080	.00506
#2	.00005	.00269	.00025	.00022	.03338	.00079	.00642
#3	.00000	.00274	.00016	.00027	.03298	.00082	.00535

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00088	.00115	.00032	.00019	.00090	.03053	.00264
Stddev	.00007	.00009	.00003	.00017	.00013	.00316	.00203
%RSD	7.7534	8.0689	9.1030	87.392	14.470	10.336	76.653

#1	.00081	.00126	.00032	.00001	.00076	.03367	.00467
#2	.00088	.00111	.00029	.00033	.00092	.03057	.00265
#3	.00094	.00109	.00034	.00023	.00102	.02736	.00061

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00045	.00178	.00185	.05551	.00016	.00149	.00038
Stddev	.00018	.00047	.00005	.00064	.00009	.00003	.00004
%RSD	38.907	26.350	2.4935	1.1548	56.568	2.2060	11.599

#1	.00026	.00169	.00190	.05614	.00011	.00146	.00033
#2	.00061	.00136	.00185	.05553	.00026	.00149	.00041
#3	.00049	.00229	.00181	.05485	.00010	.00153	.00039

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00088	.00020	.00226	.00115	.04045	.00065	-.00001
Stddev	.00010	.00006	.00002	.00003	.00023	.00022	.00005
%RSD	11.833	28.257	.90625	2.8598	.57518	33.962	531.40

#1	.00088	.00024	.00226	.00117	.04034	.00090	.00004
#2	.00077	.00021	.00228	.00112	.04029	.00059	-.00001
#3	.00098	.00014	.00224	.00117	.04071	.00047	-.00006

Approved: February 28, 2017

K. K. Beck

Sample Name: S2 Acquired: 2/27/2017 14:58:09 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.00085	.00705	-.00134
Stddev	.00001	.00005	.00033
%RSD	1.2247	.71605	24.630

#1	.00084	.00700	-.00168
#2	.00086	.00703	-.00102
#3	.00085	.00710	-.00131

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5336.0	73099.	9406.3
Stddev	9.7	494.	67.7
%RSD	.18230	.67513	.71928

#1	5340.7	73540.	9434.3
#2	5324.8	73190.	9455.5
#3	5342.4	72566.	9329.1

Approved: February 28, 2017

Ki K Buck

Sample Name: S3 Acquired: 2/27/2017 15:01:59 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01520	.09707	.00811	.00642	1.5036	.03684	.31569	.02230
Stddev	.00008	.00061	.00004	.00004	.0058	.00012	.00050	.00007
%RSD	.49891	.63291	.44994	.60031	.38555	.31817	.15715	.31353

#1	.01516	.09707	.00815	.00642	1.5021	.03685	.31513	.02235
#2	.01529	.09646	.00808	.00638	1.4986	.03671	.31587	.02222
#3	.01515	.09768	.00810	.00645	1.5100	.03694	.31607	.02232

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.06109	.01728	.04575	.05373	1.3553	.49650	.02843	.06780
Stddev	.00022	.00011	.00009	.00038	.0045	.00180	.00023	.00019
%RSD	.36757	.64348	.18807	.70805	.33345	.36259	.80520	.27960

#1	.06124	.01732	.04584	.05330	1.3584	.49824	.02832	.06793
#2	.06119	.01716	.04567	.05389	1.3501	.49464	.02828	.06758
#3	.06083	.01737	.04574	.05401	1.3574	.49663	.02869	.06790

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.11045	4.3036	.04044	.09652	.02572	.02588	.00477	.12563
Stddev	.00043	.0205	.00018	.00038	.00026	.00006	.00020	.00038
%RSD	.38912	.47625	.43312	.39772	1.0202	.22729	4.2178	.30022

#1	.11093	4.3084	.04063	.09695	.02598	.02582	.00454	.12601
#2	.11032	4.2811	.04039	.09620	.02573	.02592	.00491	.12526
#3	.11010	4.3212	.04029	.09642	.02545	.02592	.00485	.12563

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.06022	2.3495	.08380	.00714	.04964	.40018	.00005
Stddev	.00011	.0058	.00009	.00007	.00021	.00114	.00035
%RSD	.17776	.24796	.11174	1.0414	.42983	.28480	767.76

#1	.06026	2.3452	.08373	.00715	.04962	.40149	.00022
#2	.06030	2.3472	.08375	.00706	.04943	.39942	-.00036
#3	.06010	2.3561	.08390	.00721	.04986	.39962	.00028

Approved: February 28, 2017

K. K. Beck

Sample Name: S3 Acquired: 2/27/2017 15:01:59 Type: Cal
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5271.0	71826.	9449.3
Stddev	14.0	665.	25.9
%RSD	.26649	.92607	.27421
#1	5256.2	72040.	9477.2
#2	5272.5	72358.	9444.8
#3	5284.2	71080.	9426.0

Approved: February 28, 2017

K. K. Beck

Sample Name: S4 Acquired: 2/27/2017 15:05:35 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.03125	.19101	.01667	.01309	3.0450	.07508	.63896	.04515
Stddev	.00008	.00072	.00004	.00006	.0100	.00020	.00272	.00003
%RSD	.24579	.37559	.25617	.48371	.32708	.26725	.42604	.07009

#1	.03129	.19032	.01663	.01315	3.0533	.07490	.63947	.04518
#2	.03116	.19097	.01666	.01309	3.0339	.07503	.63601	.04516
#3	.03131	.19175	.01671	.01302	3.0478	.07530	.64138	.04512

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.12343	.03528	.09357	.10941	2.7488	1.0104	.05719	.13678
Stddev	.00016	.00005	.00005	.00061	.0198	.0023	.00038	.00110
%RSD	.12679	.15023	.05059	.55448	.72163	.22839	.66087	.80691

#1	.12347	.03523	.09358	.11011	2.7706	1.0084	.05704	.13702
#2	.12357	.03527	.09352	.10912	2.7319	1.0100	.05691	.13557
#3	.12326	.03533	.09361	.10901	2.7437	1.0129	.05762	.13774

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.22488	8.7175	.08257	.20120	.05187	.05229	.00983	.25749
Stddev	.00040	.0620	.00019	.00037	.00017	.00010	.00011	.00012
%RSD	.17721	.71070	.22414	.18606	.32376	.18570	1.0783	.04523

#1	.22468	8.7890	.08236	.20093	.05203	.05218	.00972	.25742
#2	.22462	8.6784	.08270	.20104	.05189	.05233	.00993	.25763
#3	.22534	8.6852	.08265	.20163	.05170	.05236	.00984	.25743

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.12206	4.7825	.17214	.01419	.10157	.81548	.00161
Stddev	.00022	.0179	.00219	.00013	.00018	.00257	.00009
%RSD	.17869	.37345	1.2728	.90102	.17464	.31575	5.8026

#1	.12192	4.7991	.17461	.01425	.10137	.81413	.00156
#2	.12195	4.7636	.17140	.01428	.10168	.81386	.00155
#3	.12231	4.7849	.17042	.01405	.10167	.81845	.00172

Approved: February 28, 2017

Ki K Buck

Sample Name: S4 Acquired: 2/27/2017 15:05:35 Type: Cal
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: IR Corr. Factor: 1.000000
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5263.1	71536.	9583.7
Stddev	15.4	72.	24.1
%RSD	.29234	.10032	.25185
#1	5266.0	71526.	9566.0
#2	5276.9	71612.	9611.2
#3	5246.5	71470.	9573.9

Approved: February 28, 2017

Ki K Buck

Sample Name: ICV Acquired: 2/27/2017 15:09:05 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40709	10.145	.41245	.50283	1.0094	.05080	10.217
Stddev	.00078	.030	.00370	.00084	.0036	.00010	.084
%RSD	.19210	.29209	.89672	.16645	.35847	.20492	.82547

#1	.40791	10.177	.41407	.50203	1.0097	.05082	10.253
#2	.40701	10.138	.40821	.50370	1.0128	.05069	10.277
#3	.40636	10.119	.41506	.50277	1.0056	.05089	10.120

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05086	.20274	.50008	.50545	4.0565	50.427	1.0082
Stddev	.00034	.00060	.00234	.00165	.0101	.237	.0054
%RSD	.67776	.29477	.46863	.32592	.24946	.46958	.53773

#1	.05073	.20287	.50077	.50576	4.0650	50.372	1.0138
#2	.05125	.20326	.49747	.50691	4.0591	50.686	1.0079
#3	.05059	.20209	.50199	.50366	4.0453	50.222	1.0029

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.122	.50952	F .94698	50.221	.50417	10.090	.51354
Stddev	.104	.00185	.00194	.207	.00067	.010	.00261
%RSD	1.0313	.36387	.20512	.41216	.13267	.10160	.50792

#1	10.006	.50738	.94818	50.193	.50465	10.096	.51431
#2	10.210	.51075	.94802	50.441	.50445	10.079	.51064
#3	10.149	.51041	.94474	50.030	.50341	10.097	.51568

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			1.0000				
Range			-5.0000%				

Approved: February 28, 2017

Ki K Buck

Sample Name: ICV Acquired: 2/27/2017 15:09:05 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2295	.40909	4.9631	1.0173	1.0111	1.0023	.50535
Stddev	.0134	.00405	.0053	.0065	.0055	.0080	.00569
%RSD	1.0896	.99011	.10774	.63799	.54069	.79322	1.1265

#1	1.2405	.40645	4.9674	1.0164	1.0127	1.0024	.50885
#2	1.2146	.41376	4.9647	1.0114	1.0156	1.0102	.49878
#3	1.2333	.40707	4.9571	1.0242	1.0050	.99426	.50843

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.99408	1.0132	F .58641
Stddev	.00140	.0021	.14413
%RSD	.14097	.20761	24.578

#1	.99327	1.0146	.46032
#2	.99328	1.0108	.74352
#3	.99570	1.0142	.55538

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-5.0000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5309.0	72300.	9531.6
Stddev	8.0	324.	39.1
%RSD	.14999	.44818	.41004

#1	5310.7	72292.	9536.5
#2	5315.9	72627.	9490.4
#3	5300.3	71979.	9568.1

Approved: February 28, 2017

Ki K Buck

Sample Name: ICB Acquired: 2/27/2017 15:12:41 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0186	-0.0210	-0.0357	.00390	.00021	-0.0005	-0.1643
Stddev	.00124	.00421	.00328	.00209	.00011	.00004	.00809
%RSD	66.782	199.79	91.650	53.426	51.161	84.562	49.261

#1	-0.0320	.00265	-0.0156	.00496	.00027	-0.0001	-.02063
#2	-0.0074	-0.0361	-0.0735	.00150	.00009	-0.0009	-.00710
#3	-0.0165	-0.0535	-0.0181	.00524	.00028	-0.0004	-.02156

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00002	-0.0001	.00000	-0.0097	-0.0414	.11348	.00171
Stddev	.00035	.00016	.00056	.00107	.00755	.05130	.00326
%RSD	1838.4	2415.0	12708.	109.26	182.23	45.212	191.11

#1	.00028	-0.0014	.00065	-0.0009	.00344	.07050	.00458
#2	.00015	-0.0005	-0.0027	-0.0068	-0.0421	.09966	.00238
#3	-0.0038	.00017	-0.0037	-0.0216	-0.1165	.17027	-.00184

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.3853	.00247	.00006	.05486	.00209	.00224	-0.0440
Stddev	.04233	.00270	.00032	.01529	.00038	.00562	.00590
%RSD	109.85	109.50	508.17	27.865	17.959	251.27	134.02

#1	-0.08722	.00485	-0.0002	.06830	.00182	.00654	.00241
#2	-0.01788	.00303	.00041	.03823	.00194	.00429	-.00763
#3	-0.01049	-0.0047	-0.0020	.05804	.00252	-0.00412	-.00799

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: ICB Acquired: 2/27/2017 15:12:41 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00597	-0.00728	-0.00215	-0.00039	.00021	-0.00090	-0.00498
Stddev	.00497	.01583	.00276	.00006	.00032	.00217	.00814
%RSD	83.240	217.52	128.63	15.580	155.24	240.10	163.38

#1	-0.00769	-0.00693	.00059	-0.00046	.00049	.00079	-0.00594
#2	-0.00037	-0.02328	-0.00210	-0.00035	.00028	-0.00015	-0.01260
#3	-0.00983	.00838	-0.00494	-0.00036	-0.00014	-0.00334	.00359

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00099	.00039	F .25568
Stddev	.00051	.00002	.05662
%RSD	51.663	3.9343	22.145

#1	.00112	.00041	.23194
#2	.00043	.00040	.32030
#3	.00144	.00038	.21479

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5370.2	73386.	9432.3
Stddev	10.8	1019.	121.4
%RSD	.20134	1.3880	1.2874

#1	5363.7	72250.	9568.4
#2	5382.7	74219.	9335.0
#3	5364.2	73687.	9393.6

Approved: February 28, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/27/2017 15:16:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00711	.18109	.00413	.07854	.00860	.00154	.40456	.00093
Stddev	.00037	.00152	.00026	.00516	.00055	.00004	.01616	.00011
%RSD	5.2324	.83981	6.1945	6.5661	6.3390	2.9187	3.9948	12.232

#1	.00710	.18170	.00398	.08204	.00804	.00149	.38834	.00106
#2	.00674	.18220	.00442	.07262	.00912	.00157	.40468	.00086
#3	.00749	.17935	.00398	.08096	.00866	.00156	.42066	.00087

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00481	.00373	.00471	.08560	.90184	.08451	.32634	.00795
Stddev	.00063	.00004	.00038	.00985	.06564	.00220	.07585	.00193
%RSD	13.065	1.0283	8.1026	11.510	7.2787	2.5994	23.241	24.229

#1	.00512	.00372	.00496	.08071	.94334	.08231	.37609	.00750
#2	.00522	.00377	.00427	.07914	.82616	.08670	.23904	.00628
#3	.00408	.00370	.00491	.09694	.93602	.08452	.36388	.01006

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00714	.48812	.01851	.81359	.00350	.07929	.00730	.74380
Stddev	.00065	.02361	.00216	.01657	.00297	.00675	.00581	.00770
%RSD	9.0840	4.8362	11.663	2.0366	84.951	8.5160	79.656	1.0349

#1	.00727	.51515	.02100	.82931	.00072	.07226	.00765	.75002
#2	.00644	.47156	.01739	.79628	.00663	.08573	.01292	.73519
#3	.00772	.47764	.01714	.81518	.00315	.07989	.00131	.74620

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/27/2017 15:16:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41877	.04196	.01969	.17074	.00765	.01775	28.061
Stddev	.00101	.00009	.00063	.00626	.00035	.00022	.184
%RSD	.24222	.22205	3.2044	3.6669	4.5095	1.2231	.65473
#1	.41792	.04188	.01959	.16928	.00793	.01772	27.849
#2	.41989	.04194	.02037	.17760	.00727	.01754	28.180
#3	.41848	.04206	.01912	.16534	.00776	.01797	28.153

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5372.0	74495.	9556.9
Stddev	16.6	131.	59.5
%RSD	.30921	.17620	.62297
#1	5386.7	74344.	9619.5
#2	5375.3	74566.	9501.0
#3	5354.0	74576.	9550.2

Approved: February 28, 2017

K. K. Beck

Sample Name: LLICV Acquired: 2/27/2017 15:20:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00558	.17773	.00598	.07872	.00785	.00152	.40159	.00072
Stddev	.00050	.00237	.00417	.00289	.00023	.00004	.00254	.00004
%RSD	8.9630	1.3332	69.766	3.6653	2.9633	2.4852	.63363	6.1424

#1	.00562	.18045	.00973	.07581	.00799	.00152	.39923	.00067
#2	.00606	.17667	.00149	.07876	.00798	.00156	.40124	.00076
#3	.00506	.17608	.00673	.08158	.00758	.00148	.40428	.00073

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00402	.00379	.00463	.08274	.88314	.08548	.40348	.00842
Stddev	.00041	.00079	.00237	.01415	.04378	.00378	.07927	.00214
%RSD	10.233	20.965	51.285	17.101	4.9573	4.4195	19.646	25.400

#1	.00418	.00291	.00734	.06751	.86519	.08502	.48776	.00642
#2	.00356	.00399	.00291	.09547	.93304	.08947	.33042	.01068
#3	.00433	.00446	.00363	.08524	.85119	.08195	.39227	.00816

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00741	.46874	.01855	.80507	.00445	.07645	.00711	.74189
Stddev	.00064	.01290	.00100	.01416	.00421	.00093	.00738	.00273
%RSD	8.6870	2.7514	5.3957	1.7592	94.657	1.2144	103.84	.36793

#1	.00733	.47984	.01966	.81364	.00594	.07552	-.00104	.74040
#2	.00681	.47178	.01828	.78872	.00772	.07738	.00901	.74024
#3	.00809	.45459	.01772	.81284	-.00030	.07644	.01335	.74504

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K: K Beck

Sample Name: LLICV Acquired: 2/27/2017 15:20:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41395	.04180	.02285	.16797	.00718	.03746	27.709
Stddev	.00189	.00007	.00169	.00483	.00039	.00020	.158
%RSD	.45672	.17830	7.4149	2.8760	5.4796	.53355	.57136
#1	.41504	.04172	.02093	.16317	.00764	.03756	27.693
#2	.41177	.04184	.02413	.16791	.00693	.03723	27.559
#3	.41504	.04185	.02350	.17283	.00698	.03759	27.875

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5496.2	75787.	9763.8
Stddev	22.7	241.	51.3
%RSD	.41295	.31858	.52561
#1	5512.8	75830.	9761.9
#2	5505.5	75527.	9713.4
#3	5470.4	76004.	9816.0

Approved: February 28, 2017

K. K. Beck

Sample Name: LLICV Acquired: 2/27/2017 15:24:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00888	.22457	.00921	.09929	.00970	.00194	.51139	.00133
Stddev	.00106	.00681	.00505	.00216	.00090	.00010	.00674	.00026
%RSD	11.987	3.0335	54.800	2.1798	9.2770	5.0967	1.3188	19.700

#1	.00767	.22635	.01502	.10169	.01072	.00183	.51287	.00103
#2	.00966	.23031	.00668	.09872	.00903	.00197	.50403	.00141
#3	.00931	.21704	.00593	.09747	.00934	.00202	.51728	.00154

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00535	.00446	.00587	.10470	1.0803	.10509	.57706	.01190
Stddev	.00033	.00054	.00126	.01032	.0467	.00095	.03349	.00018
%RSD	6.0819	12.168	21.501	9.8522	4.3220	.90424	5.8028	1.5496

#1	.00571	.00409	.00732	.11037	1.0956	.10458	.53948	.01207
#2	.00526	.00508	.00501	.09280	1.0279	.10619	.58796	.01170
#3	.00507	.00421	.00528	.11095	1.1174	.10451	.60374	.01192

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00946	.55010	.02250	1.0223	.00775	.09097	.01321	.93510
Stddev	.00095	.03194	.00144	.0014	.00212	.00558	.00228	.00242
%RSD	10.071	5.8069	6.3965	.13544	27.297	6.1289	17.286	.25876

#1	.00988	.54571	.02175	1.0214	.00980	.09042	.01344	.93242
#2	.00837	.58401	.02415	1.0239	.00558	.09680	.01083	.93712
#3	.01014	.52058	.02158	1.0216	.00788	.08569	.01538	.93576

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/27/2017 15:24:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52398	.05220	.02571	.21023	.00970	.02185	34.889
Stddev	.00102	.00034	.00476	.00401	.00061	.00014	.524
%RSD	.19531	.65264	18.518	1.9072	6.3094	.63099	1.5031
#1	.52346	.05253	.03006	.21304	.00950	.02196	35.256
#2	.52333	.05223	.02062	.21201	.00921	.02169	34.288
#3	.52516	.05185	.02646	.20564	.01039	.02189	35.124

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5438.3	75335.	9632.7
Stddev	40.6	113.	105.9
%RSD	.74620	.15042	1.0994
#1	5448.1	75276.	9534.4
#2	5473.0	75263.	9744.9
#3	5393.7	75465.	9618.9

Approved: February 28, 2017

K. K. Beck

Sample Name: ICSA Acquired: 2/27/2017 15:33:11 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00230	250.96	-.00230	.01224	-.00028	-.00004	234.44
Stddev	.00253	.36	.00248	.00275	.00034	.00001	.81
%RSD	109.99	.14384	107.79	22.496	118.49	17.364	.34450

#1	-.00055	250.59	-.00504	.01423	-.00001	-.00003	233.51
#2	.00317	251.31	-.00022	.00910	-.00066	-.00004	234.98
#3	.00429	250.99	-.00163	.01338	-.00018	-.00004	234.82

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00075	-.00095	-.00210	-.00018	99.329	.10416	.00880
Stddev	.00010	.00039	.00113	.00086	.374	.05677	.00136
%RSD	13.477	40.437	53.889	469.94	.37685	54.508	15.433

#1	.00077	-.00135	-.00309	-.00104	98.934	.16944	.00745
#2	.00064	-.00058	-.00233	-.00021	99.373	.06633	.00879
#3	.00084	-.00093	-.00087	.00069	99.679	.07670	.01017

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	255.04	.00060	-.00060	.07848	-.00140	.05142	.00056
Stddev	.31	.00118	.00028	.01219	.00196	.01741	.00570
%RSD	.12223	196.34	46.186	15.530	140.09	33.858	1022.4

#1	254.69	-.00069	-.00085	.06710	.00085	.03977	-.00263
#2	255.16	.00162	-.00030	.09134	-.00274	.07144	-.00283
#3	255.28	.00088	-.00065	.07700	-.00231	.04306	.00713

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: ICSA Acquired: 2/27/2017 15:33:11 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00541	.00002	.00889	.00022	.00143	-0.00531	-0.00752
Stddev	.01024	.00798	.00352	.00130	.00021	.00225	.00287
%RSD	189.30	49655.	39.636	602.39	14.790	42.358	38.124

#1	.00017	.00262	.00893	.00105	.00120	-.00274	-.00550
#2	-.01722	.00637	.00535	-.00129	.00148	-.00690	-.01080
#3	.00082	-.00894	.01240	.00088	.00161	-.00631	-.00626

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00102	-0.00671	F -2.9926
Stddev	.00093	.00035	.1837
%RSD	91.075	5.1822	6.1373

#1	-.00017	-.00676	-3.0248
#2	-.00088	-.00703	-2.7950
#3	-.00202	-.00634	-3.1581

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02000
Low Limit			-.02000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5023.8	67713.	9338.7
Stddev	6.2	85.	32.9
%RSD	.12385	.12483	.35222

#1	5020.6	67627.	9304.8
#2	5019.8	67718.	9340.8
#3	5030.9	67796.	9370.5

Approved: February 28, 2017

Ki K Buck

Sample Name: ICSAB Acquired: 2/27/2017 15:36:59 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52517	248.94	.24083	.51495	.24700	.25624	227.56
Stddev	.00377	.80	.00720	.00388	.00061	.00009	.69
%RSD	.71838	.32159	2.9913	.75278	.24885	.03435	.30534

#1	.52339	249.26	.23689	.51469	.24760	.25629	227.50
#2	.52261	249.53	.23645	.51121	.24637	.25614	226.89
#3	.52950	248.03	.24914	.51895	.24702	.25629	228.28

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.45329	.23861	.24387	.24786	97.450	5.2920	.01014
Stddev	.00044	.00070	.00021	.00109	.515	.0493	.00270
%RSD	.09645	.29256	.08597	.43800	.52847	.93158	26.593

#1	.45279	.23941	.24388	.24688	97.360	5.2577	.00882
#2	.45361	.23832	.24366	.24903	96.986	5.2699	.01325
#3	.45346	.23810	.24408	.24768	98.004	5.3485	.00836

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	251.29	.24304	-.00067	5.1860	.47805	-.03525	.48059
Stddev	.54	.00153	.00072	.0304	.00121	.01006	.00468
%RSD	.21551	.63102	108.44	.58639	.25320	28.542	.97427

#1	250.95	.24473	-.00087	5.1856	.47781	-.02376	.47638
#2	251.00	.24175	.00014	5.1559	.47698	-.04250	.47977
#3	251.91	.24263	-.00127	5.2167	.47936	-.03949	.48563

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: ICSAB Acquired: 2/27/2017 15:36:59 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48432	.25754	.00465	.48753	.00142	-.00523	.44884
Stddev	.01506	.01098	.00294	.00148	.00009	.00374	.00581
%RSD	3.1104	4.2646	63.275	.30284	6.1191	71.555	1.2941

#1	.46696	.26114	.00726	.48679	.00150	-.00856	.45523
#2	.49396	.26627	.00146	.48658	.00143	-.00593	.44389
#3	.49204	.24521	.00522	.48923	.00133	-.00118	.44739

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.24953	.47434	F -2.6934
Stddev	.00045	.00034	.1762
%RSD	.18105	.07244	6.5416

#1	.24998	.47405	-2.8188
#2	.24907	.47472	-2.4920
#3	.24953	.47425	-2.7695

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02500
Low Limit			-.02500

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4995.0	66765.	9450.2
Stddev	44.4	211.	95.8
%RSD	.88829	.31577	1.0137

#1	5010.5	66996.	9545.8
#2	4945.0	66716.	9450.5
#3	5029.6	66583.	9354.2

Approved: February 28, 2017

K. K. Beck

Sample Name: CCV Acquired: 2/27/2017 15:40:39 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41199	10.531	.41486	.51745	1.0258	.05109	10.242	.05147
Stddev	.00191	.038	.00389	.00171	.0025	.00018	.032	.00033
%RSD	.46414	.36214	.93700	.33036	.24774	.34337	.31364	.63909

#1	.41419	10.569	.41684	.51929	1.0238	.05129	10.236	.05119
#2	.41074	10.493	.41736	.51590	1.0250	.05095	10.213	.05183
#3	.41104	10.532	.41038	.51717	1.0286	.05103	10.276	.05140

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20605	.51489	.51752	4.1328	50.984	1.0174	10.313	.51465
Stddev	.00128	.00267	.00058	.0197	.124	.0028	.111	.00105
%RSD	.62132	.51822	.11185	.47765	.24287	.27348	1.0794	.20390

#1	.20480	.51793	.51686	4.1173	50.881	1.0149	10.370	.51371
#2	.20736	.51298	.51794	4.1262	50.950	1.0204	10.384	.51578
#3	.20598	.51374	.51775	4.1550	51.122	1.0167	10.185	.51444

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0214	50.841	.51871	10.267	.52016	1.2382	.41576	5.1132
Stddev	.0033	.141	.00227	.043	.00216	.0010	.00765	.0118
%RSD	.32376	.27765	.43842	.41688	.41584	.07958	1.8412	.23056

#1	1.0193	50.678	.51613	10.303	.52123	1.2379	.41336	5.1266
#2	1.0252	50.916	.52042	10.280	.51767	1.2394	.42432	5.1086
#3	1.0198	50.929	.51958	10.220	.52158	1.2375	.40958	5.1044

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 15:40:39 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0351	1.0252	1.0202	.52682	1.0241	1.0358	1.0511
Stddev	.0033	.0022	.0042	.00655	.0053	.0027	.1745
%RSD	.32125	.21846	.41319	1.2428	.51789	.26534	16.601

#1	1.0386	1.0236	1.0241	.52153	1.0297	1.0388	1.0860
#2	1.0348	1.0243	1.0209	.52478	1.0192	1.0354	.86183
#3	1.0319	1.0278	1.0157	.53414	1.0236	1.0333	1.2056

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5219.6	71094.	9471.6
Stddev	6.5	107.	110.3
%RSD	.12468	.14994	1.1645

#1	5226.8	71122.	9597.5
#2	5217.6	71184.	9425.0
#3	5214.3	70976.	9392.3

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 15:44:13 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00070	.01115	-.00378	.00065	-.00050	-.00005	-.00730
Stddev	.00048	.01686	.00275	.00216	.00048	.00006	.02150
%RSD	68.398	151.24	72.811	333.52	96.427	112.26	294.33

#1	-.00109	.00042	-.00539	.00263	.00001	-.00012	-.01519
#2	-.00084	.03057	-.00060	-.00165	-.00096	-.00005	.01702
#3	-.00017	.00244	-.00536	.00096	-.00055	.00001	-.02374

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00020	.00040	.00067	.00028	-.00029	.07432	-.00010
Stddev	.00030	.00032	.00100	.00203	.01252	.09055	.00226
%RSD	148.65	79.410	149.80	725.51	4342.0	121.83	2157.8

#1	.00020	.00041	-.00048	-.00172	-.01320	.11658	-.00245
#2	.00050	.00071	.00117	.00234	.01180	.13601	.00205
#3	-.00009	.00008	.00132	.00022	.00053	-.02963	.00008

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.02023	-.00034	-.00092	.04873	.00016	-.00065	F -.00694
Stddev	.05122	.00069	.00060	.01885	.00081	.00422	.00265
%RSD	253.17	202.31	65.562	38.690	514.08	646.75	38.087

#1	-.01666	-.00114	-.00047	.04062	.00011	.00125	-.00953
#2	.02911	.00011	-.00161	.07027	-.00063	.00229	-.00424
#3	-.07315	.00000	-.00068	.03529	.00099	-.00549	-.00706

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							.00500
Low Limit							-.00500

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 15:44:13 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.01046	-0.01483	-0.00315	-0.00136	.00026	-0.00622	-0.00141
Stddev	.00645	.00751	.00295	.00025	.00021	.00461	.00157
%RSD	61.653	50.593	93.805	18.643	79.345	74.111	111.22

#1	-0.00304	-0.01640	-0.00094	-0.00111	.00006	-0.00092	-0.00283
#2	-0.01360	-0.00667	-0.00650	-0.00134	.00025	-0.00843	-0.00169
#3	-0.01474	-0.02144	-0.00201	-0.00162	.00047	-0.00932	.00028

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00028	-0.00070	F .31808
Stddev	.00032	.00013	.10358
%RSD	114.59	18.500	32.565

#1	.00036	-0.00080	.41483
#2	-0.00007	-0.00055	.20880
#3	.00056	-0.00074	.33059

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5239.4	72066.	9268.3
Stddev	11.1	219.	143.6
%RSD	.21174	.30367	1.5490

#1	5228.7	72231.	9341.0
#2	5238.6	71817.	9360.9
#3	5250.9	72149.	9102.9

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW A3 Acquired: 2/27/2017 16:02:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00172	-0.00345	-0.00550	-0.00070	.00011	-0.00006	-0.01719	.00008
Stddev	.00069	.00144	.00156	.00153	.00026	.00004	.02703	.00022
%RSD	40.170	41.705	28.351	218.59	242.42	62.856	157.27	265.27

#1	-0.00125	-0.00209	-0.00439	-0.00083	.00005	-0.00007	-0.01503	-0.00007
#2	-0.00138	-0.00496	-0.00482	.00089	-0.00012	-0.00002	-0.04524	.00034
#3	-0.00251	-0.00330	-0.00728	-0.00216	.00038	-0.00009	.00870	-0.00002

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00031	-0.00004	-0.00049	-0.00676	.03766	-0.00039	.05262	-0.00030
Stddev	.00017	.00010	.00072	.00742	.05005	.00357	.09058	.00093
%RSD	54.043	238.61	145.93	109.76	132.88	913.57	172.14	304.74

#1	.00026	-0.00004	-0.00129	.00137	.08606	.00235	.08410	.00074
#2	.00050	-0.00014	.00010	-.01316	-.01389	-.00442	-.04950	-.00064
#3	.00018	.00006	-0.00029	-.00850	.04083	.00090	.12326	-.00102

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00015	.03809	.00204	-0.01191	-0.00379	-0.00581	-0.00473	-0.00108
Stddev	.00022	.00587	.00303	.00725	.00039	.01002	.00607	.00344
%RSD	145.94	15.419	148.93	60.880	10.417	172.44	128.37	318.45

#1	-0.00040	.04340	-0.00146	-0.00513	-0.00397	.00559	.00214	.00289
#2	.00003	.03910	.00389	-.01105	-.00406	-.01325	-.00694	-.00327
#3	-0.00009	.03178	.00368	-.01955	-.00334	-.00978	-.00938	-.00286

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW A3 Acquired: 2/27/2017 16:02:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00022	.00028	-0.00182	-0.00349	.00014	.00010	.14384
Stddev	.00104	.00010	.00276	.00547	.00055	.00009	.11859
%RSD	466.49	36.708	151.81	156.74	380.09	95.647	82.443

#1	-0.00094	.00026	-0.00220	-0.00042	.00066	.00011	.01549
#2	.00054	.00020	.00111	-0.00024	-0.00043	.00018	.24933
#3	.00107	.00040	-0.00438	-0.00981	.00020	-0.00000	.16670

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5386.6	75302.	9487.0
Stddev	6.4	364.	74.0
%RSD	.11800	.48357	.78015

#1	5379.3	75028.	9403.1
#2	5389.9	75162.	9543.3
#3	5390.7	75715.	9514.4

Approved: February 28, 2017

Ki K Beck

Sample Name: LCSW A3 Acquired: 2/27/2017 16:06:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19851	5.1644	.18920	.93368	.49925	.02420	4.9310	.02473
Stddev	.00133	.0169	.00061	.00716	.00081	.00008	.0102	.00022
%RSD	.66898	.32760	.32406	.76649	.16309	.31148	.20744	.87416

#1	.19904	5.1604	.18943	.93406	.50009	.02424	4.9380	.02479
#2	.19699	5.1830	.18851	.92634	.49921	.02424	4.9357	.02492
#3	.19948	5.1498	.18967	.94064	.49846	.02411	4.9192	.02450

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10050	.24682	.24978	2.0067	24.668	.50100	4.9795	.24926
Stddev	.00023	.00064	.00226	.0335	.048	.00168	.0340	.00112
%RSD	.23092	.26065	.90575	1.6705	.19313	.33609	.68187	.45029

#1	.10056	.24642	.24953	2.0413	24.651	.49919	4.9597	.24897
#2	.10069	.24756	.25216	2.0043	24.722	.50128	4.9601	.24830
#3	.10024	.24648	.24766	1.9744	24.631	.50253	5.0187	.25049

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49688	24.818	.25196	4.7995	.25454	.58691	.18050	2.4753
Stddev	.00073	.031	.00074	.0062	.00789	.00416	.00769	.0073
%RSD	.14692	.12458	.29336	.12820	3.1001	.70921	4.2627	.29388

#1	.49637	24.814	.25160	4.7925	.24744	.58664	.17243	2.4785
#2	.49772	24.789	.25146	4.8042	.26304	.59120	.18130	2.4804
#3	.49656	24.850	.25281	4.8017	.25315	.58289	.18776	2.4669

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: LCSW A3 Acquired: 2/27/2017 16:06:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-03

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50080	.49673	.48983	.26169	.49444	.49339	.43985
Stddev	.00021	.00093	.00281	.00723	.00037	.00146	.31043
%RSD	.04278	.18811	.57268	2.7632	.07539	.29644	70.577
#1	.50072	.49779	.49278	.27003	.49409	.49267	.44284
#2	.50065	.49640	.48953	.25731	.49440	.49508	.12793
#3	.50105	.49601	.48719	.25772	.49483	.49243	.74878

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5334.2	73280.	9518.3
Stddev	11.3	17.	82.4
%RSD	.21270	.02350	.86584
#1	5346.7	73278.	9436.9
#2	5324.5	73298.	9601.7
#3	5331.5	73264.	9516.4

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702117002 Acquired: 2/27/2017 16:10:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00107	.00869	-0.00090	.00893	-0.00051	-0.00006	2.5038	.00022
Stddev	.00206	.00216	.00290	.00065	.00020	.00003	.0376	.00021
%RSD	192.64	24.851	323.16	7.2468	39.884	56.540	1.5030	97.169

#1	-0.00119	.01030	-0.00131	.00840	-0.00065	-0.00002	2.4632	.00000
#2	-0.00306	.00624	-0.00357	.00965	-0.00060	-0.00009	2.5107	.00023
#3	.00105	.00953	.00219	.00873	-0.00028	-0.00006	2.5376	.00043

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00033	-0.00031	.00034	.07295	12.440	.00180	.41963	.00720
Stddev	.00069	.00135	.00156	.00793	.090	.00473	.04131	.00061
%RSD	210.70	433.44	463.64	10.868	.72672	262.54	9.8450	8.4113

#1	.00048	.00111	.00201	.08202	12.340	.00362	.44798	.00718
#2	-0.00043	-0.00047	-0.00107	.06951	12.464	.00536	.43868	.00660
#3	.00094	-0.00157	.00007	.06732	12.516	-0.00357	.37223	.00781

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00054	24.710	.00421	1.3051	-0.00059	.00010	-0.00637	.15944
Stddev	.00060	.049	.00174	.0122	.00208	.00317	.00862	.00379
%RSD	110.42	.19856	41.403	.93531	350.11	3270.7	135.26	2.3783

#1	.00059	24.654	.00342	1.3157	-0.00224	-0.00335	-.01175	.15666
#2	-0.00008	24.736	.00620	1.3077	-0.00128	.00288	.00357	.16376
#3	.00111	24.741	.00300	1.2918	.00174	.00076	-.01094	.15789

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702117002 Acquired: 2/27/2017 16:10:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00027	.00217	-0.00334	-0.00683	.00013	.01649	.15755
Stddev	.00137	.00013	.00246	.00219	.00047	.00030	.16414
%RSD	503.09	6.1292	73.704	32.065	360.00	1.8205	104.19

#1	.00113	.00221	-.00577	-.00432	.00059	.01639	.13920
#2	-.00161	.00202	-.00342	-.00781	-.00034	.01626	.00334
#3	-.00035	.00228	-.00084	-.00836	.00014	.01683	.33009

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5315.5	73538.	9407.6
Stddev	16.0	397.	28.7
%RSD	.30069	.53959	.30547

#1	5330.5	73439.	9439.3
#2	5298.7	73201.	9383.3
#3	5317.4	73975.	9400.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702117005 Acquired: 2/27/2017 16:14:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00207	.02051	-0.00776	.00428	.00123	-0.00004	4.7259	.00037
Stddev	.00197	.00482	.00368	.00044	.00041	.00006	.0270	.00026
%RSD	95.201	23.500	47.443	10.348	33.528	139.43	.57101	71.280

#1	-0.00357	.02458	-0.01148	.00478	.00135	-0.00000	4.7566	.00024
#2	.00016	.02176	-0.00768	.00415	.00156	-0.00011	4.7057	.00067
#3	-0.00279	.01519	-0.00412	.00392	.00077	-0.00002	4.7154	.00019

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	.00002	-0.00007	.03571	1.1239	.00162	.20789	.04544
Stddev	.00050	.00115	.00269	.00554	.0114	.00254	.04333	.00175
%RSD	114.44	7154.9	3820.6	15.520	1.0157	156.69	20.843	3.8424

#1	.00008	-0.00098	-0.00067	.03653	1.1367	.00022	.17857	.04374
#2	.00100	-0.00024	-0.00241	.02980	1.1146	.00009	.25766	.04536
#3	.00023	.00127	.00287	.04079	1.1204	.00456	.18745	.04723

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00019	1.6169	.00307	.07353	-0.00312	-0.00607	-0.00757	.08207
Stddev	.00031	.0161	.00102	.00188	.00391	.00141	.00436	.00349
%RSD	165.22	.99447	33.168	2.5621	125.38	23.304	57.602	4.2532

#1	.00010	1.5988	.00394	.07571	-0.00454	-0.00522	-.01261	.08114
#2	-0.00051	1.6293	.00195	.07236	.00130	-0.00528	-.00511	.07914
#3	-0.00014	1.6227	.00330	.07253	-0.00612	-0.00770	-.00500	.08594

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702117005 Acquired: 2/27/2017 16:14:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0031	.00814	-0.0135	.00029	-0.0023	.00356	.17981
Stddev	.00089	.00026	.00385	.00411	.00064	.00024	.03826
%RSD	287.31	3.1810	286.07	1415.7	275.43	6.6626	21.280

#1	-0.0119	.00818	-0.0119	-0.0030	.00022	.00339	.19130
#2	.00060	.00786	.00243	.00466	-0.0096	.00346	.21100
#3	-0.0034	.00838	-0.0527	-0.0349	.00004	.00383	.13711

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5374.3	73078.	9286.5
Stddev	16.2	314.	37.6
%RSD	.30083	.42923	.40516

#1	5391.4	73432.	9295.6
#2	5372.1	72966.	9318.8
#3	5359.3	72835.	9245.2

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119101 Acquired: 2/27/2017 16:18:06 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00155	.04209	-0.00245	.03436	.18533	-0.00008	28.290	.00017
Stddev	.00136	.00274	.00459	.00105	.00074	.00005	.041	.00038
%RSD	87.518	6.4996	187.05	3.0447	.40152	58.067	.14317	223.32

#1	-0.00188	.03996	-0.00266	.03555	.18582	-0.00005	28.327	-0.00006
#2	-0.00006	.04113	.00224	.03362	.18570	-0.00006	28.296	-0.00004
#3	-0.00273	.04518	-0.00694	.03389	.18448	-0.00013	28.247	.00061

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	.00014	.01167	.23757	1.3437	.00429	13.459	.03020
Stddev	.00035	.00065	.00211	.01029	.0110	.00141	.085	.00082
%RSD	398.52	452.00	18.081	4.3318	.81695	32.838	.62902	2.7158

#1	-0.00031	.00079	.01368	.24695	1.3563	.00293	13.397	.03058
#2	.00023	.00015	.01184	.22657	1.3360	.00421	13.424	.02926
#3	.00034	-.00051	.00948	.23920	1.3388	.00574	13.555	.03076

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00080	17.461	.00221	-0.01614	-0.00003	-0.01023	.00328	3.5348
Stddev	.00071	.075	.00066	.00950	.00183	.00292	.00990	.0231
%RSD	88.683	.42748	29.943	58.886	5652.3	28.564	302.15	.65265

#1	.00093	17.547	.00278	-0.01819	-0.00192	-0.00715	-.00475	3.5081
#2	.00143	17.411	.00235	-0.00578	.00174	-0.01056	.01433	3.5488
#3	.00003	17.425	.00149	-0.02445	.00008	-0.01297	.00024	3.5473

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119101 Acquired: 2/27/2017 16:18:06 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0022	.75841	-0.00327	-0.00359	-0.00028	.02282	.16924
Stddev	.00071	.00073	.00213	.00435	.00013	.00041	.09672
%RSD	324.84	.09646	64.925	121.20	46.947	1.7987	57.148

#1	-0.00070	.75824	-0.00321	-.00850	-.00041	.02243	.24263
#2	-0.00056	.75921	-.00543	-.00210	-.00028	.02277	.20546
#3	.00060	.75778	-.00118	-.00018	-.00015	.02325	.05964

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5244.0	72923.	9332.2
Stddev	15.1	186.	71.4
%RSD	.28847	.25502	.76498

#1	5260.6	73074.	9269.2
#2	5240.2	72979.	9409.7
#3	5231.1	72715.	9317.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119102 Acquired: 2/27/2017 16:21:52 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00211	.07303	-0.00744	.07221	.03298	-0.00003	1.4078
Stddev	.00134	.00608	.00453	.00278	.00061	.00010	.0204
%RSD	63.383	8.3188	60.852	3.8568	1.8550	341.20	1.4523

#1	-0.00363	.06867	-0.00406	.07285	.03316	-0.00003	1.4091
#2	-0.00162	.07046	-0.00567	.06916	.03230	.00007	1.4276
#3	-0.00109	.07997	-0.01258	.07462	.03349	-0.00012	1.3867

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00015	-0.00010	-0.00041	.00074	.28935	.42429	.00630
Stddev	.00038	.00018	.00063	.00113	.01618	.01781	.00451
%RSD	255.01	168.10	154.38	153.87	5.5920	4.1985	71.623

#1	-0.00059	-0.00023	-0.00004	-0.00036	.27066	.42325	.00752
#2	.00009	-0.00018	-0.00005	.00067	.29891	.40701	.00130
#3	.00005	.00010	-0.00114	.00190	.29846	.44259	.01008

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.24101	.00428	.00082	70.406	.00157	.00991	-.00409
Stddev	.05212	.00187	.00076	.107	.00251	.01250	.00270
%RSD	21.623	43.746	92.924	.15163	160.05	126.18	66.023

#1	.27421	.00238	.00018	70.492	-0.00079	.01269	-.00572
#2	.26788	.00612	.00167	70.439	.00128	-0.00375	-.00557
#3	.18095	.00435	.00061	70.287	.00421	.02078	-.00097

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119102 Acquired: 2/27/2017 16:21:52 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.01144	F -0.01484	1.5644	.00006	.04568	-0.00079	-0.00586
Stddev	.00272	.00407	.0071	.00088	.00022	.00421	.00131
%RSD	23.805	27.443	.45527	1428.9	.48767	535.87	22.421

#1	-.00834	-.01891	1.5564	-.00008	.04556	.00399	-.00480
#2	-.01346	-.01483	1.5666	.00100	.04555	-.00240	-.00733
#3	-.01252	-.01077	1.5701	-.00074	.04594	-.00395	-.00546

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00060	.00102	.02840
Stddev	.00068	.00022	.16551
%RSD	112.00	21.612	582.69

#1	.00135	.00106	-.05475
#2	.00004	.00078	.21901
#3	.00042	.00121	-.07904

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5293.0	72796.	9511.8
Stddev	18.5	122.	34.1
%RSD	.34950	.16710	.35889

#1	5283.1	72741.	9479.5
#2	5281.5	72935.	9508.4
#3	5314.3	72711.	9547.5

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702119103 Acquired: 2/27/2017 16:25:40 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00033	.34589	-0.00225	.00686	.01750	-0.00002	12.587	.00018
Stddev	.00091	.00402	.00706	.00109	.00023	.00003	.080	.00034
%RSD	276.62	1.1633	314.47	15.960	1.3167	134.33	.63421	192.47

#1	-0.00019	.34942	-0.00205	.00566	.01735	.00001	12.580	.00013
#2	.00050	.34675	-0.00941	.00709	.01777	-0.00002	12.670	.00054
#3	-0.00131	.34151	.00471	.00781	.01739	-0.00005	12.511	-0.0014

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00032	-0.00051	-0.00068	.28146	.54359	.00533	1.9643	.00456
Stddev	.00023	.00016	.00136	.01159	.02745	.00171	.0210	.00216
%RSD	70.067	32.307	200.61	4.1187	5.0498	32.158	1.0692	47.389

#1	-0.00051	-0.00032	.00068	.27502	.55122	.00491	1.9631	.00402
#2	-0.00007	-0.00057	-0.00067	.27452	.56642	.00387	1.9440	.00272
#3	-0.00039	-0.00063	-0.00205	.29484	.51314	.00722	1.9859	.00694

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00008	1.3579	.00166	.00298	-0.00120	-0.00846	-0.00474	3.0976
Stddev	.00110	.0260	.00139	.00292	.00116	.00112	.00939	.0090
%RSD	1365.4	1.9136	83.685	98.124	96.365	13.183	198.07	.29030

#1	-0.00113	1.3444	.00033	.00211	-0.00237	-0.00898	.00601	3.1079
#2	.00036	1.3879	.00310	.00623	-0.00118	-0.00921	-0.00888	3.0939
#3	.00102	1.3415	.00156	.00059	-0.00006	-0.00718	-0.01135	3.0911

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702119103 Acquired: 2/27/2017 16:25:40 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0070	.03250	.00143	-0.01040	.00029	.00119	.42373
Stddev	.00135	.00021	.00437	.00072	.00025	.00039	.23638
%RSD	192.96	.65455	306.24	6.9029	88.093	32.879	55.785

#1	-0.00189	.03272	.00602	-.01112	.00004	.00164	.22152
#2	-0.00096	.03250	.00093	-.00968	.00055	.00098	.36608
#3	.00076	.03229	-.00268	-.01039	.00027	.00095	.68361

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5438.7	75295.	9727.7
Stddev	14.4	301.	21.5
%RSD	.26428	.40020	.22095

#1	5422.4	75384.	9728.0
#2	5449.7	74959.	9706.1
#3	5443.9	75541.	9749.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119104 Acquired: 2/27/2017 16:29:26 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00176	.09598	-0.00476	.00678	.04220	-0.00010	23.565	.00045
Stddev	.00054	.00393	.00253	.00208	.00074	.00005	.133	.00032
%RSD	30.978	4.0908	53.076	30.691	1.7514	50.576	.56315	72.168

#1	-0.00237	.09807	-0.00386	.00438	.04246	-0.00016	23.547	.00018
#2	-0.00159	.09145	-0.00762	.00813	.04278	-0.00005	23.705	.00081
#3	-0.00132	.09843	-0.00281	.00783	.04137	-0.00010	23.442	.00036

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00004	-0.00022	-0.00057	.12784	.54171	.00352	1.3141	.03557
Stddev	.00016	.00107	.00056	.01814	.09156	.00068	.0600	.00086
%RSD	421.81	485.85	99.268	14.187	16.903	19.371	4.5663	2.4230

#1	-0.00004	.00018	-0.00001	.14731	.44923	.00387	1.2538	.03464
#2	.00012	.00059	-0.00114	.12480	.63233	.00274	1.3739	.03634
#3	-0.00020	-0.00143	-0.00055	.11142	.54356	.00396	1.3145	.03573

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00051	1.1473	.00039	.01225	-0.00250	-0.00549	-0.00579	1.7326
Stddev	.00027	.0216	.00250	.00457	.00358	.00691	.00416	.0119
%RSD	53.435	1.8814	645.28	37.331	143.15	125.88	71.917	.68699

#1	.00072	1.1450	.00327	.00868	-0.00612	-0.00178	-0.00124	1.7363
#2	.00061	1.1699	-0.00118	.01065	-0.00243	-0.00123	-0.00673	1.7422
#3	.00020	1.1269	-0.00093	.01740	.00104	-0.01347	-0.00940	1.7193

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119104 Acquired: 2/27/2017 16:29:26 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00056	.04125	-0.00096	-0.00377	.00064	.00087	.17740
Stddev	.00119	.00013	.00090	.00374	.00114	.00007	.15950
%RSD	212.60	.32115	93.925	99.140	177.68	8.2567	89.907

#1	.00019	.04134	-.00117	-.00445	.00017	.00094	.27445
#2	.00006	.04131	.00003	.00026	-.00019	.00088	-.00668
#3	-.00194	.04110	-.00174	-.00712	.00194	.00079	.26444

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5350.5	74175.	9385.3
Stddev	22.1	520.	96.3
%RSD	.41384	.70158	1.0266

#1	5328.4	73987.	9290.0
#2	5350.3	74764.	9383.2
#3	5372.7	73776.	9482.7

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702119104PS Acquired: 2/27/2017 16:33:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604140-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19667	5.1881	.19108	.92441	.53592	.02399	26.246	.02457
Stddev	.00211	.0169	.00666	.00507	.00240	.00015	.094	.00029
%RSD	1.0732	.32609	3.4834	.54843	.44810	.64270	.35764	1.1890

#1	.19473	5.1864	.19188	.91919	.53708	.02416	26.300	.02479
#2	.19892	5.2058	.18406	.92931	.53316	.02392	26.138	.02424
#3	.19638	5.1721	.19730	.92473	.53751	.02388	26.301	.02467

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09925	.24641	.24869	2.1071	25.307	.50755	6.0932	.27945
Stddev	.00080	.00269	.00212	.0093	.127	.00267	.0150	.00261
%RSD	.80506	1.0930	.85380	.44332	.50019	.52621	.24691	.93233

#1	.09849	.24677	.24629	2.1157	25.427	.50642	6.0982	.28241
#2	.10008	.24356	.25032	2.0971	25.174	.50562	6.0763	.27752
#3	.09918	.24891	.24946	2.1084	25.318	.51059	6.1052	.27841

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49833	26.000	.24858	4.7845	.24793	.58412	.19255	4.1829
Stddev	.00126	.066	.00134	.0289	.00323	.00833	.00478	.0094
%RSD	.25205	.25207	.54039	.60333	1.3027	1.4266	2.4806	.22523

#1	.49710	26.018	.24810	4.7534	.24505	.57520	.19088	4.1721
#2	.49961	25.927	.25009	4.8103	.24733	.58547	.18883	4.1885
#3	.49828	26.054	.24754	4.7899	.25142	.59170	.19794	4.1882

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702119104PS Acquired: 2/27/2017 16:33:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604140-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49473	.53292	.49091	.24181	.49427	.48427	.54287
Stddev	.00195	.00107	.00529	.00211	.00243	.00083	.05053
%RSD	.39508	.20037	1.0775	.87282	.49121	.17072	9.3076
#1	.49260	.53279	.49577	.24367	.49334	.48331	.51561
#2	.49518	.53192	.48528	.23952	.49245	.48478	.60117
#3	.49643	.53405	.49167	.24226	.49703	.48471	.51182

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5275.9	72460.	9430.0
Stddev	18.8	402.	80.7
%RSD	.35618	.55469	.85591
#1	5274.3	72321.	9337.3
#2	5257.9	72145.	9485.2
#3	5295.4	72912.	9467.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119104SDL Acquired: 2/27/2017 16:36:55 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604140-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00038	.02100	-.00153	.00199	.00875	-.00004	4.8115
Stddev	.00122	.00243	.00412	.00059	.00064	.00004	.0241
%RSD	320.53	11.548	270.31	29.619	7.3342	82.346	.50006

#1	.00090	.02289	.00074	.00135	.00820	-.00000	4.7929
#2	-.00051	.01827	-.00629	.00211	.00945	-.00006	4.8387
#3	-.00152	.02184	.00097	.00252	.00858	-.00007	4.8030

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00033	-.00012	-.00116	.00072	.02436	.23697	.00389
Stddev	.00003	.00018	.00059	.00051	.00614	.01678	.00274
%RSD	8.1225	157.59	50.955	70.442	25.217	7.0829	70.491

#1	.00031	-.00022	-.00054	.00115	.01749	.23231	.00242
#2	.00036	-.00022	-.00172	.00084	.02933	.25560	.00705
#3	.00031	.00010	-.00123	.00016	.02626	.22301	.00219

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.16959	.00613	.00017	.24267	.00048	.00524	-.00354
Stddev	.08566	.00056	.00042	.01736	.00184	.00897	.00229
%RSD	50.509	9.0563	246.84	7.1550	385.09	171.30	64.797

#1	.23196	.00574	-.00023	.22969	.00239	.01482	-.00486
#2	.20490	.00677	.00060	.23592	.00034	-.00297	-.00487
#3	.07192	.00588	.00014	.26239	-.00129	.00386	-.00089

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702119104SDL Acquired: 2/27/2017 16:36:55 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604140-02

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00625	F -.01096	.36890	.00169	.00820	-.00048	.00106
Stddev	.00050	.01370	.00442	.00054	.00025	.00218	.00700
%RSD	8.0447	125.01	1.1988	32.131	3.1001	452.98	662.87

#1	-.00648	.00193	.37033	.00128	.00793	-.00185	.00065
#2	-.00659	-.00946	.36394	.00231	.00822	-.00162	.00825
#3	-.00567	-.02534	.37244	.00149	.00844	.00203	-.00573

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00007	.00101	.24432
Stddev	.00023	.00002	.10351
%RSD	328.12	1.5311	42.365

#1	-.00001	.00100	.14172
#2	.00033	.00102	.34871
#3	-.00011	.00099	.24254

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5552.8	75555.	9756.4
Stddev	16.4	266.	63.6
%RSD	.29487	.35142	.65205

#1	5545.8	75800.	9727.8
#2	5571.5	75273.	9712.1
#3	5541.0	75591.	9829.3

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 16:40:45 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40986	10.447	.41058	.51440	1.0207	.05072	10.184	.05123
Stddev	.00328	.035	.00657	.00227	.0019	.00008	.068	.00026
%RSD	.79915	.33711	1.6013	.44070	.18619	.15427	.66860	.50004

#1	.40896	10.468	.40499	.51178	1.0208	.05065	10.255	.05127
#2	.40713	10.466	.40893	.51572	1.0225	.05071	10.178	.05147
#3	.41349	10.406	.41783	.51569	1.0187	.05081	10.119	.05096

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20462	.51153	.51404	4.0883	50.861	1.0223	10.281	.51190
Stddev	.00015	.00063	.00384	.0068	.086	.0042	.083	.00232
%RSD	.07219	.12412	.74617	.16609	.16864	.41341	.80848	.45281

#1	.20467	.51093	.51502	4.0931	50.769	1.0266	10.265	.51308
#2	.20445	.51145	.51729	4.0805	50.938	1.0221	10.206	.51339
#3	.20474	.51220	.50981	4.0914	50.877	1.0182	10.370	.50923

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0135	50.778	.51406	10.230	.52041	1.2179	.40778	5.1016
Stddev	.0036	.079	.00155	.019	.00188	.0056	.00533	.0196
%RSD	.35710	.15653	.30178	.18391	.36123	.45555	1.3078	.38504

#1	1.0166	50.699	.51569	10.251	.52247	1.2242	.41256	5.1226
#2	1.0144	50.777	.51390	10.221	.51879	1.2155	.40875	5.0983
#3	1.0095	50.858	.51260	10.217	.51997	1.2140	.40202	5.0838

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 16:40:45 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0251	1.0225	1.0151	.52786	1.0203	1.0279	.95880
Stddev	.0004	.0008	.0040	.00671	.0022	.0020	.12472
%RSD	.03925	.07607	.39118	1.2714	.21405	.19116	13.008

#1	1.0256	1.0218	1.0145	.53436	1.0191	1.0280	.89432
#2	1.0250	1.0225	1.0114	.52826	1.0190	1.0298	1.1026
#3	1.0248	1.0233	1.0193	.52095	1.0228	1.0259	.87952

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5250.8	71102.	9422.2
Stddev	62.5	636.	78.4
%RSD	1.1895	.89488	.83225

#1	5309.0	71431.	9495.4
#2	5258.7	70369.	9339.5
#3	5184.8	71507.	9431.7

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 16:44:18 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00161	-.00386	-.00554	.00336	.00038	-.00006	.00558
Stddev	.00193	.00737	.00759	.00410	.00039	.00005	.03540
%RSD	119.75	190.62	137.11	122.12	100.37	83.320	634.06

#1	.00051	.00295	.00100	.00239	.00063	-.00006	.04409
#2	-.00209	-.01168	-.00375	.00785	-.00006	-.00010	-.02556
#3	-.00325	-.00286	-.01386	-.00017	.00059	-.00001	-.00178

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00017	.00039	.00099	-.00191	-.00221	.15145	.00453
Stddev	.00020	.00039	.00032	.00066	.00825	.07596	.00558
%RSD	119.85	100.74	32.040	34.429	373.77	50.152	123.15

#1	.00017	.00079	.00090	-.00186	-.00928	.21850	.00971
#2	-.00003	-.00000	.00135	-.00127	-.00419	.06896	.00527
#3	.00037	.00039	.00073	-.00258	.00685	.16690	-.00138

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.05519	.00190	-.00051	.05670	-.00039	.00271	F -.00594
Stddev	.03156	.00302	.00060	.03065	.00277	.00944	.00287
%RSD	57.183	159.39	117.53	54.062	719.10	349.06	48.308

#1	-.02353	.00333	-.00079	.09202	.00249	-.00797	-.00834
#2	-.08665	-.00158	.00018	.03698	-.00062	.00614	-.00276
#3	-.05538	.00394	-.00092	.04110	-.00303	.00995	-.00673

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							.00500
Low Limit							-.00500

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 16:44:18 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00812	-0.00299	-0.00010	-0.00064	.00053	-0.00282	-0.00330
Stddev	.00908	.00658	.00670	.00083	.00078	.00255	.00187
%RSD	111.86	219.90	6923.2	130.68	145.88	90.702	56.682

#1	.00217	-.00999	.00091	-.00159	.00136	-.00218	-.00534
#2	-.01502	-.00206	.00604	-.00004	-.00018	-.00064	-.00167
#3	-.01149	.00307	-.00724	-.00029	.00042	-.00563	-.00289

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00066	-0.00087	F .20515
Stddev	.00035	.00031	.17009
%RSD	52.473	35.494	82.909

#1	-.00063	-.00100	.39618
#2	-.00033	-.00110	.14910
#3	-.00102	-.00052	.07016

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5134.9	72754.	9113.6
Stddev	25.8	35.	30.6
%RSD	.50332	.04865	.33624

#1	5164.7	72714.	9103.1
#2	5119.0	72773.	9148.1
#3	5121.0	72777.	9089.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119105 Acquired: 2/27/2017 16:48:09 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00211	.32647	-0.00395	.00733	.02297	-0.00003	14.801	.00014
Stddev	.00175	.00182	.00266	.00102	.00024	.00003	.051	.00054
%RSD	83.079	.55673	67.359	13.868	1.0370	77.422	.34479	385.52

#1	-0.00165	.32779	-0.00516	.00687	.02298	-0.00006	14.844	.00040
#2	-0.00404	.32439	-0.00579	.00662	.02321	-0.00003	14.745	.00051
#3	-0.00063	.32722	-0.00090	.00849	.02273	-0.00001	14.814	-0.00048

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	-0.00048	.00076	.29332	.56570	.00301	2.0315	.05855
Stddev	.00072	.00014	.00085	.01358	.07064	.00173	.0289	.00168
%RSD	167.89	28.525	111.19	4.6313	12.488	57.306	1.4242	2.8669

#1	.00113	-0.00044	.00118	.27841	.52526	.00471	2.0528	.05741
#2	.00045	-0.00036	-0.00021	.30499	.52457	.00307	1.9986	.05775
#3	-0.00030	-0.00063	.00133	.29655	.64727	.00126	2.0432	.06048

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00013	1.6750	.00261	.01157	-0.00030	-0.00179	-0.00336	2.5658
Stddev	.00047	.0135	.00011	.00114	.00414	.00324	.00918	.0115
%RSD	357.41	.80839	4.2973	9.8366	1375.9	180.99	273.44	.44728

#1	.00066	1.6732	.00270	.01279	-0.00437	-0.00521	-.01358	2.5759
#2	-0.00006	1.6624	.00266	.01054	.00391	-0.00138	-0.00068	2.5681
#3	-0.00021	1.6893	.00249	.01138	-0.00044	.00123	.00419	2.5533

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119105 Acquired: 2/27/2017 16:48:09 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00048	.04603	.00213	-.00522	.00050	.00429	.08909
Stddev	.00059	.00062	.00165	.00348	.00060	.00027	.28684
%RSD	122.13	1.3504	77.442	66.595	119.98	6.3320	321.95

#1	-.00005	.04605	.00069	-.00356	.00104	.00459	-.13507
#2	.00112	.04540	.00393	-.00922	.00062	.00419	.41234
#3	.00038	.04664	.00177	-.00289	-.00015	.00407	-.00999

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5318.6	73693.	9238.2
Stddev	32.5	525.	64.1
%RSD	.61194	.71200	.69383

#1	5285.7	74276.	9168.9
#2	5319.3	73257.	9295.3
#3	5350.7	73547.	9250.5

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702119106 Acquired: 2/27/2017 16:51:55 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00131	.88413	-0.00127	.00626	.03439	-0.00005	23.171	.00044
Stddev	.00117	.00518	.00336	.00149	.00066	.00005	.095	.00010
%RSD	89.685	.58567	263.70	23.827	1.9124	109.35	.40923	22.695

#1	-0.00131	.88559	-0.00012	.00796	.03509	-0.00010	23.159	.00053
#2	-0.00013	.87838	.00135	.00519	.03379	-0.00006	23.083	.00046
#3	-0.00248	.88842	-0.00505	.00563	.03428	.00001	23.272	.00033

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00004	.00130	.00087	.55348	.53677	.00444	2.4063	.01048
Stddev	.00031	.00041	.00254	.00422	.03814	.00090	.0688	.00023
%RSD	794.77	31.095	293.15	.76233	7.1055	20.210	2.8570	2.1814

#1	.00026	.00084	.00380	.55389	.53630	.00447	2.4513	.01070
#2	-0.00031	.00158	-0.00062	.54907	.49886	.00353	2.4405	.01050
#3	.00016	.00149	-0.00058	.55747	.57514	.00533	2.3272	.01025

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00003	1.7088	.00163	.00522	-0.00096	.00446	-0.00666	2.9864
Stddev	.00016	.0093	.00180	.00185	.00037	.00373	.00704	.0140
%RSD	601.12	.54268	110.19	35.457	38.937	83.776	105.70	.46977

#1	.00004	1.6998	-0.00042	.00664	-0.00119	.00620	-.01459	2.9932
#2	-0.00014	1.7083	.00294	.00588	-0.00116	.00700	-0.00118	2.9957
#3	.00018	1.7183	.00238	.00313	-0.00053	.00017	-0.00419	2.9703

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119106 Acquired: 2/27/2017 16:51:55 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00027	.06742	.00773	-.00715	.00053	.00161	.53352
Stddev	.00144	.00007	.00152	.00243	.00047	.00005	.08407
%RSD	528.74	.10465	19.607	33.997	88.754	3.2867	15.757

#1	.00008	.06747	.00752	-.00478	.00074	.00167	.61193
#2	-.00106	.06746	.00934	-.00703	.00085	.00156	.44476
#3	.00180	.06734	.00633	-.00963	-.00001	.00160	.54389

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5301.5	73162.	9457.6
Stddev	22.8	477.	63.0
%RSD	.42968	.65149	.66633

#1	5325.0	72754.	9437.2
#2	5279.6	73045.	9528.3
#3	5300.0	73686.	9407.4

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702120101 Acquired: 2/27/2017 16:55:41 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0288	.05288	.00210	.14014	.17807	.00004	67.708
Stddev	.00235	.00559	.00341	.00083	.00121	.00008	.337
%RSD	81.486	10.565	162.51	.59235	.67873	168.45	.49828

#1	-0.0212	.05421	-0.0096	.14037	.17789	.00012	67.655
#2	-0.0101	.04674	.00147	.13921	.17695	-0.0003	67.400
#3	-0.0551	.05767	.00577	.14082	.17935	.00004	68.068

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00004	.00806	.00656	.00336	.25239	5.9890	.02659
Stddev	.00054	.00036	.00094	.00135	.01753	.1707	.00159
%RSD	1392.0	4.4928	14.369	40.313	6.9443	2.8505	5.9726

#1	.00062	.00803	.00615	.00208	.26184	5.8082	.02697
#2	-0.0044	.00771	.00588	.00322	.23217	6.0115	.02795
#3	-0.0007	.00843	.00763	.00478	.26316	6.1474	.02484

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.9921	.14227	.00601	F 1707.2	.02395	3.9815	-0.0196
Stddev	.1179	.00113	.00061	24.7	.00102	.0046	.00088
%RSD	1.1796	.79487	10.168	1.4473	4.2752	.11623	44.678

#1	10.119	.14337	.00555	1734.6	.02419	3.9820	-0.0140
#2	9.8861	.14111	.00670	1686.7	.02283	3.9766	-0.0297
#3	9.9712	.14235	.00578	1700.4	.02484	3.9858	-0.0151

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702120101 Acquired: 2/27/2017 16:55:41 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00679	.00147	3.4264	-0.00052	3.5570	-0.00859	-0.00952
Stddev	.00861	.00720	.0024	.00104	.0100	.00591	.00105
%RSD	126.90	488.22	.06884	200.72	.28168	68.798	10.997

#1	-0.01430	.00764	3.4237	-0.00049	3.5596	-0.01390	-0.01070
#2	.00261	.00322	3.4282	.00051	3.5460	-0.00223	-0.00916
#3	-0.00867	-0.00643	3.4272	-0.00158	3.5655	-0.00963	-0.00870

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00003	.07379	.03798
Stddev	.00015	.00020	.26363
%RSD	525.80	.27749	694.11

#1	-0.00014	.07381	.26328
#2	-0.00009	.07357	-.25195
#3	.00014	.07398	.10261

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4548.7	59286.	9165.4
Stddev	19.3	153.	173.6
%RSD	.42319	.25879	1.8936

#1	4530.7	59190.	9256.1
#2	4569.0	59463.	9274.7
#3	4546.3	59205.	8965.3

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702120301 Acquired: 2/27/2017 16:59:37 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0042	.15373	-0.00099	.14492	.28197	.00012	100.49
Stddev	.00271	.00267	.00454	.00093	.00129	.00004	.08
%RSD	650.49	1.7355	459.35	.64077	.45806	33.557	.07471

#1	-.00172	.15146	.00139	.14529	.28105	.00008	100.42
#2	.00270	.15308	.00186	.14561	.28345	.00016	100.47
#3	-.00223	.15667	-.00622	.14387	.28142	.00013	100.57

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00090	.01183	.00787	.00625	3.0628	6.0008	.02759
Stddev	.00066	.00022	.00150	.00062	.0075	.0662	.00350
%RSD	73.543	1.9016	19.094	9.9537	.24367	1.1027	12.670

#1	.00094	.01205	.00638	.00694	3.0576	5.9270	.02895
#2	.00022	.01160	.00784	.00572	3.0595	6.0207	.02362
#3	.00154	.01182	.00939	.00609	3.0714	6.0548	.03020

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	24.968	.55477	.00516	F 1635.7	.02768	1.9695	-.00430
Stddev	.092	.00294	.00110	12.7	.00160	.0074	.00340
%RSD	.36755	.52996	21.394	.77847	5.7946	.37760	78.957

#1	24.867	.55204	.00407	1628.7	.02598	1.9781	-.00703
#2	24.992	.55440	.00512	1650.4	.02917	1.9655	-.00539
#3	25.045	.55788	.00628	1628.1	.02788	1.9650	-.00050

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702120301 Acquired: 2/27/2017 16:59:37 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00765	-0.00518	6.1530	.00114	3.9791	-0.01174	-0.00275
Stddev	.00286	.00441	.0118	.00027	.0055	.00384	.00700
%RSD	37.458	85.134	.19245	23.642	.13927	32.721	254.14

#1	-0.01090	-0.00828	6.1521	.00144	3.9817	-0.00731	-0.01030
#2	-0.00655	-0.00712	6.1652	.00104	3.9829	-0.01401	.00353
#3	-0.00550	-0.00013	6.1416	.00093	3.9728	-0.01390	-0.00150

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00182	.31290	F -.42921
Stddev	.00033	.00071	.12872
%RSD	18.384	.22792	29.991

#1	.00185	.31327	-.49224
#2	.00213	.31336	-.51426
#3	.00147	.31208	-.28111

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4521.5	59068.	8796.9
Stddev	6.4	453.	62.3
%RSD	.14245	.76740	.70781

#1	4528.9	58771.	8868.5
#2	4517.1	58845.	8755.4
#3	4518.4	59590.	8766.7

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125001 Acquired: 2/27/2017 17:03:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00186	.82282	.00043	.04384	.04102	.00254	19.635	.00108
Stddev	.00108	.01402	.00200	.00140	.00062	.00005	.050	.00019
%RSD	58.057	1.7035	466.08	3.1919	1.5178	2.1288	.25606	17.188

#1	-.00296	.82391	.00186	.04334	.04035	.00260	19.581	.00099
#2	-.00080	.83627	-.00186	.04542	.04114	.00249	19.644	.00130
#3	-.00181	.80830	.00128	.04276	.04158	.00255	19.681	.00096

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.12549	.00137	.01107	4.6938	4.3542	.00805	11.297	.68807
Stddev	.00042	.00075	.00168	.0318	.0570	.00080	.025	.00209
%RSD	.33478	54.966	15.171	.67656	1.3083	9.9614	.21752	.30367

#1	.12504	.00209	.01295	4.6949	4.3426	.00785	11.324	.68565
#2	.12587	.00143	.00972	4.6614	4.3040	.00736	11.289	.68918
#3	.12556	.00059	.01053	4.7249	4.4161	.00893	11.277	.68936

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00006	29.473	.08390	.04419	.00009	-.00249	-.00121	6.4652
Stddev	.00019	.133	.00187	.00294	.00216	.00812	.00322	.0173
%RSD	315.81	.45267	2.2318	6.6634	2467.2	326.36	265.72	.26774

#1	-.00003	29.561	.08388	.04744	.00246	.00405	.00091	6.4599
#2	.00027	29.320	.08204	.04340	-.00179	-.01157	-.00491	6.4845
#3	-.00007	29.538	.08579	.04172	-.00040	.00006	.00037	6.4511

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125001 Acquired: 2/27/2017 17:03:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00191	.11650	.00991	-.00638	.00166	.41234	.35906
Stddev	.00062	.00086	.00414	.00925	.00062	.00029	.12309
%RSD	32.420	.73954	41.744	145.03	37.533	.06940	34.282

#1	.00223	.11560	.00635	.00390	.00144	.41207	.49932
#2	.00230	.11658	.01445	-.01402	.00237	.41264	.26903
#3	.00120	.11732	.00892	-.00901	.00118	.41232	.30883

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5260.2	72769.	9358.7
Stddev	44.5	582.	75.6
%RSD	.84678	.79997	.80764

#1	5211.0	72148.	9350.1
#2	5271.9	72857.	9438.2
#3	5297.8	73302.	9287.7

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702125304 Acquired: 2/27/2017 17:07:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00245	.02907	.01984	.05414	16.268	.00027	F 1213.0
Stddev	.00234	.00855	.00078	.00111	.120	.00003	31.5
%RSD	95.222	29.411	3.9483	2.0468	.73851	12.837	2.5971

#1	-.00064	.02241	.01992	.05371	16.398	.00031	1246.9
#2	-.00509	.03871	.01901	.05540	16.246	.00025	1207.7
#3	-.00164	.02609	.02057	.05331	16.161	.00025	1184.5

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00571	.01294	.00017	.02049	25.140	224.49	.89034
Stddev	.00018	.00009	.00123	.00083	.094	1.33	.00602
%RSD	3.0910	.71607	704.18	4.0674	.37550	.59066	.67604

#1	.00574	.01301	.00158	.02116	25.145	224.60	.88394
#2	.00587	.01297	-.00034	.01955	25.231	225.76	.89588
#3	.00552	.01283	-.00071	.02076	25.043	223.12	.89121

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	68.796	5.2833	.00440	113.09	.10497	.09571	.00208
Stddev	.194	.0136	.00057	.62	.00154	.00389	.01068
%RSD	.28172	.25718	12.985	.55068	1.4665	4.0618	512.45

#1	68.574	5.2683	.00505	113.32	.10509	.09269	-.00798
#2	68.932	5.2947	.00396	113.57	.10337	.10010	.00095
#3	68.882	5.2871	.00419	112.39	.10644	.09435	.01329

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125304 Acquired: 2/27/2017 17:07:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02808	F -.05429	3.2624	.00404	F 14.543	F -.10054	-.01859
Stddev	.00037	.01674	.0081	.00204	.411	.00233	.00379
%RSD	1.3126	30.836	.24794	50.468	2.8292	2.3214	20.385

#1	-.02767	-.07117	3.2537	.00585	14.967	-.10316	-.01967
#2	-.02837	-.05402	3.2639	.00445	14.517	-.09977	-.02172
#3	-.02821	-.03769	3.2696	.00183	14.145	-.09869	-.01438

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00075	.01756	F -1.1513
Stddev	.00070	.00008	.1678
%RSD	93.164	.45632	14.576

#1	.00129	.01758	-.98905
#2	.00101	.01747	-1.1407
#3	-.00004	.01763	-1.3242

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4416.6	60525.	8996.4
Stddev	7.3	265.	81.1
%RSD	.16638	.43843	.90123

#1	4424.6	60483.	8924.1
#2	4414.9	60809.	8981.1
#3	4410.2	60283.	9084.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125306 Acquired: 2/27/2017 17:11:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.00557	.23022	.02435	.06607	3.0065	.00022	F 1098.3
Stddev	.00341	.00422	.00427	.00142	.0038	.00000	16.7
%RSD	61.265	1.8331	17.554	2.1483	.12519	1.0176	1.5242

#1	-.00291	.22635	.02319	.06593	3.0046	.00022	1087.1
#2	-.00438	.22958	.02909	.06472	3.0040	.00022	1117.5
#3	-.00942	.23472	.02078	.06755	3.0108	.00022	1090.2

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit	5.0000						270.00
Low Limit	-.00400						-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00438	.00540	.00047	.03786	.00316	192.81	.94848
Stddev	.00061	.00057	.00152	.00215	.02557	.60	.00175
%RSD	13.967	10.500	320.20	5.6739	810.13	.31134	.18461

#1	.00505	.00605	.00150	.03544	.00778	193.21	.94654
#2	.00385	.00508	.00119	.03954	.02610	193.11	.94895
#3	.00424	.00506	-.00127	.03859	-.02441	192.12	.94995

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21669	.00211	.01056	71.010	1.6268	.10377	.00243
Stddev	.07469	.00038	.00118	.297	.0015	.00780	.00355
%RSD	34.468	18.129	11.185	.41778	.09485	7.5132	146.10

#1	.16580	.00214	.01131	71.210	1.6257	.09818	-.00021
#2	.18183	.00172	.00920	71.151	1.6261	.11268	.00646
#3	.30243	.00248	.01118	70.669	1.6286	.10047	.00103

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125306 Acquired: 2/27/2017 17:11:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02557	F -.03717	3.1796	.00619	6.5630	F -.09865	F -.01849
Stddev	.00735	.00568	.0047	.00025	.0057	.00094	.00539
%RSD	28.736	15.267	.14734	4.0276	.08714	.94950	29.156

#1	-.03115	-.04350	3.1742	.00645	6.5674	-.09766	-.02405
#2	-.02830	-.03254	3.1821	.00596	6.5651	-.09952	-.01328
#3	-.01724	-.03548	3.1824	.00617	6.5566	-.09878	-.01816

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit	45.000	90.000				36.000	
Low Limit	-.02000	-.01000				-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00718	.02028	F -.42630
Stddev	.00063	.00019	.08077
%RSD	8.8321	.92165	18.948

#1	.00791	.02049	-.51844
#2	.00686	.02024	-.39283
#3	.00677	.02012	-.36765

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4462.2	60682.	8929.4
Stddev	19.3	380.	52.0
%RSD	.43195	.62559	.58264

#1	4454.7	61047.	8888.4
#2	4484.1	60711.	8911.9
#3	4447.8	60290.	8987.9

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125601 Acquired: 2/27/2017 17:15:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00024	2.1002	.00972	.05159	.04067	.00031	12.139	.00062
Stddev	.00033	.0099	.00145	.00037	.00040	.00010	.065	.00017
%RSD	137.19	.47023	14.910	.71535	.97706	31.414	.53919	27.510

#1	.00003	2.1107	.01045	.05170	.04111	.00037	12.214	.00047
#2	-0.00060	2.0910	.00805	.05118	.04034	.00020	12.092	.00080
#3	-0.00015	2.0988	.01067	.05190	.04056	.00036	12.112	.00059

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00899	.00328	.00760	18.501	4.4880	.01136	6.8260	1.1435
Stddev	.00034	.00168	.00148	.061	.0539	.00398	.0374	.0019
%RSD	3.8208	51.420	19.527	.32941	1.2000	35.002	.54831	.16965

#1	.00939	.00490	.00705	18.568	4.5495	.01531	6.8602	1.1442
#2	.00884	.00153	.00928	18.486	4.4657	.01140	6.8319	1.1451
#3	.00875	.00340	.00647	18.448	4.4490	.00736	6.7860	1.1414

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00007	60.566	.00738	.19108	.00480	.00498	-.00792	8.2395
Stddev	.00078	.053	.00077	.01059	.00305	.00362	.01565	.0206
%RSD	1155.2	.08769	10.475	5.5436	63.456	72.784	197.67	.25000

#1	.00078	60.621	.00656	.17896	.00743	.00556	.00484	8.2592
#2	-0.00075	60.515	.00750	.19571	.00146	.00110	-.00322	8.2181
#3	-0.00023	60.562	.00809	.19857	.00553	.00827	-.02539	8.2411

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125601 Acquired: 2/27/2017 17:15:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00087	.05162	.03154	-.01069	.00574	.08923	.77091
Stddev	.00021	.00034	.00049	.00243	.00031	.00043	.06674
%RSD	23.553	.65776	1.5492	22.710	5.4553	.48326	8.6573

#1	.00083	.05190	.03197	-.01345	.00578	.08952	.75413
#2	.00109	.05172	.03101	-.00971	.00603	.08873	.84444
#3	.00069	.05125	.03165	-.00890	.00541	.08943	.71416

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5275.2	72953.	9388.6
Stddev	5.6	241.	48.2
%RSD	.10577	.33017	.51321

#1	5270.0	72868.	9422.8
#2	5281.1	72765.	9333.5
#3	5274.5	73224.	9409.6

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702125901 Acquired: 2/27/2017 17:19:02 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00140	.67116	.00426	.04677	.08676	-0.00003	30.853	.00065
Stddev	.00081	.00631	.00273	.00083	.00047	.00005	.081	.00011
%RSD	58.177	.94035	63.967	1.7766	.54079	191.92	.26271	16.295

#1	-0.00060	.67806	.00124	.04582	.08720	-0.00009	30.770	.00058
#2	-0.00137	.66973	.00654	.04712	.08627	.00002	30.858	.00059
#3	-0.00222	.66568	.00501	.04737	.08683	-0.00001	30.932	.00077

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00090	.00273	.00373	9.6146	2.9562	.00235	8.8912	3.6613
Stddev	.00025	.00158	.00138	.0315	.0243	.00279	.0676	.0138
%RSD	27.611	58.055	37.025	.32732	.82323	118.63	.75990	.37726

#1	.00062	.00405	.00312	9.5804	2.9314	.00557	8.9310	3.6491
#2	.00110	.00315	.00275	9.6208	2.9800	.00081	8.8132	3.6585
#3	.00099	.00097	.00530	9.6424	2.9573	.00068	8.9295	3.6763

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00009	13.801	.00411	.16526	-0.00224	-0.00920	-0.00428	4.3247
Stddev	.00054	.027	.00252	.01031	.00332	.00861	.01429	.0204
%RSD	621.00	.19442	61.252	6.2414	148.51	93.635	333.61	.47264

#1	.00051	13.770	.00690	.17485	.00116	-0.00029	.00936	4.3105
#2	-0.00054	13.810	.00203	.15435	-0.00238	-0.01747	-0.00307	4.3155
#3	-0.00023	13.821	.00339	.16659	-0.00549	-0.00982	-0.01915	4.3481

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702125901 Acquired: 2/27/2017 17:19:02 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00197	.12857	.01095	-.00663	.00195	.11830	.22939
Stddev	.00028	.00047	.00372	.00431	.00072	.00030	.16471
%RSD	14.217	.36913	33.955	65.036	36.981	.25628	71.802

#1	.00218	.12805	.01507	-.01154	.00145	.11856	.41887
#2	.00208	.12898	.00993	-.00344	.00163	.11797	.12042
#3	.00166	.12868	.00785	-.00491	.00278	.11837	.14889

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5408.7	74446.	9578.1
Stddev	26.9	162.	23.5
%RSD	.49677	.21784	.24529

#1	5379.6	74359.	9593.7
#2	5413.7	74633.	9589.5
#3	5432.7	74346.	9551.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126101 Acquired: 2/27/2017 17:22:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00129	.01393	-0.00388	.03104	1.5689	-0.00012	109.39
Stddev	.00134	.00439	.00180	.00083	.0025	.00003	.07
%RSD	103.46	31.504	46.246	2.6879	.16021	25.571	.06702

#1	.00129	.01472	-0.00574	.03011	1.5661	-0.00010	109.42
#2	.00263	.00920	-0.00215	.03173	1.5706	-0.00015	109.43
#3	-0.00004	.01786	-0.00376	.03128	1.5702	-0.00010	109.30

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00012	.00025	-0.00166	.00445	72.235	2.6680	.01193
Stddev	.00026	.00050	.00064	.00138	.256	.0304	.00151
%RSD	210.73	197.44	38.846	31.089	.35471	1.1404	12.697

#1	-0.00005	-0.00004	-0.00097	.00559	71.979	2.6334	.01076
#2	.00009	.00083	-0.00176	.00486	72.236	2.6905	.01139
#3	-0.00041	-0.00003	-0.00224	.00291	72.491	2.6801	.01364

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	21.475	3.6167	-0.00085	101.86	-0.00144	-0.01897	-0.00088
Stddev	.046	.0115	.00055	.49	.00173	.00756	.00296
%RSD	.21337	.31891	64.452	.48183	120.37	39.873	337.71

#1	21.422	3.6053	-0.00024	101.48	-0.00040	-0.01095	.00248
#2	21.504	3.6166	-0.00129	101.68	-0.00343	-0.01999	-0.00197
#3	21.500	3.6283	-0.00102	102.41	-0.00048	-0.02597	-0.00314

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126101 Acquired: 2/27/2017 17:22:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00790	-0.00067	4.4586	.00095	.99046	.00440	-0.00075
Stddev	.00140	.00816	.0158	.00024	.00153	.00417	.00783
%RSD	17.658	1220.2	.35453	25.225	.15466	94.766	1049.2

#1	-0.00807	-0.00877	4.4411	.00119	.98958	.00197	-0.00942
#2	-0.00643	.00756	4.4628	.00096	.98957	.00202	.00580
#3	-0.00921	-0.00080	4.4719	.00071	.99223	.00922	.00138

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00074	.00248	F -2.2218
Stddev	.00011	.00012	.2035
%RSD	15.051	4.7502	9.1608

#1	-0.00070	.00256	-2.3759
#2	-0.00086	.00252	-1.9910
#3	-0.00064	.00234	-2.2984

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-0.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5198.1	71467.	9589.8
Stddev	5.0	328.	36.7
%RSD	.09636	.45955	.38224

#1	5195.4	71602.	9577.9
#2	5195.0	71707.	9631.0
#3	5203.8	71093.	9560.6

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 17:26:33 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40941	10.431	.40943	.51427	1.0271	.05134	10.226
Stddev	.00090	.021	.00585	.00377	.0006	.00011	.010
%RSD	.21901	.19805	1.4284	.73310	.05369	.21041	.09653

#1	.40937	10.431	.41204	.51278	1.0275	.05143	10.234
#2	.40853	10.452	.41352	.51856	1.0265	.05122	10.215
#3	.41032	10.410	.40273	.51148	1.0275	.05136	10.229

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05087	.20573	.51755	.51851	4.0818	51.536	1.0255
Stddev	.00029	.00019	.00228	.00054	.0157	.234	.0044
%RSD	.57177	.09052	.44127	.10446	.38491	.45342	.42513

#1	.05116	.20564	.51554	.51790	4.0997	51.444	1.0288
#2	.05058	.20561	.52003	.51893	4.0755	51.802	1.0206
#3	.05089	.20594	.51708	.51869	4.0702	51.363	1.0271

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.265	.51104	1.0201	51.186	.51683	10.110	.52029
Stddev	.064	.00079	.0014	.158	.00213	.063	.00186
%RSD	.62654	.15379	.13348	.30890	.41118	.61941	.35674

#1	10.268	.51182	1.0198	51.110	.51924	10.181	.51847
#2	10.327	.51106	1.0216	51.368	.51524	10.062	.52022
#3	10.199	.51025	1.0190	51.080	.51601	10.087	.52218

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 17:26:33 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2153	4.0620	5.0789	1.0314	1.0281	1.0163	5.1656
Stddev	.0076	.00176	.0102	.0022	.0012	.0043	.00180
%RSD	.62795	.43404	.20020	.21638	.11678	.42163	.34760

#1	1.2234	.40697	5.0886	1.0339	1.0288	1.0127	.51487
#2	1.2143	.40418	5.0798	1.0305	1.0287	1.0211	.51844
#3	1.2082	.40745	5.0683	1.0297	1.0267	1.0152	.51637

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0300	1.0434	F 1.1355
Stddev	.0033	.0019	.1097
%RSD	.32390	.18259	9.6576

#1	1.0336	1.0451	1.0709
#2	1.0295	1.0439	1.2621
#3	1.0269	1.0413	1.0734

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5227.8	72228.	9579.0
Stddev	21.6	108.	38.5
%RSD	.41227	.14940	.40145

#1	5219.4	72269.	9618.5
#2	5211.8	72309.	9541.7
#3	5252.3	72105.	9576.8

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 17:30:08 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00048	-0.00290	-0.00501	.00108	.00027	.00002	-0.00688	.00015
Stddev	.00069	.00340	.00199	.00357	.00021	.00004	.01179	.00024
%RSD	144.39	117.46	39.638	329.45	78.262	162.42	171.26	153.09

#1	.00023	-0.00004	-0.00280	.00495	.00010	-0.00001	-0.00716	-0.00008
#2	-0.00051	-0.00666	-0.00665	.00039	.00051	.00006	-0.01853	.00039
#3	-0.00116	-0.00199	-0.00558	-0.00209	.00021	.00002	.00504	.00015

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00026	.00010	-0.00049	-0.00784	.09070	.00132	-0.01956	-0.00061
Stddev	.00002	.00044	.00118	.00714	.03460	.00124	.09300	.00029
%RSD	7.0509	428.88	241.03	91.124	38.151	93.986	475.32	47.355

#1	.00026	-0.00014	-0.00168	-0.01585	.05233	.00106	-0.02991	-0.00082
#2	.00025	-0.00016	-0.00047	-0.00213	.10023	.00267	.07817	-0.00028
#3	.00028	.00061	.00068	-0.00554	.11955	.00023	-0.10696	-0.00074

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00028	.10164	.00234	.00959	-0.00326	-0.00954	-0.00041	.00463
Stddev	.00023	.01807	.00136	.00109	.00303	.00618	.01265	.00488
%RSD	80.389	17.779	58.061	11.357	92.883	64.798	3114.7	105.38

#1	-0.00044	.11904	.00135	.01013	-0.00261	-0.01087	.00959	.00981
#2	-0.00038	.10290	.00178	.00834	-0.00061	-0.01495	-0.01463	.00012
#3	-0.00002	.08297	.00389	.01031	-0.00656	-0.00280	.00382	.00396

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 17:30:08 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00012	.00008	-0.00482	-0.00718	.00050	-0.00072	-0.01813
Stddev	.00149	.00024	.00150	.00289	.00095	.00004	.22491
%RSD	1202.2	303.19	31.114	40.274	188.16	6.0084	1240.5

#1	.00100	.00013	-0.00310	-0.00890	.00107	-0.00070	.23907
#2	-0.00159	-0.00018	-0.00580	-0.00881	-0.00059	-0.00070	-0.11563
#3	.00096	.00028	-0.00557	-0.00384	.00103	-0.00077	-0.17783

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5265.0	72324.	9043.3
Stddev	20.0	303.	27.6
%RSD	.38006	.41930	.30507

#1	5247.8	72453.	9059.0
#2	5260.4	71978.	9011.4
#3	5287.0	72542.	9059.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126102 Acquired: 2/27/2017 17:33:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00251	.00828	-0.00025	.05537	.15934	-0.00008	10.146	.00007
Stddev	.00071	.00118	.00205	.00149	.00135	.00002	.084	.00030
%RSD	28.143	14.294	817.19	2.6863	.84608	29.276	.83093	422.21

#1	-0.00196	.00720	.00109	.05705	.15986	-0.00010	10.116	-0.00027
#2	-0.00226	.00954	.00077	.05483	.16036	-0.00008	10.241	.00023
#3	-0.00330	.00809	-0.00261	.05423	.15781	-0.00006	10.080	.00025

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00020	.00010	.00383	.00960	1.5135	.00892	1.1830	.00616
Stddev	.00034	.00027	.00040	.00526	.0488	.00286	.0969	.00045
%RSD	170.52	287.04	10.561	54.786	3.2235	32.067	8.1890	7.3549

#1	-0.00037	-0.00003	.00403	.01124	1.4583	.00585	1.1818	.00582
#2	.00019	.00041	.00409	.01384	1.5313	.00938	1.0867	.00668
#3	-0.00041	-0.00010	.00336	.00372	1.5509	.01152	1.2804	.00599

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00363	117.42	.00110	-0.00792	-0.00340	-0.00112	.00434	3.9666
Stddev	.00085	.49	.00061	.00900	.00221	.00530	.01211	.0164
%RSD	23.432	.41507	55.094	113.65	65.049	472.08	278.91	.41370

#1	.00267	117.46	.00142	-0.01713	-0.00297	-0.00176	.01720	3.9502
#2	.00393	117.88	.00040	-0.00750	-0.00143	.00447	.00269	3.9830
#3	.00428	116.91	.00149	.00086	-0.00579	-0.00607	-0.00686	3.9667

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126102 Acquired: 2/27/2017 17:33:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00133	.10206	-.00241	-.00168	.00161	.00197	.16894
Stddev	.00039	.00055	.00118	.00110	.00066	.00031	.39463
%RSD	29.119	.53940	48.890	65.029	40.856	15.761	233.59

#1	.00099	.10263	-.00377	-.00081	.00085	.00233	.17835
#2	.00126	.10200	-.00169	-.00291	.00195	.00179	-.23031
#3	.00175	.10154	-.00177	-.00133	.00202	.00179	.55877

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5255.0	71497.	9359.4
Stddev	13.2	147.	14.3
%RSD	.25080	.20546	.15277

#1	5250.1	71543.	9361.0
#2	5245.0	71333.	9344.4
#3	5269.9	71616.	9372.8

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126103 Acquired: 2/27/2017 17:37:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00157	.00357	-.00359	-.00002	.00045	-.00010	.02013
Stddev	.00189	.00374	.00137	.00347	.00007	.00007	.03166
%RSD	120.00	104.80	38.089	15297.	16.715	78.111	157.32

#1	-.00347	.00317	-.00305	.00273	.00042	-.00005	.04203
#2	-.00156	.00005	-.00257	.00112	.00053	-.00018	.03453
#3	.00031	.00750	-.00514	-.00392	.00039	-.00006	-.01618

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00025	.00013	-.00002	.00019	-.00275	.06252	.00144
Stddev	.00030	.00043	.00029	.00121	.01244	.01342	.00437
%RSD	120.77	336.89	1189.5	649.15	452.46	21.470	302.22

#1	-.00006	.00061	.00029	.00153	-.00533	.05893	-.00216
#2	.00054	-.00003	-.00006	-.00081	-.01370	.05125	.00019
#3	.00028	-.00021	-.00030	-.00016	.01078	.07737	.00630

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.02323	.00178	-.00041	.26977	.00265	-.01000	-.00287
Stddev	.04816	.00141	.00027	.01802	.00146	.00353	.00582
%RSD	207.35	79.065	65.973	6.6812	55.356	35.343	202.92

#1	-.07261	.00341	-.00010	.27465	.00392	-.00596	-.00554
#2	-.02067	.00107	-.00061	.28485	.00298	-.01150	.00381
#3	.02360	.00088	-.00051	.24981	.00104	-.01254	-.00687

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126103 Acquired: 2/27/2017 17:37:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00424	F -0.01233	.04068	.00103	.00089	-0.00148	-0.00349
Stddev	.00325	.00552	.00066	.00082	.00029	.00207	.00529
%RSD	76.798	44.764	1.6115	79.203	32.508	140.23	151.82

#1	-0.00731	-0.01800	.04142	.00159	.00057	-0.00337	-0.00746
#2	-0.00083	-0.01200	.04017	.00009	.00096	.00074	-0.00552
#3	-0.00456	-0.00698	.04046	.00142	.00113	-0.00181	.00252

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-0.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00015	.00138	.03854
Stddev	.00031	.00027	.14199
%RSD	207.91	19.757	368.40

#1	-0.00016	.00155	.15834
#2	-0.00044	.00107	.07558
#3	.00017	.00152	-1.1829

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5358.0	74788.	9490.2
Stddev	11.6	289.	15.4
%RSD	.21585	.38601	.16198

#1	5360.1	74892.	9473.7
#2	5368.4	74462.	9492.8
#3	5345.5	75011.	9504.2

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126104 Acquired: 2/27/2017 17:41:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00352	.04267	.00954	.08697	26.162	.00035	F 1168.5
Stddev	.00184	.00637	.00202	.00482	.427	.00006	17.1
%RSD	52.175	14.940	21.201	5.5464	1.6307	16.915	1.4596

#1	-.00341	.04137	.00819	.09248	26.052	.00039	1157.0
#2	-.00174	.03704	.00856	.08493	26.633	.00038	1188.1
#3	-.00540	.04959	.01186	.08351	25.801	.00028	1160.4

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00602	.00471	.00226	.01866	13.322	33.603	.48332
Stddev	.00020	.00072	.00144	.00104	.121	.276	.00441
%RSD	3.2551	15.244	63.686	5.5765	.90716	.82176	.91265

#1	.00604	.00541	.00193	.01858	13.230	33.295	.47827
#2	.00620	.00397	.00102	.01766	13.459	33.687	.48639
#3	.00581	.00474	.00384	.01974	13.276	33.828	.48531

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	296.73	8.2908	.00417	F 442.02	-.00555	.03669	.00350
Stddev	1.17	.0195	.00029	8.12	.00028	.00820	.00838
%RSD	.39391	.23565	6.9069	1.8361	5.1039	22.351	239.05

#1	295.80	8.2699	.00449	449.68	-.00587	.04612	.00418
#2	298.04	8.3086	.00395	442.86	-.00537	.03127	.01153
#3	296.34	8.2939	.00405	433.52	-.00540	.03267	-.00519

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126104 Acquired: 2/27/2017 17:41:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02225	F -.05193	4.3696	.00170	F 61.187	F -.11047	-.00647
Stddev	.00936	.00755	.0148	.00308	.348	.00461	.00465
%RSD	42.072	14.535	.33817	181.80	.56808	4.1703	71.877

#1	-.01617	-.06063	4.3811	.00442	61.143	-.11030	-.01184
#2	-.03303	-.04798	4.3748	.00233	60.864	-.11516	-.00364
#3	-.01755	-.04717	4.3529	-.00165	61.555	-.10595	-.00393

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00092	.00200	F -.82991
Stddev	.00072	.00057	.13832
%RSD	78.032	28.659	16.667

#1	.00099	.00153	-.73886
#2	.00017	.00264	-.98908
#3	.00160	.00184	-.76179

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4199.5	57397.	8493.2
Stddev	3.6	203.	42.5
%RSD	.08554	.35352	.49987

#1	4196.0	57180.	8477.0
#2	4199.3	57582.	8461.2
#3	4203.2	57429.	8541.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105 Acquired: 2/27/2017 17:45:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00277	.03978	.01754	.07979	2.8800	.00018	F 1067.3
Stddev	.00175	.00553	.00378	.00211	.0071	.00007	10.5
%RSD	63.200	13.913	21.576	2.6405	.24670	40.556	.98515

#1	-0.00299	.03347	.01861	.07769	2.8843	.00020	1055.6
#2	-0.00440	.04202	.01334	.07978	2.8839	.00010	1076.0
#3	-0.00092	.04384	.02068	.08190	2.8718	.00025	1070.3

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00326	.00086	-0.00043	.01479	5.1250	228.13	1.2655
Stddev	.00017	.00025	.00043	.00165	.0077	.80	.0045
%RSD	5.3348	28.978	100.49	11.157	.15091	.35168	.35603

#1	.00306	.00067	-0.00008	.01412	5.1171	228.94	1.2612
#2	.00333	.00114	-0.00092	.01358	5.1326	228.12	1.2702
#3	.00339	.00075	-0.00029	.01667	5.1252	227.34	1.2651

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.753	2.1211	.00700	70.149	.06616	.05126	-0.0022
Stddev	.107	.0040	.00033	.245	.00256	.01166	.00568
%RSD	.77587	.18947	4.7138	.34934	3.8633	22.749	2531.8

#1	13.834	2.1169	.00692	70.404	.06850	.04027	-.00484
#2	13.632	2.1250	.00736	70.128	.06343	.06349	.00612
#3	13.791	2.1215	.00671	69.915	.06656	.05002	-.00196

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105 Acquired: 2/27/2017 17:45:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-01

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02392	F -.03302	2.5217	.00181	5.8659	F -.09265	F -.00949
Stddev	.00330	.01328	.0089	.00158	.0095	.00174	.00334
%RSD	13.806	40.205	.35367	87.348	.16266	1.8807	35.182

#1	-.02442	-.02378	2.5207	.00011	5.8732	-.09076	-.00757
#2	-.02040	-.02705	2.5311	.00209	5.8694	-.09420	-.00757
#3	-.02695	-.04823	2.5133	.00322	5.8551	-.09297	-.01335

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit	45.000	90.000				36.000	
Low Limit	-.02000	-.01000				-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-.00014	.00058	F -.25160
Stddev	.00110	.00029	.37649
%RSD	778.66	49.720	149.64

#1	-.00084	.00076	-.59833
#2	-.00071	.00073	-.30534
#3	.00113	.00025	.14887

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4639.4	63859.	9146.2
Stddev	10.1	79.	34.2
%RSD	.21708	.12355	.37412

#1	4643.8	63796.	9106.7
#2	4627.9	63948.	9166.7
#3	4646.5	63834.	9165.3

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105MS Acquired: 2/27/2017 17:49:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21059	4.6100	.22792	1.0365	3.4391	.02452	F 1073.9
Stddev	.00030	.0087	.00556	.0024	.0036	.00010	8.8
%RSD	.14464	.18803	2.4384	.22777	.10569	.40802	.81936

#1	.21093	4.6173	.22845	1.0364	3.4361	.02462	1084.0
#2	.21033	4.6004	.23319	1.0389	3.4381	.02442	1067.8
#3	.21052	4.6123	.22211	1.0342	3.4431	.02452	1069.8

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02815	.09483	.24218	.25142	7.0822	255.47	1.8266
Stddev	.00008	.00029	.00104	.00208	.0214	.22	.0038
%RSD	.27167	.30155	.42861	.82552	.30200	.08417	.20980

#1	.02807	.09496	.24099	.25090	7.0896	255.37	1.8225
#2	.02822	.09503	.24261	.24966	7.0990	255.32	1.8271
#3	.02817	.09450	.24292	.25371	7.0581	255.72	1.8301

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	18.446	2.3948	.49786	96.666	.30062	5.1079	.23169
Stddev	.093	.0095	.00104	.088	.00148	.0123	.00181
%RSD	.50312	.39777	.20845	.09146	.49222	.24098	.77913

#1	18.469	2.3985	.49869	96.585	.30226	5.0937	.23351
#2	18.344	2.3840	.49669	96.653	.29937	5.1142	.22990
#3	18.525	2.4019	.49820	96.760	.30024	5.1157	.23166

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105MS Acquired: 2/27/2017 17:49:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-04

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.59836	.16264	5.2608	.46831	6.4821	.40760	.21289
Stddev	.00148	.01218	.0067	.00098	.0054	.00392	.01154
%RSD	.24655	7.4872	.12760	.20971	.08279	.96249	5.4214

#1	.59779	.17107	5.2656	.46877	6.4765	.40318	.22419
#2	.60003	.14868	5.2636	.46718	6.4873	.40895	.20112
#3	.59725	.16816	5.2531	.46898	6.4824	.41067	.21337

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.49625	.46770	F -.07611
Stddev	.00150	.00036	.24336
%RSD	.30166	.07657	319.73

#1	.49619	.46733	-.26770
#2	.49478	.46805	-.15834
#3	.49777	.46772	.19771

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4640.1	63759.	9199.3
Stddev	10.0	67.	41.9
%RSD	.21506	.10559	.45511

#1	4651.4	63820.	9181.2
#2	4632.8	63771.	9247.2
#3	4635.9	63687.	9169.5

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105MSD Acquired: 2/27/2017 17:53:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21163	4.6432	.22844	1.0443	3.4718	.02469	F 1017.8
Stddev	.00125	.0153	.00478	.0037	.0108	.00004	7.9
%RSD	.59146	.33023	2.0934	.35072	.31141	.16172	.77234

#1	.21081	4.6560	.22928	1.0465	3.4813	.02465	1025.8
#2	.21102	4.6262	.23275	1.0464	3.4600	.02473	1010.1
#3	.21307	4.6473	.22330	1.0401	3.4741	.02470	1017.6

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02871	.09483	.24210	.25416	7.1671	256.30	1.8341
Stddev	.00042	.00032	.00031	.00116	.0115	1.17	.0095
%RSD	1.4653	.33979	.12825	.45729	.15980	.45696	.51707

#1	.02831	.09509	.24188	.25398	7.1790	256.95	1.8450
#2	.02867	.09492	.24196	.25309	7.1561	254.95	1.8295
#3	.02915	.09447	.24245	.25540	7.1663	257.00	1.8278

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	18.706	2.4233	.49963	96.673	.30164	5.1893	.23623
Stddev	.178	.0085	.00103	.376	.00248	.0049	.00367
%RSD	.95293	.34914	.20605	.38884	.82223	.09420	1.5530

#1	18.861	2.4329	.50082	96.724	.30282	5.1931	.23858
#2	18.511	2.4170	.49907	96.274	.30330	5.1909	.23200
#3	18.744	2.4199	.49901	97.021	.29879	5.1838	.23811

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126105MSD Acquired: 2/27/2017 17:53:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-05

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.59612	.16793	5.3146	.46997	6.5569	.40179	.20924
Stddev	.01041	.02054	.0135	.00203	.0204	.00358	.01115
%RSD	1.7467	12.230	.25374	.43178	.31162	.89185	5.3269

#1	.59168	.16867	5.3140	.46808	6.5715	.40300	.19901
#2	.60802	.14703	5.3284	.47211	6.5336	.40461	.22112
#3	.58867	.18808	5.3014	.46971	6.5656	.39776	.20759

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.49842	.47265	F -.19623
Stddev	.00125	.00067	.29102
%RSD	.25057	.14083	148.31

#1	.49844	.47319	-.08080
#2	.49716	.47286	.01937
#3	.49966	.47191	-.52726

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4656.9	64197.	9336.7
Stddev	9.0	194.	76.9
%RSD	.19272	.30272	.82314

#1	4646.8	64318.	9315.7
#2	4663.9	64300.	9421.9
#3	4660.1	63973.	9272.6

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 17:57:30 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41125	10.470	.41187	.51519	1.0346	.05116	10.364	.05115
Stddev	.00396	.023	.00403	.00331	.0039	.00007	.030	.00012
%RSD	.96334	.21821	.97795	.64259	.37466	.13218	.28936	.23495

#1	.40774	10.456	.41646	.51150	1.0320	.05120	10.397	.05111
#2	.41046	10.457	.41023	.51789	1.0327	.05119	10.337	.05106
#3	.41555	10.496	.40892	.51618	1.0390	.05108	10.359	.05129

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20622	.51621	.51857	4.1028	52.443	1.0408	10.385	.51034
Stddev	.00103	.00183	.00224	.0297	.324	.0046	.085	.00114
%RSD	.50154	.35448	.43251	.72325	.61722	.44070	.82066	.22363

#1	.20720	.51507	.51981	4.0705	52.178	1.0416	10.299	.50937
#2	.20633	.51524	.51598	4.1089	52.348	1.0359	10.385	.51005
#3	.20514	.51832	.51993	4.1289	52.804	1.0450	10.470	.51160

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0227	51.608	.51795	10.230	.52388	1.2277	.40837	5.1207
Stddev	.0017	.337	.00109	.022	.00422	.0059	.01334	.0119
%RSD	.16986	.65391	.21073	.21385	.80524	.48147	3.2656	.23316

#1	1.0246	51.334	.51921	10.245	.51952	1.2323	.39988	5.1315
#2	1.0225	51.505	.51721	10.240	.52419	1.2298	.42374	5.1225
#3	1.0211	51.985	.51744	10.205	.52794	1.2210	.40149	5.1079

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 17:57:30 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0346	1.0333	1.0200	.52840	1.0305	1.0379	1.0159
Stddev	.0044	.0020	.0060	.00865	.0021	.0027	.1111
%RSD	.42277	.19191	.58713	1.6364	.20358	.26210	10.935

#1	1.0395	1.0323	1.0150	.52501	1.0292	1.0410	1.0465
#2	1.0311	1.0321	1.0183	.53822	1.0294	1.0365	1.1084
#3	1.0332	1.0356	1.0266	.52195	1.0329	1.0362	.89270

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 Value
 Range

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5260.5	71807.	9366.7
Stddev	10.8	558.	83.7
%RSD	.20470	.77667	.89369

#1	5266.9	72427.	9453.4
#2	5266.5	71648.	9360.4
#3	5248.1	71346.	9286.4

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 18:01:05 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0155	-0.0059	.00333	.00143	.00038	-0.0002	.00306
Stddev	.00113	.00293	.00415	.00293	.00012	.00002	.01998
%RSD	72.702	494.32	124.53	205.74	30.564	117.17	652.05

#1	-0.0031	-0.0105	.00543	.00193	.00025	-0.0004	.02535
#2	-0.0251	.00254	-0.0145	-0.0173	.00047	-0.0002	-.01327
#3	-0.0184	-0.0327	.00602	.00407	.00043	.00000	-.00288

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0014	.00023	.00002	-0.0027	-0.00385	.38536	.00273
Stddev	.00027	.00025	.00047	.00063	.01396	.10914	.00166
%RSD	193.22	111.83	2050.6	233.87	362.85	28.321	60.740

#1	-0.0023	.00021	.00054	-0.0100	.00114	.27618	.00435
#2	.00017	.00049	-0.0008	.00012	-.01961	.38544	.00282
#3	-0.0035	-0.0002	-0.0039	.00007	.00694	.49445	.00103

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.07531	.00017	-0.0013	.11770	.00170	.00203	-0.00079
Stddev	.05372	.00200	.00020	.00966	.00119	.00489	.00390
%RSD	71.338	1160.9	152.40	8.2062	70.106	240.97	493.05

#1	-.13038	.00243	.00007	.12219	.00033	-0.00343	-.00292
#2	-.07251	-0.00138	-0.00034	.10661	.00245	.00351	.00371
#3	-.02304	-0.00054	-0.00013	.12430	.00233	.00600	-.00316

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 18:01:05 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00842	-0.00930	.00125	-0.00003	.00016	-0.00504	-0.00400
Stddev	.00338	.00465	.00280	.00097	.00009	.00346	.00485
%RSD	40.105	49.976	223.30	3537.0	57.074	68.569	121.28

#1	-0.00730	-0.01112	.00217	.00013	.00023	-0.00118	-0.00906
#2	-0.01222	-0.00402	-0.00189	-0.00107	.00020	-0.00784	-0.00354
#3	-0.00574	-0.01277	.00348	.00085	.00006	-0.00610	.00061

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00008	-0.00072	F .04650
Stddev	.00020	.00024	.20558
%RSD	257.87	32.967	442.10

#1	.00030	-0.00086	.16823
#2	.00001	-0.00086	.16213
#3	-0.00008	-0.00045	-.19086

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5279.8	73058.	9089.6
Stddev	10.7	202.	32.5
%RSD	.20198	.27583	.35777

#1	5277.4	73072.	9093.5
#2	5270.5	73252.	9120.0
#3	5291.4	72849.	9055.3

Approved: February 28, 2017

K. K. Beck

Sample Name: PBW 8A Acquired: 2/27/2017 18:23:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00297	-0.00010	-0.00512	-0.00156	-0.00008	-0.00000	.00913
Stddev	.00114	.00174	.00128	.00063	.00040	.00003	.01010
%RSD	38.514	1794.7	25.030	40.251	479.14	708.23	110.62

#1	-0.00206	-0.00205	-0.00600	-0.00220	.00020	.00003	.01583
#2	-0.00260	.00128	-0.00572	-0.00095	.00008	-0.00002	.01404
#3	-0.00425	.00048	-0.00365	-0.00152	-0.00054	-0.00002	-0.00249

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00027	.00006	-0.00097	-0.00098	.00751	.14442	.00049
Stddev	.00012	.00017	.00072	.00067	.02028	.03110	.00159
%RSD	45.848	291.87	73.624	68.928	270.00	21.535	325.96

#1	.00029	.00010	-0.00138	-0.00161	-.01512	.16346	.00091
#2	.00014	-0.00013	-0.00015	-0.00106	.01360	.10853	.00183
#3	.00038	.00021	-0.00139	-0.00027	.02405	.16127	-0.00127

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.02606	-0.00068	-0.00016	.07072	.00165	-0.01042	F -.00540
Stddev	.00771	.00119	.00047	.00473	.00053	.00673	.00127
%RSD	29.579	174.70	303.80	6.6869	31.858	64.536	23.453

#1	-0.03439	-0.00188	.00035	.06939	.00187	-0.01684	-0.00685
#2	-0.01919	-0.00067	-0.00024	.06680	.00105	-0.00342	-0.00486
#3	-0.02460	.00050	-0.00058	.07597	.00203	-0.01100	-0.00450

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							225.00
Low Limit							-0.00500

Approved: February 28, 2017

K. K. Beck

Sample Name: PBW 8A Acquired: 2/27/2017 18:23:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-02

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00631	-0.00440	-0.00071	-0.00058	.00013	-0.00209	-0.00121
Stddev	.00466	.00271	.00415	.00081	.00013	.00454	.00503
%RSD	73.866	61.523	581.24	140.93	97.090	217.37	414.88

#1	-0.00204	-0.00234	-0.00005	-0.00144	.00002	.00181	.00383
#2	-0.00561	-0.00340	.00307	-0.00046	.00010	-0.00100	-0.00622
#3	-0.01129	-0.00747	-0.00516	.00017	.00027	-0.00707	-0.00125

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00054	.00025	.08931
Stddev	.00077	.00018	.14280
%RSD	142.78	71.265	159.89

#1	-0.00009	.00046	.22420
#2	-0.00010	.00013	-.06027
#3	-0.00143	.00017	.10401

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5319.3	73736.	9206.8
Stddev	16.4	267.	67.7
%RSD	.30846	.36236	.73498

#1	5303.4	73851.	9284.9
#2	5318.2	73926.	9169.3
#3	5336.2	73430.	9166.1

Approved: February 28, 2017

K. K. Beck

Sample Name: LCSW 8A Acquired: 2/27/2017 18:27:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19856	5.1820	.19524	.92430	.50390	.02454	5.0167	.02486
Stddev	.00073	.0150	.00060	.00101	.00085	.00010	.0245	.00025
%RSD	.36883	.29010	.30675	.10937	.16780	.40935	.48865	1.0073

#1	.19844	5.1711	.19461	.92416	.50293	.02443	4.9917	.02502
#2	.19935	5.1991	.19532	.92337	.50437	.02456	5.0407	.02457
#3	.19790	5.1757	.19580	.92538	.50441	.02462	5.0177	.02498

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10132	.25007	.24990	1.9968	25.387	.51408	5.0185	.24680
Stddev	.00037	.00096	.00028	.0129	.165	.00351	.0470	.00146
%RSD	.36812	.38520	.11181	.64688	.64928	.68324	.93658	.58958

#1	.10097	.24957	.25020	1.9945	25.304	.51325	5.0541	.24573
#2	.10172	.25118	.24986	1.9853	25.280	.51794	4.9652	.24622
#3	.10127	.24946	.24965	2.0108	25.577	.51106	5.0362	.24846

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50083	25.382	.25451	4.8441	.25315	.58808	.18876	2.4777
Stddev	.00098	.084	.00159	.0073	.00399	.00970	.00371	.0081
%RSD	.19516	.32957	.62309	.15034	1.5744	1.6494	1.9658	.32607

#1	.50194	25.398	.25501	4.8524	.25646	.59737	.18476	2.4855
#2	.50010	25.292	.25578	4.8387	.25427	.58885	.19209	2.4694
#3	.50045	25.457	.25273	4.8412	.24872	.57802	.18944	2.4783

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: LCSW 8A Acquired: 2/27/2017 18:27:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-03

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50657	.50225	.49658	.25158	.50066	.50000	.45459
Stddev	.00096	.00213	.00202	.00113	.00042	.00046	.25155
%RSD	.18881	.42356	.40655	.44894	.08436	.09263	55.336
#1	.50669	.49980	.49455	.25288	.50021	.50053	.22864
#2	.50745	.50367	.49859	.25099	.50105	.49971	.40949
#3	.50555	.50328	.49660	.25086	.50070	.49975	.72564

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5282.2	71580.	8973.2
Stddev	6.8	654.	118.3
%RSD	.12800	.91361	1.3178
#1	5275.3	71178.	9077.7
#2	5282.4	71227.	8997.1
#3	5288.8	72334.	8844.8

Approved: February 28, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/27/2017 18:30:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG603954-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00067	.00582	-.00640	.00354	-.00020	-.00002	.00164
Stddev	.00047	.00593	.00202	.00136	.00044	.00003	.01334
%RSD	71.087	101.86	31.557	38.352	222.89	198.53	816.06

#1	-.00120	.00541	-.00409	.00379	.00030	-.00003	.01442
#2	-.00029	.01195	-.00728	.00475	-.00052	.00002	.00269
#3	-.00051	.00011	-.00783	.00207	-.00037	-.00004	-.01221

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00015	.00002	.00014	.00078	.00536	.30292	-.00311
Stddev	.00016	.00036	.00010	.00142	.01869	.02148	.00096
%RSD	105.53	2255.6	71.871	181.89	348.92	7.0914	31.067

#1	.00033	-.00029	.00026	.00018	-.01590	.27940	-.00263
#2	.00007	.00042	.00007	.00241	.01276	.32151	-.00247
#3	.00005	-.00008	.00010	-.00024	.01921	.30786	-.00422

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.02199	-.00126	.00009	139.85	.00271	-.00658	-.00143
Stddev	.05422	.00150	.00026	.27	.00092	.01262	.00360
%RSD	246.58	119.43	285.68	.19292	33.861	191.92	252.15

#1	-.08454	-.00094	.00033	140.13	.00369	.00606	-.00547
#2	.01156	.00006	-.00018	139.59	.00187	-.01918	.00146
#3	.00702	-.00290	.00012	139.83	.00257	-.00661	-.00027

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/27/2017 18:30:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG603954-01

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00262	F -0.01591	.00556	-0.00037	.00008	-0.00478	-0.00805
Stddev	.00154	.00352	.00274	.00076	.00027	.00195	.00566
%RSD	58.959	22.150	49.286	203.27	340.85	40.793	70.297

#1	-0.00159	-0.01887	.00321	.00019	-0.00023	-0.00463	-0.01347
#2	-0.00187	-0.01686	.00491	-0.00123	.00020	-0.00681	-0.00218
#3	-0.00439	-0.01201	.00857	-0.00008	.00027	-0.00292	-0.00850

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-0.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00009	.00309	.08972
Stddev	.00036	.00004	.22241
%RSD	401.62	1.3576	247.89

#1	-0.00032	.00306	-.12754
#2	.00021	.00308	.31695
#3	.00038	.00314	.07976

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5122.1	70394.	9173.5
Stddev	18.9	226.	51.1
%RSD	.36873	.32062	.55728

#1	5142.2	70647.	9115.0
#2	5119.3	70320.	9196.1
#3	5104.7	70214.	9209.4

Approved: February 28, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/27/2017 18:34:37 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG603954-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00251	.00442	-.00309	-.00035	.00188	-.00008	.15723
Stddev	.00074	.00360	.00308	.00109	.00008	.00010	.00533
%RSD	29.702	81.564	99.545	307.91	4.3363	117.36	3.3924

#1	-.00336	.00118	.00033	-.00042	.00182	.00000	.15296
#2	-.00205	.00829	-.00565	-.00140	.00185	-.00006	.15551
#3	-.00211	.00377	-.00396	.00077	.00197	-.00019	.16321

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00035	-.00035	-.00041	-.00114	.00646	.15298	.00163
Stddev	.00038	.00060	.00073	.00073	.00720	.06062	.00155
%RSD	107.92	170.64	176.65	63.974	111.52	39.624	95.268

#1	.00007	-.00091	-.00092	-.00066	-.00078	.11409	.00081
#2	.00078	.00028	-.00073	-.00198	.01362	.22283	.00066
#3	.00019	-.00041	.00042	-.00079	.00653	.12203	.00343

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01253	.00206	.00023	142.03	.00222	-.01037	-.00392
Stddev	.03093	.00084	.00091	.30	.00170	.00833	.00150
%RSD	246.78	40.654	388.55	.21355	76.396	80.346	38.189

#1	-.02120	.00259	.00001	141.74	.00089	-.00739	-.00428
#2	.03955	.00109	-.00054	142.02	.00164	-.01978	-.00520
#3	.01924	.00249	.00123	142.34	.00414	-.00393	-.00228

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/27/2017 18:34:37 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG603954-02

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00318	-0.00764	.00227	.00021	.00203	-0.00443	-0.00865
Stddev	.00128	.00056	.00235	.00017	.00020	.00452	.00679
%RSD	40.183	7.3339	103.58	79.249	10.022	101.94	78.504

#1	-0.00407	-0.00806	-0.00038	.00002	.00226	-0.00483	-0.00573
#2	-0.00172	-0.00784	.00413	.00031	.00197	.00027	-0.01641
#3	-0.00376	-0.00700	.00306	.00030	.00186	-0.00874	-0.00381

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00051	.02026	F -.10169
Stddev	.00047	.00022	.25903
%RSD	92.200	1.0897	254.73

#1	-0.00001	.02043	.13031
#2	.00091	.02033	-.38118
#3	.00064	.02001	-.05420

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5187.5	70855.	9038.2
Stddev	28.9	68.	18.1
%RSD	.55749	.09619	.20021

#1	5154.4	70785.	9017.5
#2	5200.0	70860.	9051.1
#3	5208.0	70921.	9046.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119701 Acquired: 2/27/2017 18:38:27 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00094	.01476	-.00587	.08354	.03931	-.00008	1.5050
Stddev	.00131	.00639	.00240	.00072	.00048	.00004	.0488
%RSD	139.46	43.308	40.854	.85693	1.2335	47.931	3.2426

#1	-.00169	.01115	-.00458	.08364	.03892	-.00006	1.4562
#2	-.00169	.01099	-.00864	.08420	.03985	-.00005	1.5538
#3	.00057	.02214	-.00439	.08278	.03916	-.00012	1.5050

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	.00494	.00227	.68708	.76354	.51226	.00250
Stddev	.00012	.00041	.00050	.00196	.01236	.03623	.00313
%RSD	28.354	8.3876	21.807	.28515	1.6188	7.0733	125.20

#1	.00053	.00493	.00238	.68591	.75711	.47045	.00607
#2	.00029	.00452	.00173	.68599	.77779	.53188	.00125
#3	.00047	.00535	.00271	.68934	.75572	.53445	.00019

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.15342	5.3889	-.00003	131.35	.02758	F -.23519	-.00257
Stddev	.02964	.0153	.00049	.22	.00137	.00591	.00336
%RSD	19.321	.28472	1545.9	.16463	4.9515	2.5118	130.91

#1	.18442	5.3719	-.00034	131.16	.02858	-.22865	-.00641
#2	.12535	5.3932	-.00028	131.29	.02813	-.24015	-.00112
#3	.15049	5.4017	.00053	131.58	.02602	-.23676	-.00017

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit						180.00	
Low Limit						-.10000	

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702119701 Acquired: 2/27/2017 18:38:27 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00328	F -0.01166	.41476	.00124	.00284	-0.00377	-0.00221
Stddev	.00631	.00754	.00223	.00043	.00003	.00186	.00576
%RSD	192.32	64.719	.53689	34.763	.94358	49.507	260.15

#1	.00207	-.01496	.41731	.00093	.00281	-.00219	-.00804
#2	-.00167	-.01699	.41377	.00173	.00284	-.00328	.00347
#3	-.01024	-.00303	.41320	.00105	.00287	-.00583	-.00207

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00070	.52639	-.01806
Stddev	.00085	.00031	.10034
%RSD	121.77	.05981	555.68

#1	.00078	.52659	.09738
#2	.00151	.52602	-.08442
#3	-.00019	.52655	-.06713

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5285.4	72451.	9542.8
Stddev	14.8	112.	55.9
%RSD	.28067	.15514	.58530

#1	5268.8	72580.	9574.8
#2	5297.4	72391.	9575.2
#3	5290.1	72381.	9478.3

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702120001 Acquired: 2/27/2017 18:42:12 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00074	.30340	-0.00234	.01569	.50989	-0.00010	22.918
Stddev	.00192	.00860	.00586	.00295	.00030	.00002	.108
%RSD	258.86	2.8334	250.26	18.834	.05794	17.114	.47020

#1	.00041	.29349	-.00216	.01693	.51016	-.00010	22.794
#2	.00032	.30880	-.00828	.01231	.50994	-.00008	22.981
#3	-.00295	.30792	.00342	.01781	.50958	-.00011	22.981

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00082	.31021	-0.00030	.00424	.04588	.49640	.00343
Stddev	.00025	.00054	.00010	.00182	.01602	.05225	.00313
%RSD	30.121	.17561	34.456	42.929	34.910	10.526	91.032

#1	.00064	.31009	-.00039	.00632	.06212	.48269	.00185
#2	.00071	.30974	-.00032	.00344	.04543	.55414	.00704
#3	.00110	.31081	-.00019	.00296	.03009	.45237	.00142

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.3994	1.1900	.00317	10.751	.00167	2.4797	.00007
Stddev	.0094	.0011	.00051	.050	.00267	.0034	.00121
%RSD	.27757	.09473	16.191	.46228	159.49	.13850	1803.2

#1	3.4032	1.1889	.00374	10.754	.00335	2.4825	-.00006
#2	3.4063	1.1901	.00275	10.799	.00307	2.4759	.00134
#3	3.3887	1.1912	.00303	10.700	-.00140	2.4808	-.00108

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702120001 Acquired: 2/27/2017 18:42:12 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02045	.00549	.79700	.00381	.68261	.00960	-.00907
Stddev	.00494	.00315	.00233	.00075	.00031	.00233	.00792
%RSD	24.139	57.394	.29296	19.718	.04512	24.266	87.242

#1	-.01661	.00504	.79488	.00412	.68239	.00769	-.00174
#2	-.01871	.00259	.79662	.00296	.68296	.01220	-.01747
#3	-.02601	.00884	.79950	.00436	.68248	.00892	-.00801

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	45.000						
Low Limit	-.02000						

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00001	37.904	9.6703
Stddev	.00068	.162	.2412
%RSD	4575.0	.42788	2.4940

#1	.00039	37.759	9.5037
#2	.00043	37.875	9.5603
#3	-.00077	38.079	9.9469

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5520.5	76724.	9920.3
Stddev	14.8	190.	32.0
%RSD	.26805	.24820	.32246

#1	5533.2	76926.	9909.6
#2	5524.0	76548.	9956.2
#3	5504.2	76698.	9894.9

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702120002 Acquired: 2/27/2017 18:45:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0024	1.4520	.00770	.02565	.52515	-0.00001	131.44
Stddev	.00070	.0057	.00252	.00060	.00209	.00003	.46
%RSD	286.63	.39226	32.779	2.3324	.39809	504.62	.35161

#1	-0.0024	1.4467	.00825	.02500	.52486	-0.00003	131.58
#2	.00045	1.4580	.00990	.02575	.52322	.00002	130.92
#3	-0.00095	1.4513	.00494	.02619	.52737	-0.00001	131.82

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00201	.67146	.00190	.00142	.11836	.71384	.00878
Stddev	.00018	.00038	.00031	.00253	.01471	.03371	.00298
%RSD	8.9296	.05628	16.465	178.20	12.426	4.7217	33.888

#1	.00216	.67173	.00198	-0.00007	.10145	.69058	.01168
#2	.00206	.67162	.00155	-0.00001	.12812	.69846	.00892
#3	.00181	.67103	.00216	.00434	.12553	.75250	.00574

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.7868	1.6411	.00392	6.1797	.00172	27.746	-.00201
Stddev	.0114	.0088	.00018	.0168	.00049	.029	.00374
%RSD	.16775	.53633	4.6475	.27242	28.462	.10396	185.81

#1	6.7882	1.6490	.00377	6.1791	.00144	27.778	-.00412
#2	6.7747	1.6316	.00412	6.1631	.00228	27.737	-.00423
#3	6.7974	1.6429	.00386	6.1968	.00143	27.723	.00231

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702120002 Acquired: 2/27/2017 18:45:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02871	.01004	.97200	.00442	1.3687	.00816	-.01733
Stddev	.00265	.00261	.00726	.00072	.0024	.00259	.00606
%RSD	9.2400	26.028	.74668	16.197	.17500	31.741	34.981

#1	-.03086	.01221	.97687	.00377	1.3707	.00568	-.02375
#2	-.02952	.00714	.97547	.00519	1.3661	.01084	-.01654
#3	-.02574	.01078	.96366	.00429	1.3694	.00794	-.01170

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	45.000						
Low Limit	-.02000						

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00088	F 107.79	2.3572
Stddev	.00080	.23	.0582
%RSD	89.971	.21166	2.4668

#1	.00127	108.05	2.3956
#2	-.00003	107.68	2.2903
#3	.00142	107.64	2.3857

Check ?	Chk Pass	Chk Fail	Chk Pass
High Limit		45.000	
Low Limit		-.01000	

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5355.3	74661.	9648.1
Stddev	17.4	322.	106.8
%RSD	.32563	.43158	1.1069

#1	5343.2	75033.	9628.8
#2	5375.3	74494.	9763.3
#3	5347.3	74457.	9552.3

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702122801 Acquired: 2/27/2017 18:49:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00200	.04499	-0.00300	.03733	.00198	-0.00003	53.723	.00028
Stddev	.00169	.00871	.00495	.00211	.00037	.00002	.089	.00029
%RSD	84.521	19.351	164.70	5.6473	18.743	62.118	.16523	102.52

#1	-0.00150	.03626	.00075	.03489	.00163	-0.00005	53.629	.00013
#2	-0.00389	.05367	-0.00115	.03852	.00195	-0.00004	53.805	.00010
#3	-0.00062	.04502	-0.00861	.03857	.00237	-0.00001	53.736	.00062

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02125	.09340	.08745	.29613	13.153	.00035	1.6280	1.4518
Stddev	.00035	.00146	.00087	.00575	.109	.00402	.0142	.0060
%RSD	1.6413	1.5591	.99102	1.9430	.82525	1158.8	.87159	.41486

#1	.02092	.09508	.08645	.29901	13.036	-0.00393	1.6302	1.4479
#2	.02161	.09259	.08793	.29987	13.170	.00405	1.6128	1.4488
#3	.02123	.09253	.08797	.28950	13.251	.00092	1.6410	1.4587

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00032	167.20	.13067	-0.03381	.00083	-0.00511	-0.00732	1.1765
Stddev	.00065	.95	.00066	.00524	.00146	.00670	.00484	.0014
%RSD	205.73	.56820	.50338	15.493	175.22	131.29	66.108	.12355

#1	.00043	166.56	.13035	-0.03844	.00144	-0.01201	-0.00349	1.1775
#2	-0.00062	166.74	.13143	-0.02813	-0.00083	-0.00467	-0.00570	1.1771
#3	-0.00076	168.29	.13025	-0.03485	.00190	.00137	-0.01276	1.1748

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702122801 Acquired: 2/27/2017 18:49:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00007	.13523	-0.00454	-0.00224	-0.00074	5.8707	-0.02790
Stddev	.00088	.00062	.00158	.00173	.00026	.0136	.06794
%RSD	1333.9	.46192	34.851	77.131	35.538	.23094	243.51

#1	.00051	.13453	-0.00616	-0.00116	-0.00052	5.8601	-.10298
#2	.00037	.13540	-0.00300	-0.00424	-0.00069	5.8660	.02936
#3	-0.00108	.13574	-0.00447	-0.00133	-0.00103	5.8860	-0.01009

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5222.7	71049.	9220.7
Stddev	19.9	248.	65.7
%RSD	.38065	.34916	.71280

#1	5212.6	70909.	9222.7
#2	5245.6	70902.	9285.4
#3	5210.0	71335.	9154.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702122801PS Acquired: 2/27/2017 18:53:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604317-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19999	4.9804	.19664	.99437	.50429	.02499	52.541	.02557
Stddev	.00289	.0032	.00238	.00249	.00076	.00010	.148	.00019
%RSD	1.4442	.06332	1.2116	.25018	.15142	.39991	.28222	.74152

#1	.19666	4.9816	.19864	.99270	.50517	.02489	52.706	.02564
#2	.20154	4.9827	.19400	.99318	.50395	.02500	52.420	.02536
#3	.20177	4.9768	.19728	.99723	.50377	.02509	52.496	.02572

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.11878	.33068	.32733	2.2110	37.359	.51048	6.4149	1.5455
Stddev	.00042	.00216	.00299	.0050	.166	.00239	.0342	.0065
%RSD	.35338	.65244	.91355	.22400	.44340	.46824	.53343	.42200

#1	.11857	.32863	.32467	2.2125	37.199	.50802	6.4232	1.5530
#2	.11926	.33293	.33057	2.2054	37.530	.51280	6.3773	1.5426
#3	.11851	.33049	.32676	2.2150	37.348	.51062	6.4443	1.5409

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50315	172.95	.36612	5.0714	.24538	.58542	.19027	3.5630
Stddev	.00020	.67	.00100	.0036	.00575	.00161	.00605	.0063
%RSD	.03962	.38768	.27441	.07015	2.3443	.27455	3.1802	.17631

#1	.50320	172.33	.36536	5.0703	.24100	.58356	.18969	3.5565
#2	.50331	173.66	.36726	5.0685	.24324	.58623	.19659	3.5634
#3	.50293	172.87	.36575	5.0753	.25189	.58645	.18453	3.5691

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702122801PS Acquired: 2/27/2017 18:53:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604317-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49706	.62100	.48943	.24113	.50446	5.7588	.45204
Stddev	.00091	.00079	.00179	.00552	.00069	.0062	.30981
%RSD	.18365	.12654	.36483	2.2895	.13598	.10793	68.537
#1	.49803	.62189	.49141	.24697	.50448	5.7528	.12860
#2	.49693	.62039	.48895	.24044	.50377	5.7652	.74615
#3	.49622	.62072	.48794	.23599	.50514	5.7585	.48136

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5236.1	71349.	9423.0
Stddev	9.1	630.	69.3
%RSD	.17362	.88251	.73541
#1	5235.0	70622.	9496.8
#2	5227.6	71717.	9359.4
#3	5245.7	71709.	9412.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702122801SDL Acquired: 2/27/2017 18:57:03 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604317-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00154	.01751	-0.00380	.00864	.00049	-0.00007	10.938	-0.00007
Stddev	.00135	.00307	.00099	.00188	.00030	.00003	.028	.00038
%RSD	87.583	17.556	25.981	21.723	60.522	40.323	.25894	534.88

#1	-0.00006	.02072	-0.00272	.01073	.00021	-0.00010	10.905	-0.00042
#2	-0.00186	.01459	-0.00402	.00710	.00045	-0.00005	10.956	.00034
#3	-0.00269	.01723	-0.00465	.00809	.00080	-0.00006	10.952	-0.00014

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00454	.01728	.01814	.05816	2.7370	.00318	.29074	.29556
Stddev	.00040	.00061	.00073	.00616	.0683	.00287	.05937	.00187
%RSD	8.8038	3.5049	4.0032	10.595	2.4946	90.290	20.419	.63123

#1	.00453	.01798	.01766	.05841	2.8157	.00293	.35601	.29722
#2	.00415	.01694	.01898	.05187	2.6940	.00045	.27624	.29592
#3	.00495	.01693	.01778	.06419	2.7013	.00617	.23997	.29354

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00027	34.144	.02776	-0.00237	-0.00173	-0.00520	-0.00476	.24185
Stddev	.00033	.057	.00123	.00729	.00230	.00275	.01309	.00341
%RSD	121.83	.16672	4.4342	307.78	132.81	52.923	275.14	1.4110

#1	-0.00036	34.108	.02810	.00321	-0.00406	-0.00483	.00487	.24194
#2	.00009	34.113	.02639	.00031	-0.00166	-0.00812	-.01966	.24522
#3	-0.00055	34.209	.02878	-.01062	.00053	-0.00265	.00052	.23839

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702122801SDL Acquired: 2/27/2017 18:57:03 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604317-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00211	.02717	-0.00373	-0.00176	.00044	1.2247	.07733
Stddev	.00083	.00011	.00449	.00630	.00079	.0026	.18944
%RSD	39.100	.41830	120.42	357.34	178.69	.20799	244.97

#1	.00199	.02704	-0.00185	-0.00812	.00035	1.2251	-.04659
#2	.00136	.02724	-0.00048	-0.00166	.00127	1.2271	.29541
#3	.00300	.02724	-0.00885	.00448	-0.00030	1.2220	-.01682

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5360.7	73759.	9447.5
Stddev	29.2	519.	37.5
%RSD	.54553	.70354	.39730

#1	5392.1	74281.	9490.4
#2	5356.0	73754.	9431.3
#3	5334.2	73243.	9420.8

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 19:00:52 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40876	10.432	.40676	.51291	1.0280	.05063	10.294
Stddev	.00177	.004	.00256	.00312	.0010	.00006	.029
%RSD	.43255	.03836	.62954	.60752	.10216	.10948	.28025

#1	.41080	10.436	.40696	.51327	1.0289	.05069	10.264
#2	.40775	10.431	.40411	.50962	1.0269	.05058	10.322
#3	.40773	10.428	.40922	.51582	1.0282	.05062	10.296

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05114	.20419	.51430	.51347	4.0503	52.042	1.0404
Stddev	.00011	.00043	.00222	.00173	.0219	.082	.0058
%RSD	.20531	.21171	.43075	.33633	.54034	.15695	.55557

#1	.05102	.20386	.51295	.51487	4.0611	52.134	1.0376
#2	.05122	.20402	.51686	.51154	4.0251	52.013	1.0470
#3	.05118	.20468	.51310	.51400	4.0646	51.978	1.0365

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.162	.50789	1.0175	51.707	.51410	10.091	.51864
Stddev	.045	.00520	.0013	.015	.00070	.029	.00331
%RSD	.43889	1.0241	.12949	.02807	.13697	.28587	.63897

#1	10.159	.50405	1.0189	51.694	.51356	10.113	.51723
#2	10.119	.51381	1.0164	51.704	.51385	10.102	.52242
#3	10.208	.50581	1.0170	51.723	.51490	10.059	.51626

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 19:00:52 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2115	.39840	5.0760	1.0258	1.0255	1.0090	.52131
Stddev	.0074	.00370	.0044	.0029	.0015	.0086	.00248
%RSD	.61111	.92746	.08708	.28677	.14947	.85687	.47506

#1	1.2145	.39854	5.0779	1.0251	1.0256	1.0172	.51957
#2	1.2169	.39464	5.0709	1.0232	1.0240	.99999	.52022
#3	1.2030	.40203	5.0791	1.0290	1.0270	1.0099	.52415

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0224	1.0265	F .74284
Stddev	.0016	.0009	.21726
%RSD	.15746	.08714	29.247

#1	1.0222	1.0270	.59375
#2	1.0241	1.0269	.99212
#3	1.0209	1.0254	.64266

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5156.6	69950.	9005.1
Stddev	10.8	49.	55.2
%RSD	.20896	.07017	.61264

#1	5168.7	69964.	9022.7
#2	5153.3	69991.	8943.2
#3	5147.9	69896.	9049.3

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 19:04:27 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00134	-0.00373	-0.00654	.00057	.00036	-0.00000	-0.02734	.00014
Stddev	.00156	.00394	.00663	.00129	.00037	.00004	.01431	.00038
%RSD	116.35	105.55	101.40	227.41	102.19	883.55	52.356	280.92

#1	-0.00161	-0.00406	-0.01419	-0.00091	.00025	.00001	-0.01646	.00055
#2	.00034	-0.00750	-0.00257	.00116	.00077	.00002	-0.04355	-0.00021
#3	-0.00276	.00036	-0.00285	.00145	.00006	-0.00004	-0.02201	.00007

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00012	-0.00068	.00006	-0.00220	.16178	.00177	-0.05162	.00106
Stddev	.00037	.00112	.00104	.00792	.10253	.00274	.05988	.00171
%RSD	320.59	164.39	1669.2	360.11	63.376	154.62	116.01	161.36

#1	-0.00027	.00057	-0.00098	-0.00196	.10369	.00052	-0.09868	-0.00082
#2	.00047	-0.00101	.00110	-0.01024	.28016	-0.00012	-0.07197	.00149
#3	.00015	-0.00161	.00007	.00560	.10148	.00492	.01579	.00251

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00012	.09049	.00116	.00058	-0.00004	-0.00565	-0.01695	-0.00230
Stddev	.00052	.00637	.00176	.00540	.00050	.00786	.00585	.00083
%RSD	446.89	7.0349	152.25	928.21	1178.7	139.06	34.535	36.038

#1	.00007	.08591	-0.00080	.00410	-0.00017	-0.00822	-0.01124	-0.00261
#2	.00029	.08779	.00260	-0.00563	.00051	.00317	-0.02294	-0.00293
#3	-0.00071	.09776	.00167	.00328	-0.00046	-0.01191	-0.01667	-0.00136

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 19:04:27 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0062	-0.0007	-0.00852	-0.00602	.00070	-0.00038	-0.01608
Stddev	.00062	.00022	.00239	.00257	.00037	.00024	.03257
%RSD	100.25	310.80	28.104	42.623	53.331	62.948	202.55

#1	-0.00034	-0.00030	-0.00935	-0.00791	.00110	-0.00018	-0.02683
#2	-0.00019	.00014	-0.00582	-0.00706	.00062	-0.00033	-0.04191
#3	-0.00134	-0.00005	-0.01038	-0.00310	.00037	-0.00065	.02051

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5301.6	72693.	8962.6
Stddev	41.5	232.	45.4
%RSD	.78289	.31950	.50703

#1	5256.7	72754.	8945.8
#2	5309.6	72889.	8927.9
#3	5338.5	72437.	9014.0

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702122802 Acquired: 2/27/2017 19:08:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00121	.06902	-.00732	.03293	.00193	-.00006	54.411
Stddev	.00196	.00095	.00334	.00337	.00052	.00007	.087
%RSD	161.78	1.3758	45.593	10.229	26.822	115.24	.15974

#1	.00083	.07005	-.00378	.03259	.00178	.00002	54.498
#2	-.00138	.06882	-.01042	.03645	.00150	-.00011	54.413
#3	-.00309	.06819	-.00777	.02974	.00251	-.00010	54.324

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00013	.02078	.08050	.07805	.26241	13.320	.00332
Stddev	.00033	.00051	.00175	.00211	.00511	.077	.00426
%RSD	256.01	2.4711	2.1678	2.7001	1.9487	.57699	128.54

#1	.00009	.02109	.07849	.08048	.26822	13.272	-.00147
#2	.00048	.02106	.08140	.07667	.26043	13.280	.00470
#3	-.00018	.02019	.08161	.07700	.25858	13.409	.00672

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.6826	1.5007	.00015	171.30	.12872	-.02305	.00057
Stddev	.0850	.0033	.00024	.72	.00069	.00726	.00128
%RSD	5.0494	.21863	163.43	.41848	.53480	31.503	225.18

#1	1.6937	1.5038	.00016	171.60	.12920	-.03132	-.00049
#2	1.7615	1.4973	-.00010	170.48	.12903	-.01773	.00021
#3	1.5926	1.5011	.00038	171.82	.12793	-.02010	.00199

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702122802 Acquired: 2/27/2017 19:08:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00641	F -0.01180	1.2087	.00114	.14462	-0.00522	-0.00034
Stddev	.00689	.00321	.0028	.00041	.00023	.00328	.00583
%RSD	107.49	27.217	.23247	36.442	.15753	62.823	1729.6

#1	-.00737	-.01479	1.2069	.00067	.14454	-.00807	.00084
#2	.00091	-.00841	1.2072	.00129	.14444	-.00163	.00482
#3	-.01277	-.01222	1.2119	.00145	.14487	-.00597	-.00667

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00004	5.4837	.02449
Stddev	.00016	.0031	.20743
%RSD	390.62	.05598	847.10

#1	.00012	5.4813	-.11361
#2	-.00021	5.4825	-.07594
#3	-.00003	5.4872	.26302

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5223.1	71780.	9453.5
Stddev	4.4	307.	51.5
%RSD	.08375	.42809	.54486

#1	5222.1	72075.	9440.6
#2	5227.8	71803.	9510.3
#3	5219.2	71462.	9409.7

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126001 Acquired: 2/27/2017 19:12:04 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00211	3.5883	.03975	.03495	.03930	.00032	4.6481	.00088
Stddev	.00097	.0099	.00198	.00148	.00065	.00009	.0203	.00050
%RSD	46.083	.27692	4.9907	4.2360	1.6651	29.085	.43667	56.904

#1	-0.00283	3.5832	.03899	.03596	.03855	.00042	4.6695	.00045
#2	-0.00100	3.5820	.04201	.03564	.03967	.00032	4.6455	.00076
#3	-0.00249	3.5998	.03827	.03325	.03970	.00023	4.6292	.00144

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00460	.00832	.02437	8.3105	4.5885	.00918	2.3778	.42690
Stddev	.00014	.00078	.00052	.0296	.0550	.00551	.0030	.00095
%RSD	3.0548	9.3294	2.1261	.35668	1.1994	60.058	.12758	.22289

#1	.00448	.00913	.02378	8.2977	4.6419	.00478	2.3768	.42800
#2	.00475	.00823	.02472	8.2894	4.5320	.00740	2.3812	.42635
#3	.00457	.00759	.02462	8.3444	4.5918	.01537	2.3754	.42636

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00099	117.37	.00897	.74707	.00322	.05798	-.00137	7.9103
Stddev	.00026	.54	.00016	.00682	.00756	.00341	.01103	.0312
%RSD	26.361	.45651	1.8257	.91260	234.81	5.8823	804.17	.39418

#1	.00088	116.80	.00915	.74625	.01017	.05612	-.01024	7.9407
#2	.00080	117.45	.00883	.74069	-.00483	.05591	.01098	7.9117
#3	.00129	117.86	.00895	.75426	.00431	.06192	-.00485	7.8784

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126001 Acquired: 2/27/2017 19:12:04 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00131	.01609	.05652	-.00360	.01569	.09838	2.3125
Stddev	.00125	.00009	.00436	.00364	.00047	.00025	.2448
%RSD	95.265	.58549	7.7165	101.16	3.0196	.25215	10.587

#1	.00105	.01598	.05149	-.00655	.01608	.09825	2.3470
#2	.00022	.01613	.05927	.00047	.01583	.09822	2.0522
#3	.00267	.01615	.05880	-.00473	.01516	.09867	2.5382

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5213.6	72187.	9536.6
Stddev	10.2	121.	83.1
%RSD	.19573	.16790	.87117

#1	5205.5	72327.	9619.1
#2	5225.1	72109.	9537.8
#3	5210.3	72125.	9453.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132401 Acquired: 2/27/2017 19:15:52 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00227	.00517	-.00406	-.00029	.00060	-.00004	.03826
Stddev	.00107	.00474	.00257	.00144	.00035	.00005	.00426
%RSD	47.093	91.658	63.209	498.67	58.415	109.21	11.136

#1	-.00205	.00331	-.00177	.00134	.00023	-.00007	.03879
#2	-.00133	.01055	-.00358	-.00083	.00094	-.00007	.04223
#3	-.00343	.00164	-.00684	-.00138	.00064	.00001	.03376

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00030	-.00009	.00051	.00166	-.00226	.10961	.00135
Stddev	.00040	.00003	.00061	.00189	.00493	.05472	.00212
%RSD	131.11	27.771	119.76	114.22	217.87	49.922	156.52

#1	-.00014	-.00011	.00108	-.00052	.00248	.17275	.00225
#2	.00042	-.00006	.00058	.00254	-.00191	.07599	-.00107
#3	.00063	-.00010	-.00013	.00295	-.00736	.08009	.00288

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00131	.00164	-.00021	.27647	.00273	-.00843	-.00494
Stddev	.06048	.00038	.00011	.01930	.00036	.00509	.00288
%RSD	4617.4	22.976	54.185	6.9813	13.150	60.337	58.239

#1	.00964	.00196	-.00014	.29532	.00236	-.01284	-.00658
#2	-.06290	.00173	-.00034	.25674	.00275	-.00287	-.00162
#3	.05719	.00123	-.00014	.27735	.00307	-.00958	-.00662

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702132401 Acquired: 2/27/2017 19:15:52 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00296	-0.00413	.05476	-0.00006	.00038	.00061	-0.00152
Stddev	.00354	.00895	.00094	.00140	.00009	.00201	.00298
%RSD	119.37	216.77	1.7172	2235.4	25.140	331.03	196.20

#1	-0.00282	-0.00585	.05582	-0.00007	.00041	.00215	-0.00159
#2	-0.00656	.00556	.05445	-0.00146	.00045	-0.00166	-0.00446
#3	.00050	-0.01209	.05401	.00134	.00027	.00133	.00150

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00015	.00086	F -.09327
Stddev	.00104	.00022	.27069
%RSD	687.90	25.483	290.22

#1	-0.00100	.00088	-.28041
#2	.00101	.00108	-.21652
#3	.00045	.00064	.21711

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5275.1	73618.	9038.3
Stddev	27.4	146.	20.1
%RSD	.51861	.19847	.22214

#1	5260.7	73726.	9049.5
#2	5258.0	73678.	9050.3
#3	5306.7	73452.	9015.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132402 Acquired: 2/27/2017 19:19:42 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0211	.02110	.00430	.10932	F 48.234	.00051	F 1274.1
Stddev	.00161	.00495	.00771	.00212	.118	.00002	5.1
%RSD	75.954	23.477	179.35	1.9364	.24446	4.5700	.39947

#1	-0.00390	.02098	-0.00353	.10805	48.355	.00048	1268.8
#2	-0.00078	.01620	.00455	.11176	48.119	.00051	1279.0
#3	-0.00166	.02611	.01188	.10814	48.227	.00053	1274.4

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail
High Limit					45.000		270.00
Low Limit					-0.00500		-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00831	.00831	.00462	.01755	34.750	124.42	1.2551
Stddev	.00043	.00028	.00183	.00413	.224	.80	.0031
%RSD	5.2090	3.3952	39.595	23.536	.64494	.64077	.24582

#1	.00851	.00828	.00668	.01405	34.496	123.51	1.2559
#2	.00861	.00860	.00400	.01650	34.835	125.00	1.2577
#3	.00781	.00804	.00318	.02211	34.919	124.76	1.2517

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	175.22	16.421	.00287	F 494.11	-0.00556	.04607	.00916
Stddev	1.19	.102	.00029	3.04	.00169	.00457	.01101
%RSD	.68061	.62316	9.9447	.61551	30.321	9.9300	120.16

#1	173.88	16.303	.00254	495.92	-0.00692	.05111	.00546
#2	176.15	16.491	.00301	490.60	-0.00609	.04494	.02155
#3	175.63	16.468	.00307	495.82	-0.00367	.04217	.00048

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132402 Acquired: 2/27/2017 19:19:42 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02478	F -.04614	4.4958	.00152	F 51.001	F -.10771	-.01128
Stddev	.00247	.01143	.0254	.00168	.367	.00291	.01021
%RSD	9.9735	24.778	.56530	110.61	.71982	2.7016	90.522

#1	-.02389	-.05361	4.4949	.00151	51.151	-.11075	-.01032
#2	-.02287	-.05183	4.5216	-.00016	50.583	-.10744	-.00158
#3	-.02757	-.03298	4.4708	.00321	51.269	-.10495	-.02193

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00087	.00126	F -1.4851
Stddev	.00062	.00044	.3635
%RSD	70.892	35.378	24.478

#1	.00029	.00175	-1.2570
#2	.00080	.00114	-1.2939
#3	.00153	.00088	-1.9043

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4171.7	57035.	8559.1
Stddev	10.2	188.	49.9
%RSD	.24479	.33000	.58307

#1	4159.9	56818.	8605.8
#2	4178.1	57152.	8565.0
#3	4177.0	57135.	8506.5

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132403 Acquired: 2/27/2017 19:24:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00299	.01043	.01348	.10014	F 46.953	.00048	F 1225.2
Stddev	.00221	.00365	.00542	.00389	.929	.00009	14.0
%RSD	73.874	34.984	40.205	3.8800	1.9783	18.275	1.1400

#1	-.00245	.00622	.00802	.10115	47.941	.00038	1227.3
#2	-.00110	.01259	.01886	.10342	46.097	.00054	1238.1
#3	-.00542	.01248	.01357	.09585	46.822	.00053	1210.4

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail
High Limit					45.000		270.00
Low Limit					-.00500		-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00799	.00741	.00344	.02043	32.885	89.769	1.0665
Stddev	.00032	.00043	.00063	.00156	.174	.384	.0056
%RSD	4.0386	5.8585	18.321	7.6258	.53048	.42760	.52118

#1	.00831	.00703	.00411	.02196	32.974	89.843	1.0619
#2	.00800	.00788	.00286	.02048	32.684	89.354	1.0650
#3	.00767	.00731	.00336	.01884	32.997	90.111	1.0727

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	191.83	15.653	.00301	F 469.03	-.00529	.05612	.00819
Stddev	.55	.024	.00077	2.60	.00225	.00840	.00283
%RSD	.28834	.15643	25.448	.55501	42.463	14.975	34.555

#1	192.10	15.660	.00214	466.34	-.00369	.04682	.01003
#2	191.19	15.626	.00331	469.22	-.00786	.06317	.00493
#3	192.19	15.673	.00358	471.54	-.00433	.05836	.00960

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132403 Acquired: 2/27/2017 19:24:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-01

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.03527	F -.07525	3.9740	.00459	F 53.963	F -.11192	-.00037
Stddev	.00616	.00117	.0228	.00198	.800	.00344	.00696
%RSD	17.477	1.5571	.57310	43.091	1.4818	3.0745	1860.9

#1	-.03501	-.07660	3.9935	.00462	54.392	-.11293	-.00726
#2	-.02923	-.07455	3.9795	.00655	54.457	-.10809	-.00051
#3	-.04155	-.07460	3.9489	.00260	53.040	-.11475	.00665

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00029	.00024	F -1.8617
Stddev	.00088	.00041	.0453
%RSD	302.29	168.81	2.4342

#1	.00020	-.00011	-1.9114
#2	-.00054	.00014	-1.8228
#3	.00121	.00069	-1.8508

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4177.3	56546.	8457.0
Stddev	1.5	788.	137.1
%RSD	.03646	1.3940	1.6215

#1	4178.5	57349.	8303.8
#2	4177.8	56517.	8568.4
#3	4175.6	55773.	8498.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132404MS Acquired: 2/27/2017 19:28:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21727	4.3738	.22472	1.0471	F 47.528	.02467	F 1189.0
Stddev	.00178	.0139	.00380	.0049	.547	.00016	9.9
%RSD	.81762	.31794	1.6916	.46477	1.1503	.63856	.83217

#1	.21894	4.3895	.22549	1.0415	47.318	.02470	1181.1
#2	.21540	4.3632	.22059	1.0498	47.118	.02481	1200.1
#3	.21747	4.3686	.22808	1.0501	48.149	.02450	1185.7

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail
High Limit					45.000		270.00
Low Limit					-.00500		-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03421	.09797	.23810	.25191	34.686	116.52	1.6159
Stddev	.00063	.00062	.00179	.00050	.140	.60	.0060
%RSD	1.8374	.63381	.75081	.19997	.40423	.51120	.37008

#1	.03391	.09864	.23862	.25239	34.525	115.86	1.6101
#2	.03493	.09784	.23956	.25193	34.755	116.70	1.6220
#3	.03378	.09742	.23610	.25139	34.779	117.01	1.6157

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	197.00	15.932	.47958	F 487.10	.22006	5.1426	.22691
Stddev	1.17	.056	.00104	3.74	.00336	.0149	.00661
%RSD	.59647	.35140	.21588	.76824	1.5256	.28969	2.9143

#1	195.67	15.869	.47949	484.43	.21655	5.1369	.22106
#2	197.89	15.955	.48066	491.37	.22323	5.1595	.22559
#3	197.44	15.973	.47859	485.48	.22040	5.1315	.23409

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132404MS Acquired: 2/27/2017 19:28:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-04

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.58589	.15225	6.6337	.45139	F 54.399	.37316	.19999
Stddev	.00914	.01073	.0151	.00193	.120	.00927	.01359
%RSD	1.5602	7.0444	.22828	.42741	.22095	2.4850	6.7974

#1	.59083	.16165	6.6484	.45361	54.273	.36360	.20689
#2	.59151	.14057	6.6346	.45013	54.413	.38211	.20875
#3	.57534	.15454	6.6181	.45042	54.512	.37376	.18433

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit					9.0000		
Low Limit					-.01000		

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.49004	.45213	F -1.5109
Stddev	.00031	.00111	.1441
%RSD	.06419	.24636	9.5352

#1	.49025	.45218	-1.3823
#2	.48968	.45322	-1.6665
#3	.49018	.45100	-1.4837

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4188.1	57125.	8464.0
Stddev	5.2	109.	41.4
%RSD	.12429	.19165	.48911

#1	4193.9	57021.	8460.9
#2	4186.4	57115.	8506.9
#3	4183.9	57240.	8424.3

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132405MSD Acquired: 2/27/2017 19:32:32 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22157	4.4716	.23510	1.0757	F 49.209	.02520	F 1165.1
Stddev	.00192	.0068	.00253	.0021	.668	.00008	2.9
%RSD	.86652	.15222	1.0758	.19700	1.3574	.33467	.24930

#1	.22302	4.4638	.23737	1.0735	49.805	.02526	1163.8
#2	.21940	4.4748	.23238	1.0777	48.487	.02523	1163.2
#3	.22230	4.4763	.23556	1.0760	49.335	.02510	1168.5

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail
High Limit					45.000		270.00
Low Limit					-.00500		-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03431	.10008	.24622	.25874	35.645	119.51	1.6547
Stddev	.00036	.00105	.00127	.00049	.100	.46	.0150
%RSD	1.0581	1.0451	.51460	.18999	.28069	.38557	.90495

#1	.03443	.10009	.24755	.25838	35.758	120.05	1.6717
#2	.03390	.10113	.24503	.25930	35.607	119.23	1.6489
#3	.03460	.09903	.24608	.25854	35.569	119.26	1.6434

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	201.08	16.271	.49456	F 504.38	.22597	5.2991	.23614
Stddev	.90	.083	.00070	6.84	.00245	.0180	.00266
%RSD	.44844	.51001	.14228	1.3554	1.0828	.34001	1.1276

#1	202.05	16.366	.49528	503.52	.22864	5.2800	.23831
#2	200.93	16.232	.49388	498.02	.22383	5.3014	.23317
#3	200.26	16.214	.49453	511.61	.22545	5.3158	.23693

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132405MSD Acquired: 2/27/2017 19:32:32 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604236-05

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.60857	.15047	6.8311	.46690	F 56.385	.38709	.21056
Stddev	.00755	.01858	.0126	.00268	.337	.00344	.00655
%RSD	1.2412	12.350	.18469	.57318	.59767	.88866	3.1117

#1	.60511	.15197	6.8440	.46970	56.558	.38669	.20862
#2	.60336	.13119	6.8307	.46662	56.601	.39071	.21786
#3	.61723	.16827	6.8187	.46437	55.997	.38387	.20519

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit					9.0000		
Low Limit					-.01000		

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.50286	.46600	F -1.3972
Stddev	.00235	.00107	.2697
%RSD	.46650	.22902	19.300

#1	.50553	.46601	-1.3077
#2	.50192	.46707	-1.1837
#3	.50114	.46493	-1.7002

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4170.6	57216.	8422.0
Stddev	4.7	132.	36.1
%RSD	.11313	.23107	.42864

#1	4166.3	57191.	8393.9
#2	4169.7	57098.	8462.7
#3	4175.7	57359.	8409.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132406 Acquired: 2/27/2017 19:36:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00057	.00330	-0.00603	.00276	.00099	-0.00002	.07632	.00044
Stddev	.00256	.00637	.00435	.00466	.00037	.00006	.01789	.00029
%RSD	447.15	193.20	72.115	168.83	37.663	293.21	23.434	65.301

#1	-0.00348	.00622	-0.00544	.00814	.00065	-0.00008	.09335	.00062
#2	.00130	-0.00401	-0.01065	-0.00008	.00092	.00002	.07793	.00011
#3	.00046	.00769	-0.00201	.00023	.00139	.00001	.05769	.00059

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00019	.00046	-0.00030	.07914	.57338	-0.00090	-0.00263	.00217
Stddev	.00007	.00118	.00107	.00495	.01084	.00247	.03212	.00187
%RSD	37.281	257.51	353.67	6.2600	1.8907	275.70	1223.5	86.250

#1	-0.00023	.00165	.00087	.07427	.57324	.00114	.03435	.00426
#2	-0.00022	-0.00071	-0.00122	.08417	.58429	-0.00018	-.02359	.00158
#3	-0.00011	.00043	-0.00055	.07897	.56261	-0.00365	-.01863	.00066

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00030	.44596	.00203	-0.01034	-0.00264	-0.00741	-0.00450	.07955
Stddev	.00077	.01867	.00042	.00817	.00064	.00532	.00913	.00345
%RSD	253.69	4.1860	20.985	78.989	24.083	71.749	202.99	4.3422

#1	.00091	.46467	.00219	-0.01908	-0.00327	-0.00293	-.00490	.08285
#2	.00057	.44589	.00154	-0.00905	-0.00200	-0.00602	-.01342	.07985
#3	-0.00057	.42733	.00234	-0.00290	-0.00266	-0.01328	.00483	.07596

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132406 Acquired: 2/27/2017 19:36:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00053	.00112	-0.00368	-0.00989	.00016	.00079	.24920
Stddev	.00070	.00016	.00327	.00579	.00094	.00036	.09959
%RSD	131.38	14.158	88.891	58.509	589.81	45.450	39.965

#1	-0.00066	.00112	-0.00060	-.01638	.00053	.00119	.19869
#2	-0.00116	.00096	-0.00710	-.00525	-.00091	.00052	.36393
#3	.00022	.00127	-0.00333	-.00805	.00085	.00064	.18499

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5243.0	73292.	8969.6
Stddev	6.2	332.	58.7
%RSD	.11896	.45340	.65418

#1	5248.5	73592.	8919.0
#2	5244.4	73350.	9033.9
#3	5236.2	72935.	8956.0

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702132407 Acquired: 2/27/2017 19:40:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00371	.01580	.00657	.10422	44.728	.00044	F 1256.2
Stddev	.00027	.00348	.00720	.00419	.310	.00009	11.3
%RSD	7.1634	22.057	109.49	4.0187	.69286	20.447	.89992

#1	-.00360	.01184	.00533	.09962	45.027	.00037	1269.0
#2	-.00351	.01714	.00008	.10782	44.748	.00041	1252.1
#3	-.00401	.01840	.01431	.10522	44.408	.00055	1247.5

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00808	.00760	.00393	.02272	39.202	117.68	1.2136
Stddev	.00030	.00035	.00231	.00207	.201	.14	.0024
%RSD	3.7675	4.5788	58.785	9.1039	.51358	.11801	.19414

#1	.00790	.00799	.00262	.02323	39.385	117.52	1.2118
#2	.00791	.00732	.00660	.02449	39.234	117.78	1.2129
#3	.00843	.00750	.00258	.02044	38.986	117.74	1.2163

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	183.55	17.200	.00259	F 482.72	-.00524	.05506	.00427
Stddev	.80	.030	.00048	4.98	.00049	.01670	.00469
%RSD	.43565	.17244	18.413	1.0315	9.4131	30.340	109.75

#1	182.95	17.167	.00214	488.47	-.00573	.07245	.00954
#2	184.46	17.225	.00255	479.91	-.00474	.05359	.00053
#3	183.25	17.208	.00309	479.77	-.00526	.03914	.00275

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132407 Acquired: 2/27/2017 19:40:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -0.02016	F -0.06378	4.3696	.00312	F 50.028	F -1.11274	-0.00445
Stddev	.00721	.01592	.0170	.00146	.511	.00375	.00916
%RSD	35.759	24.966	.38944	46.828	1.0221	3.3303	205.78

#1	-.02847	-.06585	4.3771	.00288	49.561	-.10848	-.00604
#2	-.01643	-.07857	4.3815	.00469	50.574	-.11555	-.01271
#3	-.01558	-.04693	4.3501	.00180	49.950	-.11420	.00540

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00008	.00412	F -1.9354
Stddev	.00202	.00027	.1044
%RSD	2451.3	6.6319	5.3955

#1	.00240	.00380	-1.8399
#2	-.00131	.00430	-2.0469
#3	-.00085	.00425	-1.9194

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4155.6	57357.	8420.4
Stddev	9.8	114.	56.8
%RSD	.23544	.19911	.67459

#1	4165.6	57427.	8406.5
#2	4155.1	57419.	8371.7
#3	4146.1	57225.	8482.8

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702133401 Acquired: 2/27/2017 19:44:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00167	.10285	-.00795	.01010	.00222	-.00006	.66905	.00021
Stddev	.00222	.00349	.00413	.00260	.00061	.00003	.05195	.00006
%RSD	133.37	3.3961	51.920	25.750	27.396	53.337	7.7647	29.795

#1	-.00421	.10165	-.01270	.01242	.00214	-.00007	.72617	.00015
#2	-.00011	.10678	-.00524	.01057	.00166	-.00009	.62462	.00027
#3	-.00067	.10011	-.00591	.00729	.00287	-.00003	.65635	.00021

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	-.00068	.01325	.08152	.55478	.00303	.05774	.00215
Stddev	.00020	.00160	.00153	.00173	.05215	.00175	.01991	.00115
%RSD	45.877	234.71	11.580	2.1189	9.4001	57.774	34.477	53.587

#1	.00023	-.00252	.01220	.08131	.60813	.00505	.07799	.00097
#2	.00063	.00041	.01501	.07991	.55227	.00206	.05703	.00327
#3	.00043	.00006	.01253	.08334	.50392	.00199	.03819	.00220

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00027	.41730	.00233	-.00009	.00038	-.00968	-.00195	.19087
Stddev	.00074	.02823	.00038	.00126	.00316	.00627	.00271	.00585
%RSD	272.81	6.7648	16.535	1478.7	839.14	64.761	138.96	3.0653

#1	.00035	.44962	.00273	.00137	.00147	-.00249	.00107	.19151
#2	-.00051	.40482	.00196	-.00077	.00285	-.01398	-.00275	.18472
#3	.00097	.39746	.00230	-.00085	-.00319	-.01258	-.00418	.19637

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702133401 Acquired: 2/27/2017 19:44:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00104	.00313	.00571	-.00438	-.00060	.00689	.24835
Stddev	.00024	.00062	.00201	.00365	.00044	.00015	.20070
%RSD	23.159	19.841	35.155	83.306	73.470	2.2294	80.813

#1	.00112	.00312	.00720	-.00550	-.00043	.00689	.01975
#2	.00122	.00375	.00343	-.00734	-.00027	.00704	.39563
#3	.00077	.00251	.00650	-.00030	-.00110	.00673	.32967

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5332.7	74665.	9213.8
Stddev	5.7	144.	46.0
%RSD	.10635	.19246	.49950

#1	5338.8	74764.	9161.4
#2	5327.6	74500.	9247.7
#3	5331.6	74731.	9232.3

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 19:48:44 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40796	10.507	.41265	.51339	1.0350	.05128	10.331
Stddev	.00063	.025	.00206	.00142	.0007	.00005	.035
%RSD	.15388	.23708	.50016	.27650	.06527	.10709	.33603

#1	.40724	10.483	.41185	.51318	1.0345	.05134	10.315
#2	.40842	10.533	.41111	.51208	1.0358	.05123	10.371
#3	.40820	10.506	.41500	.51490	1.0347	.05128	10.307

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05094	.20575	.51925	.51975	4.0612	53.199	1.0564
Stddev	.00028	.00100	.00144	.00097	.0235	.092	.0051
%RSD	.55327	.48741	.27724	.18571	.57954	.17214	.48512

#1	.05098	.20514	.52089	.52065	4.0342	53.095	1.0536
#2	.05065	.20520	.51820	.51987	4.0723	53.267	1.0623
#3	.05121	.20690	.51865	.51873	4.0772	53.236	1.0533

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.099	.50161	1.0227	52.531	.51899	10.298	.52023
Stddev	.034	.00172	.0017	.215	.00134	.027	.00355
%RSD	.33508	.34328	.16918	.40994	.25866	.26326	.68268

#1	10.138	.50346	1.0216	52.301	.51919	10.287	.52321
#2	10.083	.50131	1.0218	52.563	.52022	10.278	.52118
#3	10.077	.50006	1.0247	52.728	.51755	10.329	.51630

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 19:48:44 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2278	.41631	5.1435	1.0370	1.0323	1.0169	.53038
Stddev	.0058	.00807	.0158	.0022	.0013	.0085	.00745
%RSD	.47044	1.9389	.30719	.21176	.12296	.83566	1.4042

#1	1.2225	.40788	5.1378	1.0394	1.0308	1.0080	.53835
#2	1.2268	.41706	5.1312	1.0352	1.0331	1.0177	.52360
#3	1.2340	.42397	5.1613	1.0362	1.0328	1.0249	.52918

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0316	1.0446	F .83058
Stddev	.0005	.0035	.16420
%RSD	.05228	.33384	19.769

#1	1.0318	1.0433	.94986
#2	1.0321	1.0420	.64330
#3	1.0310	1.0486	.89857

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5182.3	70326.	8942.4
Stddev	13.3	106.	62.1
%RSD	.25730	.15051	.69469

#1	5175.0	70223.	9012.4
#2	5197.7	70435.	8920.9
#3	5174.2	70319.	8893.8

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 19:52:19 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00184	-0.00605	.00389	.00363	.00070	-0.00007	-0.01545
Stddev	.00057	.00285	.00241	.00230	.00072	.00001	.01356
%RSD	30.982	47.144	61.984	63.246	102.57	12.275	87.773

#1	-0.00244	-0.00726	.00658	.00582	.00037	-0.00007	-0.03084
#2	-0.00177	-0.00809	.00317	.00124	.00021	-0.00008	-0.00528
#3	-0.00131	-0.00279	.00192	.00385	.00153	-0.00006	-0.01022

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00032	-0.00016	-0.00037	-0.00192	-0.00042	.29746	.00033
Stddev	.00030	.00017	.00083	.00101	.00877	.06051	.00205
%RSD	95.120	104.48	226.13	52.501	2095.4	20.341	624.65

#1	-0.00061	-0.00010	-0.00115	-0.00077	-0.00870	.30679	-0.00201
#2	-0.00034	-0.00003	-0.00044	-0.00265	-0.00132	.35277	.00183
#3	-0.00001	-0.00035	.00050	-0.00232	.00877	.23283	.00116

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03937	.00134	-0.00016	.12702	.00064	-0.00149	F -.00646
Stddev	.02087	.00200	.00055	.00883	.00170	.00513	.00340
%RSD	53.021	149.54	339.08	6.9532	267.41	344.71	52.732

#1	.03860	.00177	.00036	.11694	.00206	.00269	-0.00457
#2	.01889	-0.00084	-0.00011	.13340	.00111	-0.00721	-0.00441
#3	.06061	.00308	-0.00073	.13073	-0.00125	.00006	-0.01039

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							.00500
Low Limit							-.00500

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 19:52:19 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00829	.00634	.00089	-0.00073	.00013	-0.00575	-0.00417
Stddev	.00634	.00451	.00359	.00065	.00009	.00170	.00284
%RSD	76.401	71.166	404.26	89.563	69.454	29.565	68.145

#1	-.01007	.01154	-.00256	-.00039	.00012	-.00742	-.00092
#2	-.01355	.00373	.00062	-.00032	.00005	-.00402	-.00538
#3	-.00126	.00373	.00460	-.00148	.00023	-.00581	-.00621

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00044	-0.0062	F .36393
Stddev	.00018	.00039	.10749
%RSD	41.826	61.928	29.537

#1	.00036	-.00107	.45496
#2	.00030	-.00040	.39149
#3	.00064	-.00040	.24534

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5276.4	72553.	8971.6
Stddev	2.3	238.	25.5
%RSD	.04331	.32787	.28446

#1	5277.7	72588.	8971.9
#2	5273.7	72299.	8996.9
#3	5277.7	72771.	8945.9

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702134601 Acquired: 2/27/2017 19:56:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00368	69.517	.07501	.06095	.58950	.00349	146.07
Stddev	.00091	.024	.00436	.00162	.00114	.00004	.56
%RSD	24.652	.03489	5.8173	2.6600	.19345	1.0466	.38545

#1	.00275	69.502	.07005	.06280	.58866	.00351	145.91
#2	.00372	69.545	.07673	.05978	.58904	.00345	145.60
#3	.00456	69.504	.07825	.06026	.59080	.00351	146.69

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01843	.03505	.09501	1.8370	57.160	14.197	.04620
Stddev	.00055	.00019	.00048	.0021	.186	.036	.00201
%RSD	3.0031	.53271	.50312	.11132	.32493	.25167	4.3536

#1	.01907	.03486	.09496	1.8372	57.316	14.237	.04477
#2	.01810	.03507	.09456	1.8390	57.210	14.170	.04533
#3	.01811	.03523	.09551	1.8349	56.955	14.183	.04850

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	30.581	1.4022	.00215	F 287.70	.12391	69.938	.31569
Stddev	.140	.0053	.00142	1.31	.00152	.057	.00250
%RSD	.45884	.38069	66.145	.45620	1.2246	.08168	.79099

#1	30.502	1.4000	.00233	286.59	.12513	69.876	.31300
#2	30.499	1.4083	.00348	287.37	.12221	69.989	.31613
#3	30.743	1.3983	.00065	289.15	.12438	69.949	.31794

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702134601 Acquired: 2/27/2017 19:56:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0048	-0.00216	F 69.184	.03875	.42404	.88057	-0.00160
Stddev	.00488	.00840	.081	.00065	.00164	.00677	.00153
%RSD	1007.2	388.86	.11688	1.6840	.38789	.76904	95.774

#1	-0.00582	.00205	69.221	.03852	.42389	.88611	-0.00245
#2	.00374	.00330	69.240	.03948	.42247	.88257	.00017
#3	.00063	-.01184	69.092	.03824	.42575	.87302	-.00250

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			36.000				
Low Limit			-1.0000				

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.09762	1.1402	33.310
Stddev	.00044	.0029	.121
%RSD	.44572	.25517	.36231

#1	.09757	1.1371	33.309
#2	.09721	1.1428	33.189
#3	.09808	1.1408	33.431

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5104.9	68902.	9296.8
Stddev	14.4	68.	15.9
%RSD	.28294	.09926	.17051

#1	5120.7	68837.	9283.7
#2	5092.5	68973.	9314.4
#3	5101.5	68897.	9292.2

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702134602 Acquired: 2/27/2017 19:59:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00381	55.033	.09204	.06395	.50363	.00234	67.923
Stddev	.00092	.089	.00690	.00169	.00062	.00003	.152
%RSD	24.258	.16212	7.5003	2.6449	.12301	1.1366	.22423

#1	.00346	54.973	.09986	.06392	.50297	.00234	67.840
#2	.00311	55.135	.08678	.06226	.50372	.00231	67.831
#3	.00486	54.991	.08949	.06565	.50420	.00237	68.099

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01627	.03100	.06657	1.4387	61.240	12.176	.03339
Stddev	.00036	.00022	.00065	.0027	.180	.052	.00335
%RSD	2.1998	.70333	.97066	.19025	.29317	.42681	10.038

#1	.01595	.03075	.06582	1.4358	61.086	12.116	.03535
#2	.01666	.03107	.06692	1.4413	61.196	12.204	.03530
#3	.01621	.03117	.06696	1.4390	61.437	12.209	.02952

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	19.202	1.2675	.00591	F 394.07	.09565	109.44	.28523
Stddev	.069	.0054	.00103	5.65	.00264	.14	.00185
%RSD	.35773	.42296	17.442	1.4330	2.7566	.12547	.64926

#1	19.181	1.2653	.00625	399.82	.09292	109.58	.28355
#2	19.146	1.2636	.00475	393.88	.09585	109.44	.28722
#3	19.278	1.2736	.00673	388.53	.09819	109.30	.28493

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702134602 Acquired: 2/27/2017 19:59:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00594	-0.00200	F 68.235	.02636	.22633	.83795	-0.00432
Stddev	.01003	.00416	.074	.00116	.00101	.00363	.00501
%RSD	168.65	208.03	.10903	4.4125	.44657	.43264	115.99

#1	-0.00201	-0.00673	68.318	.02598	.22590	.83468	-.00159
#2	.00151	-.00040	68.173	.02767	.22560	.84185	-.00127
#3	-.01734	.00112	68.215	.02544	.22748	.83732	-.01010

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			36.000				
Low Limit			-1.0000				

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.06980	.94751	29.070
Stddev	.00037	.00086	.177
%RSD	.52787	.09059	.60798

#1	.06995	.94709	28.918
#2	.07006	.94850	29.028
#3	.06938	.94694	29.264

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5045.7	67851.	9100.4
Stddev	15.8	79.	37.1
%RSD	.31231	.11709	.40765

#1	5061.7	67929.	9094.8
#2	5045.3	67854.	9140.0
#3	5030.1	67771.	9066.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135301 Acquired: 2/27/2017 20:03:45 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00170	.27417	-0.00481	.01158	.00337	-0.00008	1.9232	.00025
Stddev	.00105	.00840	.00228	.00394	.00050	.00001	.0101	.00007
%RSD	61.615	3.0651	47.437	34.004	14.708	9.6071	.52749	27.437

#1	-0.00204	.28339	-0.00567	.01613	.00299	-0.00008	1.9296	.00018
#2	-0.00254	.26693	-0.00653	.00919	.00320	-0.00007	1.9115	.00026
#3	-0.00053	.27220	-0.00222	.00942	.00393	-0.00009	1.9285	.00032

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00008	-0.00055	.01818	.24028	.43478	.00222	.30924	.00677
Stddev	.00015	.00015	.00052	.01891	.05530	.00366	.04374	.00129
%RSD	185.25	27.847	2.8360	7.8699	12.719	164.43	14.144	19.015

#1	-0.00025	-0.00045	.01763	.26149	.40466	.00536	.27866	.00817
#2	.00002	-0.00073	.01826	.23420	.49860	.00311	.35934	.00653
#3	-0.00002	-0.00048	.01866	.22516	.40107	-0.00179	.28972	.00562

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00055	.49292	.00073	.01303	-0.00033	-0.00076	.00363	.43298
Stddev	.00068	.00881	.00009	.00385	.00580	.00275	.00601	.00184
%RSD	124.02	1.7865	12.393	29.536	1762.5	363.11	165.70	.42477

#1	-0.00008	.50163	.00063	.01748	.00367	-0.00286	.01048	.43396
#2	.00046	.49313	.00079	.01088	-0.00698	.00236	-0.00075	.43412
#3	.00127	.48402	.00078	.01074	.00232	-0.00177	.00115	.43086

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135301 Acquired: 2/27/2017 20:03:45 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00103	.00408	.00973	-.00670	.00110	.01588	.40603
Stddev	.00059	.00040	.00483	.00417	.00012	.00014	.14547
%RSD	57.849	9.7474	49.613	62.168	11.212	.88252	35.828
#1	.00077	.00428	.00924	-.00695	.00097	.01572	.50118
#2	.00060	.00433	.01478	-.00242	.00110	.01595	.47833
#3	.00170	.00362	.00516	-.01074	.00122	.01597	.23857

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5376.6	75099.	8978.6
Stddev	16.8	260.	52.4
%RSD	.31221	.34652	.58342
#1	5387.0	74858.	8924.9
#2	5385.4	75065.	8981.4
#3	5357.2	75375.	9029.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135302 Acquired: 2/27/2017 20:07:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00237	.43072	-0.00155	.01351	.00360	-0.00006	1.4735	.00037
Stddev	.00068	.00737	.00327	.00296	.00043	.00007	.0198	.00037
%RSD	28.553	1.7108	210.17	21.921	11.868	103.25	1.3416	100.58

#1	-0.00226	.42455	.00004	.01075	.00312	-0.00004	1.4855	.00005
#2	-0.00176	.43888	.00061	.01664	.00373	-0.00002	1.4507	.00028
#3	-0.00310	.42873	-0.00531	.01315	.00395	-0.00014	1.4844	.00077

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00029	.00011	.06808	.27769	.43170	.00462	.19881	.00711
Stddev	.00051	.00104	.00105	.00398	.07614	.00552	.04791	.00064
%RSD	178.00	968.18	1.5484	1.4315	17.637	119.33	24.100	9.0275

#1	-0.00030	-0.00032	.06903	.28226	.48197	-0.00146	.14742	.00658
#2	.00055	.00130	.06694	.27503	.46904	.00602	.20676	.00782
#3	.00061	-0.00066	.06825	.27579	.34410	.00930	.24225	.00692

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00082	.41219	.00317	-0.00329	.00067	-0.01145	-0.00441	.68885
Stddev	.00022	.01119	.00185	.00390	.00479	.00779	.00763	.00107
%RSD	27.055	2.7159	58.438	118.66	719.44	68.052	172.77	.15568

#1	-0.00106	.41406	.00529	-0.00111	.00032	-0.00256	-.01273	.68841
#2	-0.00062	.42234	.00184	-0.00779	.00562	-0.01708	.00224	.68807
#3	-0.00078	.40018	.00238	-0.00096	-0.00395	-0.01471	-0.00275	.69007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135302 Acquired: 2/27/2017 20:07:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00119	.00382	.00804	-.00668	.00020	.03350	.52455
Stddev	.00021	.00025	.00264	.00277	.00056	.00044	.27365
%RSD	17.702	6.4929	32.849	41.426	280.27	1.3198	52.169

#1	.00135	.00355	.00630	-.00763	.00013	.03304	.78290
#2	.00095	.00388	.01108	-.00356	.00079	.03393	.55293
#3	.00126	.00404	.00674	-.00885	-.00032	.03351	.23781

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5272.0	74081.	9056.9
Stddev	15.6	158.	17.0
%RSD	.29538	.21322	.18750

#1	5255.1	73912.	9051.2
#2	5275.1	74225.	9076.0
#3	5285.8	74107.	9043.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135303 Acquired: 2/27/2017 20:11:22 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00305	.11934	-0.00410	.00940	.00113	-0.00007	.41651	.00052
Stddev	.00095	.00897	.00514	.00320	.00011	.00002	.03048	.00032
%RSD	31.289	7.5123	125.53	34.005	9.3907	23.406	7.3183	61.351

#1	-0.00239	.11468	-0.00890	.01155	.00103	-0.00006	.40787	.00035
#2	-0.00262	.12967	-0.00472	.01091	.00124	-0.00007	.45038	.00090
#3	-0.00414	.11366	.00133	.00573	.00111	-0.00009	.39128	.00033

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00016	-0.00055	.01503	.09631	.21573	-0.00007	.03549	.00319
Stddev	.00030	.00065	.00286	.00968	.01939	.00317	.02041	.00132
%RSD	184.09	116.75	19.029	10.054	8.9875	4591.3	57.502	41.490

#1	-0.00050	-0.00120	.01406	.08608	.19864	-0.00371	.01395	.00169
#2	-0.00003	-0.00055	.01278	.09752	.21174	.00205	.05454	.00420
#3	.00004	.00009	.01825	.10533	.23680	.00145	.03798	.00367

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00013	.18207	.00174	-0.01394	.00310	-0.00354	-0.00908	.23150
Stddev	.00119	.00628	.00072	.00880	.00044	.00682	.01001	.00481
%RSD	940.17	3.4470	41.645	63.152	14.109	192.69	110.24	2.0757

#1	.00123	.18738	.00095	-0.00428	.00288	.00387	-0.00958	.23645
#2	.00028	.17515	.00238	-0.02151	.00360	-0.00955	-0.01884	.22686
#3	-0.00113	.18368	.00188	-0.01602	.00282	-0.00494	.00117	.23118

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135303 Acquired: 2/27/2017 20:11:22 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00083	.00193	-.00028	-.00081	.00015	.00559	.31808
Stddev	.00098	.00022	.00339	.00100	.00074	.00034	.25120
%RSD	117.89	11.256	1229.9	123.66	481.65	6.0530	78.974

#1	.00196	.00169	.00004	-.00104	.00028	.00534	.43391
#2	.00019	.00198	-.00381	.00029	.00082	.00598	.02986
#3	.00035	.00212	.00294	-.00168	-.00064	.00546	.49048

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5211.2	71511.	8669.0
Stddev	13.5	373.	52.9
%RSD	.25930	.52225	.61045

#1	5197.5	71311.	8680.3
#2	5211.5	71281.	8715.4
#3	5224.5	71942.	8611.4

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702135304 Acquired: 2/27/2017 20:15:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00256	.17896	-0.00477	.01180	.00216	.00001	.68361	.00030
Stddev	.00019	.00743	.00187	.00309	.00082	.00006	.01745	.00009
%RSD	7.5531	4.1505	39.089	26.159	37.749	996.44	2.5521	31.203

#1	-0.00259	.17175	-0.00684	.01114	.00146	.00003	.70052	.00041
#2	-0.00236	.17853	-0.00320	.01517	.00306	-0.00006	.66567	.00023
#3	-0.00274	.18659	-0.00428	.00910	.00197	.00005	.68463	.00026

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00005	.00021	.03189	.17342	.17741	-0.00154	.09169	.00503
Stddev	.00051	.00047	.00159	.00214	.09243	.00549	.02619	.00084
%RSD	1099.8	218.99	4.9982	1.2323	52.101	357.49	28.564	16.738

#1	.00042	.00026	.03075	.17122	.07477	.00426	.07037	.00478
#2	-0.00060	-0.00027	.03371	.17549	.20340	-0.00221	.08378	.00597
#3	.00004	.00066	.03121	.17357	.25408	-0.00665	.12093	.00435

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00028	.15886	.00037	-0.01288	.00130	-0.00140	-0.00511	.33249
Stddev	.00042	.02760	.00046	.01159	.00398	.00480	.00438	.00441
%RSD	147.64	17.374	123.65	90.003	307.10	343.99	85.788	1.3265

#1	.00011	.14266	.00069	-0.00453	.00509	.00157	-0.1011	.33125
#2	-0.00072	.14320	-0.00016	-0.02612	-0.00285	-0.00694	-0.00196	.32883
#3	-0.00025	.19073	.00059	-0.00800	.00165	.00118	-0.00325	.33738

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135304 Acquired: 2/27/2017 20:15:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00007	.00248	.00510	-0.00529	-0.00011	.01522	.49468
Stddev	.00059	.00016	.00423	.00113	.00056	.00022	.17456
%RSD	889.74	6.4377	82.993	21.375	491.52	1.4763	35.288

#1	-0.00060	.00263	.00031	-.00632	-.00072	.01540	.41680
#2	.00056	.00231	.00834	-.00408	.00039	.01497	.37262
#3	-.00016	.00250	.00664	-.00547	-.00001	.01530	.69463

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5187.5	70845.	8749.1
Stddev	58.9	442.	128.2
%RSD	1.1347	.62409	1.4649

#1	5119.6	71353.	8871.9
#2	5220.1	70643.	8759.3
#3	5222.9	70541.	8616.2

Approved: February 28, 2017

Ki K Beck

Sample Name: CCV Acquired: 2/27/2017 20:19:00 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40556	10.431	.40616	.50410	1.0382	.05101	10.423
Stddev	.00100	.009	.00533	.00281	.0021	.00004	.054
%RSD	.24544	.08354	1.3135	.55777	.20122	.07319	.51803

#1	.40565	10.435	.40738	.50226	1.0374	.05103	10.463
#2	.40650	10.437	.40032	.50734	1.0406	.05104	10.444
#3	.40452	10.421	.41078	.50271	1.0366	.05097	10.362

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05105	.20612	.51692	.51638	3.9962	53.604	1.0754
Stddev	.00032	.00034	.00151	.00077	.0454	.284	.0040
%RSD	.63660	.16483	.29270	.14944	1.1366	.52924	.37609

#1	.05135	.20645	.51526	.51579	3.9448	53.408	1.0791
#2	.05108	.20578	.51726	.51609	4.0310	53.929	1.0759
#3	.05071	.20614	.51823	.51725	4.0128	53.475	1.0711

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.124	.49614	1.0237	53.199	.51697	10.109	.52768
Stddev	.025	.00262	.0004	.438	.00167	.015	.00292
%RSD	.24848	.52724	.03374	.82269	.32296	.15289	.55296

#1	10.098	.49800	1.0233	52.845	.51505	10.091	.53050
#2	10.128	.49727	1.0240	53.689	.51798	10.118	.52788
#3	10.148	.49315	1.0239	53.063	.51790	10.118	.52467

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 20:19:00 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2229	4.0136	5.1009	1.0292	1.0326	1.0149	5.2163
Stddev	.0048	.00165	.0045	.0038	.0028	.0041	.00963
%RSD	.38978	.41195	.08774	.37030	.27112	.40723	1.8459

#1	1.2187	.40314	5.1007	1.0267	1.0298	1.0115	.52371
#2	1.2218	.39988	5.0964	1.0336	1.0354	1.0139	.51113
#3	1.2281	.40105	5.1054	1.0274	1.0326	1.0195	.53004

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0285	1.0336	F .66792
Stddev	.0029	.0014	.22659
%RSD	.28423	.13141	33.924

#1	1.0316	1.0348	.75611
#2	1.0281	1.0338	.41050
#3	1.0258	1.0321	.83716

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5127.1	69520.	8609.9
Stddev	33.0	303.	67.4
%RSD	.64290	.43636	.78265

#1	5105.5	69175.	8643.6
#2	5110.7	69747.	8532.3
#3	5165.0	69638.	8653.7

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 20:22:36 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00259	-0.00032	-0.00415	.00023	.00032	-0.00001	-0.01661
Stddev	.00075	.00270	.00289	.00150	.00030	.00003	.02190
%RSD	29.033	846.81	69.667	647.68	94.521	359.61	131.84

#1	-0.00310	-0.00135	-0.00350	.00170	.00063	-0.00003	-.03200
#2	-0.00173	-0.00234	-0.00730	.00029	.00031	.00002	.00846
#3	-0.00293	.00274	-0.00163	-0.00130	.00002	-0.00001	-.02629

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00001	.00004	.00037	-0.00105	-0.00546	.14657	.00203
Stddev	.00026	.00073	.00075	.00175	.00554	.06132	.00130
%RSD	2709.8	1756.0	202.68	166.50	101.46	41.839	64.144

#1	-0.00020	-0.00073	.00097	-0.00131	.00037	.21426	.00057
#2	.00028	.00072	.00062	-0.00265	-.01065	.09473	.00308
#3	-0.00012	.00013	-0.00047	.00081	-0.00610	.13071	.00243

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.06808	.00021	-0.00017	.09386	.00162	-0.00153	-0.00363
Stddev	.02947	.00037	.00092	.00787	.00148	.00109	.00352
%RSD	43.289	175.73	528.68	8.3817	91.709	71.015	97.002

#1	-0.03431	.00053	-0.00077	.10260	.00286	-0.00028	-0.00384
#2	-0.08861	.00029	.00089	.08736	.00201	-0.00215	-0.00001
#3	-0.08132	-0.00019	-0.00064	.09161	-0.00002	-0.00217	-0.00704

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 20:22:36 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00567	-0.01179	-0.00019	-0.00045	-0.00001	-0.00300	.00130
Stddev	.00714	.00813	.00241	.00157	.00035	.00404	.00630
%RSD	125.83	69.007	1293.7	346.92	3928.4	134.69	485.75

#1	-0.00001	-0.02019	-0.00266	.00091	-0.00025	.00126	.00848
#2	-0.01369	-0.01123	.00216	-0.00218	-0.00016	-0.00677	-0.00130
#3	-0.00332	-0.00395	-0.00006	-0.00009	.00039	-0.00348	-0.00329

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00001	-0.00075	F .12155
Stddev	.00039	.00011	.06972
%RSD	3038.3	14.496	57.363

#1	.00033	-0.00084	.09307
#2	.00013	-0.00063	.20100
#3	-0.00043	-0.00077	.07057

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5193.1	72127.	8936.6
Stddev	15.2	431.	93.6
%RSD	.29324	.59782	1.0470

#1	5210.3	72207.	8992.1
#2	5181.5	71661.	8989.2
#3	5187.5	72512.	8828.6

Approved: February 28, 2017

Ki K Buck

Sample Name: LLCCV Acquired: 2/27/2017 20:26:25 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.00000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00667	.18326	.00497	.07737	.00891	.00156	.40319	.00093
Stddev	.00012	.00561	.00200	.00238	.00051	.00003	.03965	.00023
%RSD	1.8478	3.0622	40.326	3.0767	5.6992	1.6350	9.8342	25.043

#1	.00678	.17801	.00380	.07510	.00908	.00153	.43608	.00069
#2	.00654	.18259	.00729	.07985	.00931	.00156	.41433	.00115
#3	.00671	.18917	.00382	.07716	.00834	.00158	.35916	.00094

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00430	.00347	.00281	.07840	.96241	.08793	.34576	.00864
Stddev	.00054	.00118	.00142	.00932	.04400	.00046	.04830	.00040
%RSD	12.552	34.024	50.327	11.883	4.5720	.52753	13.968	4.5864

#1	.00368	.00455	.00414	.06839	1.0090	.08740	.39788	.00892
#2	.00454	.00366	.00297	.07999	.95671	.08824	.30253	.00882
#3	.00467	.00221	.00133	.08682	.92153	.08816	.33687	.00819

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00796	.48064	.01839	.80913	.00768	.08020	.00815	.73975
Stddev	.00014	.01319	.00079	.00665	.00304	.00814	.00496	.00515
%RSD	1.8154	2.7443	4.2980	.82245	39.592	10.154	60.898	.69614

#1	.00797	.49087	.01801	.80393	.00565	.08893	.00341	.74196
#2	.00810	.46575	.01786	.81663	.00622	.07281	.01331	.74342
#3	.00781	.48529	.01930	.80683	.01118	.07885	.00773	.73386

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: LLCCV Acquired: 2/27/2017 20:26:25 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41645	.04185	.01903	.16533	.00876	.01895	28.724
Stddev	.00078	.00027	.00526	.00378	.00028	.00033	.926
%RSD	.18843	.64484	27.647	2.2861	3.2459	1.7183	3.2226
#1	.41594	.04172	.01349	.16105	.00844	.01867	28.665
#2	.41735	.04216	.01965	.16669	.00894	.01886	27.828
#3	.41605	.04167	.02396	.16823	.00892	.01930	29.677

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5224.6	72011.	8805.2
Stddev	24.7	877.	144.9
%RSD	.47350	1.2183	1.6454
#1	5219.9	72110.	8861.3
#2	5251.3	71089.	8913.7
#3	5202.5	72835.	8640.7

Approved: February 28, 2017

Ki K Buck

Sample Name: LLCCV Acquired: 2/27/2017 20:30:13 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.00000(
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00611	.18806	.00368	.07748	.00829	.00156	.38946	.00117
Stddev	.00142	.00434	.00372	.00196	.00125	.00001	.02499	.00028
%RSD	23.253	2.3103	101.03	2.5355	15.051	.52831	6.4157	23.869

#1	.00586	.18310	.00323	.07954	.00947	.00156	.41451	.00147
#2	.00483	.19123	.00021	.07563	.00843	.00157	.36453	.00093
#3	.00764	.18984	.00761	.07725	.00698	.00157	.38935	.00109

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00422	.00369	.00318	.07836	.92101	.08544	.41109	.00807
Stddev	.00049	.00070	.00125	.00282	.06575	.00425	.07621	.00017
%RSD	11.697	19.026	39.324	3.5980	7.1390	4.9785	18.539	2.1128

#1	.00469	.00375	.00174	.08077	.86930	.08962	.36563	.00801
#2	.00370	.00436	.00402	.07526	.99501	.08560	.36856	.00826
#3	.00428	.00296	.00379	.07906	.89872	.08112	.49908	.00794

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00738	.48837	.01700	.81193	.00771	.08187	.00919	.74018
Stddev	.00096	.02134	.00110	.00792	.00049	.00614	.00952	.00212
%RSD	12.977	4.3689	6.4711	.97572	6.3850	7.4945	103.59	.28597

#1	.00634	.51294	.01587	.81049	.00766	.07588	-.00103	.74075
#2	.00756	.47770	.01807	.80483	.00725	.08159	.01781	.74195
#3	.00823	.47448	.01707	.82047	.00823	.08814	.01078	.73784

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: LLCCV Acquired: 2/27/2017 20:30:13 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41843	.04191	.01876	.16707	.00835	.01965	28.926
Stddev	.00168	.00018	.00629	.00863	.00084	.00013	.717
%RSD	.40068	.44122	33.514	5.1685	10.022	.63975	2.4797
#1	.41684	.04184	.01664	.17311	.00922	.01951	28.136
#2	.42018	.04212	.01381	.15718	.00756	.01975	29.537
#3	.41827	.04177	.02584	.17092	.00827	.01969	29.104

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5198.7	70988.	8675.4
Stddev	9.8	922.	127.5
%RSD	.18945	1.2988	1.4702
#1	5189.8	70680.	8819.6
#2	5197.1	72024.	8629.6
#3	5209.3	70259.	8577.1

Approved: February 28, 2017

K. K. Beck

Sample Name: LLCCV Acquired: 2/27/2017 20:34:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.00000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00999	.23069	.00761	.10072	.01091	.00194	.50749	.00109
Stddev	.00306	.00406	.00867	.00378	.00029	.00005	.00849	.00026
%RSD	30.638	1.7581	113.96	3.7553	2.6469	2.3180	1.6721	24.268

#1	.00657	.23112	-.00174	.10066	.01120	.00190	.51109	.00093
#2	.01248	.23452	.01539	.10453	.01062	.00194	.51358	.00094
#3	.01090	.22644	.00918	.09697	.01091	.00199	.49780	.00140

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00530	.00481	.00476	.10983	1.1417	.10699	.47731	.00870
Stddev	.00019	.00011	.00138	.01159	.0437	.00552	.05163	.00280
%RSD	3.6433	2.2549	28.912	10.553	3.8300	5.1582	10.817	32.146

#1	.00546	.00472	.00452	.10448	1.0966	.11334	.45020	.00943
#2	.00508	.00477	.00624	.12313	1.1839	.10432	.44489	.01106
#3	.00534	.00493	.00352	.10188	1.1446	.10332	.53685	.00561

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00967	.59621	.02079	1.0086	.00576	.09866	.01520	.92485
Stddev	.00047	.01416	.00063	.0052	.00269	.00151	.00808	.00541
%RSD	4.8129	2.3755	3.0198	.51555	46.662	1.5313	53.174	.58509

#1	.01020	.59741	.02087	1.0106	.00321	.09950	.01513	.92968
#2	.00931	.58148	.02012	1.0125	.00857	.09957	.00715	.91900
#3	.00951	.60973	.02137	1.0027	.00551	.09692	.02331	.92588

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: LLCCV Acquired: 2/27/2017 20:34:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52264	.05238	.02781	.20876	.01004	.02231	35.879
Stddev	.00120	.00036	.00456	.00619	.00019	.00032	.282
%RSD	.23013	.68556	16.401	2.9654	1.8512	1.4558	.78598
#1	.52329	.05207	.02822	.21426	.00989	.02207	35.565
#2	.52126	.05277	.02306	.20206	.01025	.02268	36.110
#3	.52338	.05231	.03215	.20995	.00999	.02219	35.962

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5241.6	70663.	8723.5
Stddev	12.9	691.	101.8
%RSD	.24579	.97809	1.1675
#1	5254.1	70283.	8766.0
#2	5242.2	71460.	8797.2
#3	5228.4	70244.	8607.3

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW 58 Acquired: 2/27/2017 20:37:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00226	-0.00246	-0.00479	.00164	.00068	-0.00006	-0.00289	.00042
Stddev	.00085	.00667	.00185	.00259	.00060	.00002	.02199	.00039
%RSD	37.528	270.58	38.759	158.41	88.391	24.034	761.94	91.722

#1	-0.00276	-0.00274	-0.00416	-0.00134	.00057	-0.00007	-0.01377	.00080
#2	-0.00273	-0.00899	-0.00332	.00283	.00132	-0.00008	-0.01731	.00003
#3	-0.00128	.00434	-0.00687	.00342	.00014	-0.00005	.02242	.00043

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00003	.00027	.00072	.00019	.06644	.00140	-0.06224	-0.00115
Stddev	.00028	.00027	.00067	.00880	.02155	.00264	.05883	.00079
%RSD	842.22	102.37	92.837	4732.4	32.433	188.06	94.519	68.239

#1	-0.00030	.00058	.00106	.00446	.06623	.00376	-0.02353	-0.00188
#2	.00026	.00008	.00115	-0.00994	.04500	-0.00145	-0.12994	-0.00126
#3	-0.00006	.00014	-0.00005	.00604	.08810	.00190	-0.03326	-0.00032

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00013	.05534	.00164	-0.01185	-0.00212	-0.00691	.00139	.00424
Stddev	.00053	.00113	.00101	.00386	.00103	.00389	.01169	.00269
%RSD	420.51	2.0380	61.750	32.524	48.504	56.283	841.02	63.578

#1	.00041	.05663	.00242	-0.00810	-0.00331	-0.00312	.01450	.00441
#2	-0.00013	.05453	.00050	-0.01166	-0.00156	-0.01089	-0.00796	.00146
#3	-0.00066	.05486	.00201	-0.01580	-0.00150	-0.00673	-0.00237	.00684

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW 58 Acquired: 2/27/2017 20:37:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00061	.00028	-.00418	-.00967	-.00106	.00059	.11898
Stddev	.00148	.00008	.00106	.00212	.00047	.00017	.24481
%RSD	243.10	29.802	25.396	21.897	44.399	28.859	205.76

#1	-.00051	.00036	-.00348	-.01207	-.00091	.00077	.33910
#2	.00005	.00030	-.00366	-.00891	-.00159	.00043	.16251
#3	.00229	.00019	-.00541	-.00804	-.00069	.00057	-.14467

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5227.1	72776.	8696.3
Stddev	14.7	205.	57.5
%RSD	.28108	.28158	.66096

#1	5210.5	72884.	8635.8
#2	5238.5	72904.	8702.8
#3	5232.3	72539.	8750.2

Approved: February 28, 2017

Ki K Beck

Sample Name: LCSW 58 Acquired: 2/27/2017 20:41:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19469	5.1363	.18917	.90770	.50432	.02402	5.0140	.02438
Stddev	.00058	.0107	.00137	.00107	.00077	.00007	.0176	.00015
%RSD	.29691	.20846	.72518	.11784	.15325	.27948	.35075	.62572

#1	.19428	5.1297	.19039	.90800	.50512	.02401	4.9937	.02422
#2	.19444	5.1307	.18769	.90651	.50428	.02395	5.0244	.02439
#3	.19535	5.1487	.18942	.90859	.50357	.02409	5.0240	.02452

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10030	.24848	.24698	1.9187	25.787	.52236	4.8222	.23790
Stddev	.00048	.00115	.00169	.0103	.067	.00363	.0596	.00185
%RSD	.48112	.46357	.68543	.53477	.26074	.69443	1.2354	.77829

#1	.09979	.24965	.24506	1.9068	25.839	.52646	4.8718	.23579
#2	.10075	.24844	.24826	1.9245	25.810	.52108	4.7561	.23924
#3	.10036	.24735	.24761	1.9247	25.711	.51955	4.8388	.23868

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49608	25.877	.25116	4.7432	.24903	.57207	.18015	2.4634
Stddev	.00220	.074	.00197	.0193	.00538	.00446	.00408	.0045
%RSD	.44330	.28685	.78553	.40602	2.1599	.77958	2.2644	.18248

#1	.49469	25.926	.25178	4.7210	.24492	.57034	.18412	2.4633
#2	.49861	25.915	.24896	4.7544	.25512	.57714	.18035	2.4590
#3	.49493	25.792	.25276	4.7542	.24706	.56874	.17597	2.4680

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: LCSW 58 Acquired: 2/27/2017 20:41:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-03

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49819	.50051	.48967	.25189	.49488	.49141	.34699
Stddev	.00129	.00063	.00485	.00573	.00114	.00078	.16061
%RSD	.25957	.12509	.99092	2.2760	.23090	.15793	46.287
#1	.49673	.50122	.48917	.25455	.49386	.49122	.53234
#2	.49861	.50004	.49476	.24531	.49612	.49226	.24905
#3	.49921	.50027	.48509	.25581	.49468	.49074	.25957

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5194.5	71132.	8899.4
Stddev	28.2	180.	25.4
%RSD	.54317	.25321	.28544
#1	5176.1	71168.	8919.8
#2	5180.4	71292.	8907.3
#3	5226.9	70937.	8870.9

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702125302 Acquired: 2/27/2017 20:45:21 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00189	.04925	.01153	.06270	2.9898	.00019	F 1150.1
Stddev	.00107	.00635	.00747	.00225	.0069	.00012	1.1
%RSD	56.361	12.903	64.791	3.5898	.22942	62.647	.09524

#1	-0.00142	.04596	.01016	.06333	2.9885	.00029	1150.5
#2	-0.00312	.05657	.01958	.06021	2.9972	.00006	1148.9
#3	-0.00115	.04520	.00484	.06458	2.9837	.00024	1151.0

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00443	.00153	.00044	.04396	-.00053	109.13	.44483
Stddev	.00037	.00010	.00088	.00089	.01174	.24	.00336
%RSD	8.3686	6.5933	197.67	2.0305	2235.7	.21886	.75517

#1	.00401	.00164	.00105	.04486	.00794	108.88	.44730
#2	.00463	.00150	.00085	.04308	.00442	109.16	.44617
#3	.00466	.00144	-.00056	.04396	-.01393	109.36	.44100

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00799	.00006	.00906	50.745	2.4021	.11198	-.00205
Stddev	.05831	.00209	.00047	.135	.0039	.00488	.00339
%RSD	729.96	3513.0	5.2063	.26661	.16198	4.3574	165.17

#1	.02947	.00180	.00941	50.591	2.3993	.11058	-.00047
#2	.02174	.00064	.00925	50.844	2.4065	.11740	-.00595
#3	-.07518	-.00226	.00853	50.801	2.4005	.10795	.00026

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702125302 Acquired: 2/27/2017 20:45:21 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02147	F -.03638	2.7784	.00322	4.2563	F -.10067	F -.01248
Stddev	.01245	.00946	.0066	.00199	.0122	.00175	.00666
%RSD	57.971	25.994	.23596	61.753	.28590	1.7364	53.373

#1	-.00769	-.04076	2.7730	.00522	4.2580	-.10226	-.00920
#2	-.03190	-.04285	2.7765	.00125	4.2675	-.10095	-.02015
#3	-.02482	-.02553	2.7857	.00318	4.2433	-.09879	-.00810

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit	45.000	90.000				36.000	
Low Limit	-.02000	-.01000				-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.01149	.02661	F -.36531
Stddev	.00044	.00038	.27990
%RSD	3.8595	1.4141	76.622

#1	.01151	.02619	-.04702
#2	.01104	.02670	-.47580
#3	.01193	.02692	-.57310

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4452.7	60816.	8493.0
Stddev	12.5	377.	147.4
%RSD	.28040	.62016	1.7359

#1	4462.9	60969.	8622.7
#2	4438.8	60387.	8523.6
#3	4456.5	61093.	8332.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126501 Acquired: 2/27/2017 20:49:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00071	1.8225	-0.00602	.01047	.08905	.00003	53.065	.00035
Stddev	.00162	.0144	.00254	.00465	.00028	.00009	.112	.00032
%RSD	228.02	.78881	42.237	44.462	.31448	344.56	.21093	91.882

#1	-0.00088	1.8186	-0.00359	.00590	.08925	-0.00001	53.005	.00042
#2	.00099	1.8384	-0.00580	.01030	.08873	-0.00004	52.997	.00063
#3	-0.00224	1.8104	-0.00866	.01521	.08917	.00013	53.195	-0.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00084	.00206	.00171	1.4483	1.5643	.00744	8.5117	.07969
Stddev	.00015	.00072	.00138	.0075	.0328	.00330	.0732	.00095
%RSD	17.612	35.062	80.431	.51722	2.0985	44.343	.86033	1.1970

#1	.00092	.00242	.00330	1.4534	1.5495	.00588	8.4581	.08062
#2	.00093	.00123	.00090	1.4517	1.6020	.00521	8.5951	.07871
#3	.00067	.00254	.00094	1.4397	1.5415	.01123	8.4818	.07972

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00015	3.5947	.00282	.04303	-0.00381	-0.00872	.00247	4.9678
Stddev	.00011	.0036	.00016	.00206	.00438	.00182	.01635	.0180
%RSD	68.571	.10116	5.6900	4.7807	114.94	20.842	663.27	.36318

#1	-0.00025	3.5907	.00269	.04076	.00115	-0.00980	.01793	4.9717
#2	-0.00016	3.5977	.00300	.04359	-0.00714	-0.00973	-.01465	4.9836
#3	-0.00004	3.5956	.00276	.04476	-0.00543	-0.00662	.00411	4.9481

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126501 Acquired: 2/27/2017 20:49:14 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00074	.22030	.03682	-.00216	.00269	.00514	1.0051
Stddev	.00224	.00043	.00401	.00393	.00067	.00031	.3207
%RSD	302.02	.19431	10.882	181.54	25.097	5.9962	31.906

#1	-.00120	.22025	.03237	-.00233	.00329	.00481	1.3462
#2	.00320	.21990	.03796	.00185	.00196	.00521	.70971
#3	.00023	.22075	.04013	-.00600	.00282	.00541	.95943

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5207.1	71511.	8904.2
Stddev	72.9	488.	73.1
%RSD	1.4004	.68242	.82131

#1	5285.3	71576.	8981.1
#2	5195.0	70994.	8835.5
#3	5141.0	71963.	8895.9

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126502 Acquired: 2/27/2017 20:53:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00214	.01550	-0.00486	.00941	.11837	.00001	65.775	.00036
Stddev	.00146	.00246	.00460	.00172	.00033	.00005	.020	.00030
%RSD	68.412	15.865	94.646	18.285	.27523	445.55	.03085	83.971

#1	-0.00324	.01266	-0.00100	.00844	.11807	.00006	65.766	.00009
#2	-0.00048	.01679	-0.00364	.01140	.11872	-0.00004	65.798	.00030
#3	-0.00270	.01705	-0.00995	.00839	.11831	.00001	65.760	.00069

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00008	-0.00028	.00147	.01721	.98583	.00493	8.5595	.00119
Stddev	.00044	.00039	.00228	.01825	.05812	.00297	.0458	.00053
%RSD	535.37	138.29	154.64	106.07	5.8951	60.229	.53482	44.382

#1	-0.00040	-0.00073	.00121	.03108	1.0442	.00180	8.5438	.00070
#2	.00021	-0.00002	-0.00066	-0.00347	.92800	.00771	8.6110	.00174
#3	.00044	-0.00009	.00387	.02402	.98527	.00529	8.5236	.00112

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00082	4.2578	.00153	-0.00851	-0.00050	-0.00893	-0.00735	3.2271
Stddev	.00074	.0176	.00141	.00579	.00400	.00892	.00451	.0052
%RSD	90.073	.41208	92.302	67.983	801.78	99.938	61.361	.16248

#1	.00146	4.2375	.00234	-0.00188	-0.00040	.00135	-0.00829	3.2332
#2	.00100	4.2687	.00235	-0.01109	.00345	-0.01467	-0.00244	3.2245
#3	.00001	4.2670	-0.00010	-0.01256	-0.00454	-0.01346	-0.01132	3.2238

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126502 Acquired: 2/27/2017 20:53:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00042	.22821	-.00877	-.00494	.00083	.00394	.21719
Stddev	.00081	.00091	.00455	.00843	.00091	.00005	.18798
%RSD	192.46	.39956	51.841	170.80	109.55	1.3083	86.551

#1	.00134	.22756	-.01203	.00133	.00085	.00400	.25658
#2	-.00022	.22925	-.01071	-.00162	-.00009	.00393	.38235
#3	.00015	.22782	-.00358	-.01453	.00174	.00390	.01264

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5165.9	71290.	8683.5
Stddev	57.5	1032.	44.7
%RSD	1.1133	1.4473	.51521

#1	5230.2	70508.	8662.1
#2	5148.4	70903.	8734.9
#3	5119.3	72459.	8653.5

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126503 Acquired: 2/27/2017 20:56:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00171	.08911	-0.00495	.01285	.08377	.00001	58.276
Stddev	.00045	.00165	.00536	.00152	.00094	.00005	.210
%RSD	26.168	1.8524	108.27	11.868	1.1167	640.90	.36107

#1	-0.00151	.08922	-0.00110	.01190	.08458	.00001	58.518
#2	-0.00139	.08740	-0.00268	.01460	.08275	-0.00004	58.135
#3	-0.00222	.09070	-0.01106	.01203	.08399	.00006	58.176

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00050	-0.00007	.00038	-0.00012	.05274	1.8956	.00675
Stddev	.00050	.00030	.00099	.00086	.02585	.0844	.00260
%RSD	99.678	430.43	264.22	697.04	49.020	4.4517	38.505

#1	.00003	.00003	-0.00019	-0.00033	.04732	1.9035	.00491
#2	.00045	.00017	.00152	.00082	.08087	1.8075	.00562
#3	.00103	-0.00041	-0.00021	-0.00086	.03002	1.9757	.00972

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.8090	.00364	.00042	8.6321	.00242	.00531	F -.00612
Stddev	.0981	.00170	.00024	.0820	.00088	.01032	.00293
%RSD	1.1138	46.863	56.033	.94957	36.488	194.35	47.976

#1	8.9107	.00416	.00069	8.7105	.00141	-0.00541	-.00296
#2	8.7150	.00173	.00024	8.5470	.00303	.00615	-.00876
#3	8.8012	.00502	.00034	8.6386	.00282	.01519	-.00663

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							225.00
Low Limit							-.00500

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126503 Acquired: 2/27/2017 20:56:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00658	-0.00510	2.8939	-0.00041	.17616	-0.00729	-0.00633
Stddev	.00447	.00393	.0067	.00108	.00055	.00121	.00449
%RSD	68.012	77.045	.23016	263.34	.30988	16.651	70.956

#1	-.01173	-.00675	2.8891	-.00028	.17664	-.00860	-.01082
#2	-.00436	-.00795	2.9015	.00060	.17556	-.00704	-.00183
#3	-.00365	-.00062	2.8912	-.00155	.17628	-.00621	-.00635

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00086	.00218	.32118
Stddev	.00017	.00020	.20486
%RSD	19.240	9.3261	63.783

#1	.00100	.00241	.32595
#2	.00068	.00203	.52361
#3	.00089	.00210	.11398

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5121.5	71532.	8845.5
Stddev	56.9	955.	136.9
%RSD	1.1106	1.3355	1.5480

#1	5117.4	72491.	8689.2
#2	5180.3	71527.	8944.7
#3	5066.7	70580.	8902.4

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126504 Acquired: 2/27/2017 21:00:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00132	.03863	-0.00452	.01751	.05101	-0.00007	43.031
Stddev	.00123	.00372	.00423	.00155	.00051	.00000	.105
%RSD	92.860	9.6231	93.577	8.8740	1.0038	6.2593	.24483

#1	-0.00238	.03668	-0.00268	.01705	.05148	-0.00007	42.920
#2	.00003	.04292	-0.00152	.01624	.05046	-0.00008	43.042
#3	-0.00163	.03629	-0.00936	.01924	.05108	-0.00007	43.130

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00030	.00031	-0.00013	-0.00071	.00863	3.0836	.00648
Stddev	.00042	.00062	.00080	.00019	.00811	.0436	.00695
%RSD	137.39	200.64	601.04	26.551	93.980	1.4145	107.25

#1	-0.00003	.00075	.00005	-0.00091	.01667	3.0542	.00419
#2	.00018	.00058	-0.00101	-0.00068	.00045	3.1337	.00097
#3	.00077	-0.00040	.00056	-0.00054	.00876	3.0629	.01429

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.2948	.00019	.00098	4.7435	.00139	.02373	F -.00575
Stddev	.0666	.00297	.00055	.0127	.00063	.01079	.00130
%RSD	1.5509	1557.5	56.252	.26661	45.634	45.460	22.678

#1	4.2218	-0.00305	.00161	4.7338	.00120	.03599	-0.00542
#2	4.3103	.00086	.00067	4.7578	.00087	.01950	-0.00464
#3	4.3523	.00277	.00065	4.7389	.00210	.01570	-0.00718

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							225.00
Low Limit							-0.00500

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126504 Acquired: 2/27/2017 21:00:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00281	-0.00224	2.5578	.00103	.09993	-0.00260	-0.00737
Stddev	.00844	.00199	.0091	.00124	.00020	.00196	.00712
%RSD	299.97	88.945	.35736	120.25	.19885	75.344	96.547

#1	-0.01256	-0.00280	2.5492	-0.00027	.09989	-0.00476	-0.01234
#2	.00219	-0.00003	2.5569	.00116	.09975	-0.00093	-0.01055
#3	.00193	-0.00390	2.5674	.00219	.10014	-0.00211	.00078

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00030	.00144	F -0.05912
Stddev	.00083	.00007	.17053
%RSD	275.49	5.1218	288.42

#1	-0.00015	.00141	-0.01028
#2	.00044	.00153	.08165
#3	-0.00120	.00139	-0.24875

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-0.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5146.3	70692.	8785.6
Stddev	40.2	480.	50.6
%RSD	.78089	.67915	.57649

#1	5114.7	70431.	8843.5
#2	5132.7	70399.	8749.3
#3	5191.5	71246.	8764.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126505 Acquired: 2/27/2017 21:04:20 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00265	.07225	-0.00664	.01254	.08833	.00001	76.834
Stddev	.00188	.00717	.00476	.00246	.00048	.00003	.432
%RSD	70.751	9.9296	71.593	19.596	.54417	635.28	.56239

#1	-0.00447	.07401	-0.00461	.01356	.08799	-0.00002	76.987
#2	-0.00072	.07837	-0.01208	.01431	.08812	.00004	76.346
#3	-0.00277	.06436	-0.00324	.00973	.08888	-0.00001	77.169

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00048	.00003	.00012	-0.00073	.03900	1.4573	.00351
Stddev	.00028	.00047	.00037	.00082	.01148	.0577	.00302
%RSD	59.215	1408.2	319.85	111.29	29.442	3.9595	86.194

#1	.00074	.00009	.00017	-0.00114	.04031	1.4835	.00689
#2	.00018	-0.00046	-0.00028	-0.00127	.02692	1.3911	.00257
#3	.00050	.00048	.00046	.00021	.04977	1.4972	.00107

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.708	.00286	.00062	6.5889	.00121	.00590	-0.00209
Stddev	.068	.00110	.00081	.0104	.00065	.00481	.00167
%RSD	.63656	38.545	131.78	.15751	53.876	81.540	79.854

#1	10.724	.00204	.00021	6.5783	.00193	.00254	-0.00230
#2	10.633	.00243	.00155	6.5990	.00066	.01141	-0.00032
#3	10.766	.00412	.00009	6.5894	.00104	.00374	-0.00364

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126505 Acquired: 2/27/2017 21:04:20 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00414	-0.00521	2.9552	.00085	.28169	-0.00745	-0.00496
Stddev	.00822	.00413	.0096	.00106	.00055	.00664	.00395
%RSD	198.52	79.208	.32631	123.92	.19529	89.095	79.765

#1	-.01242	-.00829	2.9620	-.00037	.28206	-.00027	-.00682
#2	.00401	-.00682	2.9594	.00145	.28106	-.00871	-.00764
#3	-.00400	-.00052	2.9442	.00148	.28195	-.01337	-.00042

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00075	.00063	F -.10854
Stddev	.00005	.00006	.12335
%RSD	6.4753	9.1360	113.64

#1	.00073	.00059	-.13879
#2	.00071	.00059	-.21396
#3	.00080	.00069	.02711

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5138.2	70898.	8793.9
Stddev	30.4	368.	41.4
%RSD	.59113	.51908	.47058

#1	5122.8	71245.	8809.8
#2	5173.2	70939.	8824.9
#3	5118.7	70512.	8746.9

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126505PS Acquired: 2/27/2017 21:08:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604323-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19560	5.0946	.19910	.95190	.58333	.02483	72.687	.02472
Stddev	.00046	.0144	.00440	.00838	.00193	.00005	.050	.00040
%RSD	.23505	.28346	2.2082	.88033	.33157	.18395	.06872	1.6248

#1	.19513	5.1022	.20351	.94369	.58236	.02478	72.693	.02451
#2	.19605	5.1037	.19472	.96044	.58555	.02487	72.733	.02518
#3	.19561	5.0780	.19907	.95157	.58206	.02484	72.634	.02447

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09932	.24942	.24880	1.9374	27.630	.52768	14.307	.23951
Stddev	.00038	.00166	.00155	.0056	.064	.00415	.023	.00160
%RSD	.38258	.66518	.62140	.28638	.23264	.78583	.15826	.66765

#1	.09975	.24801	.25034	1.9399	27.612	.52289	14.308	.23963
#2	.09907	.24901	.24725	1.9310	27.701	.53003	14.284	.24104
#3	.09913	.25125	.24881	1.9413	27.576	.53012	14.329	.23785

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50048	31.976	.25120	4.9586	.25281	.58135	.18925	5.1672
Stddev	.00211	.135	.00192	.0033	.00306	.00322	.00348	.0023
%RSD	.42088	.42242	.76462	.06599	1.2123	.55315	1.8397	.04378

#1	.49807	32.132	.25006	4.9576	.25633	.57817	.19292	5.1660
#2	.50142	31.901	.25341	4.9560	.25135	.58460	.18599	5.1658
#3	.50195	31.895	.25012	4.9623	.25075	.58127	.18884	5.1699

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126505PS Acquired: 2/27/2017 21:08:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604323-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50123	.75197	.48705	.24959	.50154	.49582	.54506
Stddev	.00106	.00070	.00226	.00475	.00069	.00038	.27596
%RSD	.21114	.09339	.46425	1.9048	.13836	.07620	50.630
#1	.50039	.75175	.48963	.25498	.50226	.49541	.78598
#2	.50089	.75275	.48538	.24784	.50087	.49615	.24398
#3	.50242	.75140	.48615	.24597	.50149	.49591	.60523

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5159.7	70377.	8853.0
Stddev	6.1	85.	21.8
%RSD	.11848	.12128	.24601
#1	5158.0	70347.	8828.0
#2	5166.4	70473.	8867.9
#3	5154.5	70310.	8863.1

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126505SDL Acquired: 2/27/2017 21:11:48 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604323-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00294	.02088	-.00001	.00517	.01798	-.00002	15.872
Stddev	.00206	.00385	.00349	.00251	.00069	.00002	.027
%RSD	70.209	18.436	69037.	48.681	3.8478	86.264	.16717

#1	-.00154	.02360	.00256	.00284	.01736	-.00000	15.857
#2	-.00197	.01647	-.00397	.00482	.01784	-.00005	15.856
#3	-.00531	.02256	.00140	.00784	.01872	-.00003	15.902

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00003	.00026	.00048	.00012	.00507	.41732	.00283
Stddev	.00008	.00026	.00099	.00110	.00980	.08763	.00233
%RSD	248.16	101.92	207.95	892.35	193.35	20.997	82.210

#1	-.00005	.00019	.00122	.00123	.00262	.40536	.00015
#2	.00006	.00004	.00085	-.00098	-.00327	.51031	.00433
#3	-.00010	.00055	-.00065	.00012	.01586	.33629	.00401

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.1947	.00130	-.00011	1.3663	.00097	.00689	-.00086
Stddev	.0705	.00095	.00012	.0291	.00335	.00181	.00486
%RSD	3.2142	73.393	102.85	2.1320	343.61	26.244	565.89

#1	2.1273	.00056	.00002	1.3985	.00483	.00772	.00063
#2	2.2680	.00096	-.00016	1.3418	-.00073	.00813	-.00629
#3	2.1887	.00238	-.00020	1.3586	-.00118	.00481	.00308

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126505SDL Acquired: 2/27/2017 21:11:48 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604323-02

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00733	-0.00401	.60694	.00196	.05674	-0.00249	-0.00413
Stddev	.00586	.00845	.00228	.00051	.00020	.00182	.00513
%RSD	79.956	210.37	.37487	26.189	.34425	73.007	124.39

#1	-0.00197	.00398	.60728	.00187	.05656	-0.00447	-0.01003
#2	-0.01359	-0.01285	.60903	.00150	.05695	-0.00212	-0.00071
#3	-0.00643	-0.00317	.60452	.00252	.05670	-0.00089	-0.00165

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00070	.00054	F -.06286
Stddev	.00062	.00023	.19212
%RSD	89.506	43.565	305.62

#1	-0.00080	.00038	-.02634
#2	-0.00127	.00042	.10838
#3	-0.00003	.00081	-.27063

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5350.0	73327.	8812.9
Stddev	20.1	72.	60.0
%RSD	.37625	.09835	.68049

#1	5361.9	73360.	8750.0
#2	5326.8	73244.	8819.1
#3	5361.4	73377.	8869.5

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 21:15:36 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41011	10.518	.41263	.51071	1.0460	.05142	10.446
Stddev	.00256	.017	.00102	.00222	.0017	.00016	.043
%RSD	.62360	.16183	.24742	.43383	.15730	.31254	.41070

#1	.41036	10.519	.41191	.50816	1.0478	.05130	10.481
#2	.41253	10.500	.41218	.51173	1.0459	.05135	10.398
#3	.40744	10.534	.41380	.51223	1.0445	.05160	10.457

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05132	.20697	.52038	.52045	3.9859	54.160	1.0708
Stddev	.00046	.00106	.00173	.00292	.0043	.097	.0022
%RSD	.89571	.51129	.33334	.56039	.10748	.17850	.20678

#1	.05083	.20670	.51996	.51849	3.9881	54.115	1.0723
#2	.05139	.20814	.52229	.51906	3.9886	54.093	1.0718
#3	.05174	.20607	.51890	.52380	3.9809	54.270	1.0682

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.053	.48996	1.0275	53.546	.52230	10.392	.52883
Stddev	.122	.00472	.0008	.142	.00121	.025	.00491
%RSD	1.2103	.96345	.07936	.26512	.23223	.23745	.92915

#1	9.9182	.49138	1.0266	53.425	.52144	10.367	.52655
#2	10.155	.49382	1.0282	53.512	.52368	10.393	.52547
#3	10.085	.48470	1.0276	53.702	.52177	10.417	.53447

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 21:15:36 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2346	.40516	5.1714	1.0452	1.0402	1.0253	.52624
Stddev	.0101	.01408	.0033	.0021	.0001	.0063	.00674
%RSD	.82158	3.4750	.06348	.20403	.01344	.61528	1.2800

#1	1.2460	.41020	5.1734	1.0459	1.0401	1.0211	.52117
#2	1.2267	.38925	5.1732	1.0469	1.0403	1.0221	.53388
#3	1.2310	.41602	5.1676	1.0428	1.0402	1.0325	.52367

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0338	1.0491	F .88937
Stddev	.0004	.0005	.04853
%RSD	.04322	.04615	5.4567

#1	1.0334	1.0486	.84711
#2	1.0336	1.0496	.87863
#3	1.0343	1.0493	.94237

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5145.3	70129.	8787.0
Stddev	26.1	321.	17.3
%RSD	.50694	.45746	.19642

#1	5126.4	70400.	8767.8
#2	5134.4	70211.	8792.1
#3	5175.0	69775.	8801.2

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 21:19:12 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00096	.00089	-0.00740	.00264	-0.00047	-0.00002	-0.01143
Stddev	.00109	.00349	.00522	.00271	.00074	.00005	.00366
%RSD	113.58	390.50	70.506	102.62	156.10	216.43	31.994

#1	.00013	-.00126	-.00256	.00152	-.00128	.00003	-.01438
#2	-.00206	.00492	-.01293	.00067	.00017	-.00007	-.00734
#3	-.00096	-.00098	-.00672	.00574	-.00031	-.00003	-.01257

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00031	.00013	-0.00020	-0.00054	-0.01119	.19744	.00308
Stddev	.00018	.00032	.00122	.00178	.00858	.04431	.00103
%RSD	57.957	257.03	623.71	329.70	76.634	22.442	33.316

#1	.00037	.00049	-.00077	-.00241	-.01955	.24744	.00281
#2	.00011	.00001	-.00102	.00113	-.00241	.16304	.00421
#3	.00045	-.00013	.00120	-.00034	-.01161	.18184	.00221

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.05009	.00046	.00008	.05518	.00262	.00221	-0.00155
Stddev	.03521	.00145	.00108	.02976	.00064	.00825	.00152
%RSD	70.292	314.88	1291.5	53.944	24.526	373.94	98.033

#1	-.03628	.00100	.00127	.03080	.00282	-.00700	-.00005
#2	-.09011	.00157	-.00018	.08835	.00190	.00470	-.00151
#3	-.02388	-.00119	-.00084	.04638	.00313	.00893	-.00309

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 21:19:12 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00999	-0.01328	.00003	.00046	.00021	-0.00161	-0.00572
Stddev	.00390	.00918	.00045	.00141	.00029	.00373	.00531
%RSD	39.052	69.126	1655.5	305.32	135.72	231.93	92.850

#1	-0.01369	-0.02313	.00050	.00041	.00007	-0.00042	-0.00873
#2	-0.00592	-0.00496	-0.00039	.00190	.00055	-0.00579	.00041
#3	-0.01036	-0.01176	-0.00003	-0.00092	.00003	.00139	-0.00884

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00020	-0.00047	F .15232
Stddev	.00076	.00009	.06180
%RSD	383.83	19.538	40.573

#1	-0.00057	-0.00054	.13726
#2	-0.00069	-0.00036	.22025
#3	.00068	-0.00049	.09944

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5243.3	72518.	8741.2
Stddev	14.9	254.	57.8
%RSD	.28481	.35071	.66071

#1	5240.6	72742.	8801.2
#2	5259.4	72570.	8736.5
#3	5230.0	72241.	8686.0

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126506 Acquired: 2/27/2017 21:23:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00316	.09058	-0.00475	.01009	.05683	.00002	49.196	.00024
Stddev	.00046	.00737	.00316	.00006	.00050	.00005	.098	.00026
%RSD	14.554	8.1307	66.628	.54629	.87255	267.81	.20010	110.18

#1	-0.00366	.08855	-0.00167	.01003	.05635	-0.00001	49.091	.00053
#2	-0.00307	.09875	-0.00799	.01014	.05734	.00007	49.287	.00013
#3	-0.00275	.08445	-0.00459	.01010	.05680	-0.00001	49.210	.00004

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00046	-0.00101	-0.00070	.03945	1.4866	.00554	6.4542	.00445
Stddev	.00044	.00025	.00120	.00481	.0820	.00071	.0624	.00194
%RSD	95.742	25.254	171.88	12.190	5.5192	12.895	.96675	43.642

#1	.00092	-0.00078	.00054	.03607	1.5621	.00490	6.4605	.00432
#2	.00043	-0.00096	-0.00079	.03731	1.4983	.00631	6.5133	.00645
#3	.00004	-0.00128	-0.00184	.04495	1.3993	.00540	6.3889	.00258

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00055	4.9545	-0.00076	.00194	-0.00128	-0.00721	-0.00407	2.5177
Stddev	.00094	.0091	.00168	.00275	.00621	.00069	.01054	.0053
%RSD	171.24	.18368	221.34	141.84	486.47	9.5534	259.29	.20900

#1	.00124	4.9482	.00112	.00446	-0.00682	-0.00739	-0.00114	2.5190
#2	-0.00052	4.9649	-0.00129	.00234	-0.00245	-0.00645	.00470	2.5222
#3	.00093	4.9503	-0.00211	-0.00099	.00544	-0.00780	-0.01576	2.5119

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126506 Acquired: 2/27/2017 21:23:01 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00038	.13881	-0.00319	-0.00717	-0.00010	.01956	.18132
Stddev	.00107	.00033	.00414	.00358	.00067	.00005	.18509
%RSD	284.94	.23784	129.72	49.889	699.20	.27440	102.08

#1	.00104	.13917	.00126	-.00438	-.00078	.01954	.04598
#2	.00095	.13874	-.00391	-.01120	.00056	.01953	.10575
#3	-.00086	.13852	-.00692	-.00594	-.00006	.01963	.39223

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5230.4	71585.	8740.5
Stddev	12.6	1004.	54.7
%RSD	.24081	1.4024	.62629

#1	5229.8	70465.	8797.4
#2	5218.1	71887.	8688.2
#3	5243.3	72404.	8736.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126601 Acquired: 2/27/2017 21:26:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00143	.24176	-0.00450	.01238	.08123	-0.00007	62.905	.00056
Stddev	.00117	.00247	.00498	.00198	.00042	.00003	.175	.00036
%RSD	81.769	1.0225	110.60	15.979	.52040	47.930	.27826	63.812

#1	-0.00122	.24040	-0.00420	.01082	.08076	-0.00004	62.952	.00079
#2	-0.00269	.24462	.00032	.01171	.08134	-0.00006	62.711	.00015
#3	-0.00038	.24028	-0.00963	.01461	.08159	-0.00010	63.052	.00074

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	.00022	.00221	.29153	1.5055	.00669	9.8268	.00662
Stddev	.00054	.00065	.00189	.01308	.0248	.00481	.0897	.00160
%RSD	583.64	291.56	85.279	4.4871	1.6450	71.911	.91282	24.133

#1	-0.00028	.00035	.00303	.29705	1.4905	.00520	9.8395	.00559
#2	-0.00016	-0.00048	.00005	.27659	1.5341	.01207	9.9095	.00847
#3	.00072	.00080	.00355	.30094	1.4919	.00280	9.7314	.00582

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00195	3.0087	.00279	.01152	-0.00341	-0.01146	-0.00145	4.4007
Stddev	.00076	.0128	.00260	.00556	.00333	.00620	.00676	.0037
%RSD	39.113	.42398	93.201	48.260	97.753	54.122	465.02	.08440

#1	.00161	3.0045	.00025	.01555	.00044	-0.01075	.00539	4.4032
#2	.00283	2.9986	.00544	.00518	-0.00526	-0.00565	-0.00162	4.4025
#3	.00142	3.0230	.00268	.01384	-0.00540	-0.01799	-0.00812	4.3964

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126601 Acquired: 2/27/2017 21:26:47 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00007	.16985	.00028	-.00673	.00063	.00148	.04801
Stddev	.00071	.00016	.00300	.00542	.00017	.00013	.18204
%RSD	957.25	.09338	1087.5	80.627	27.488	9.0478	379.20

#1	-.00036	.17003	.00248	-.00589	.00083	.00138	.05315
#2	-.00032	.16977	.00148	-.00177	.00053	.00163	-.13655
#3	.00090	.16975	-.00313	-.01252	.00053	.00142	.22742

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5214.3	71662.	8766.5
Stddev	16.5	180.	70.4
%RSD	.31726	.25121	.80354

#1	5195.4	71835.	8686.0
#2	5221.2	71476.	8816.6
#3	5226.3	71674.	8796.9

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126602 Acquired: 2/27/2017 21:30:33 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00218	.49947	-0.00495	.00855	.06541	-0.00007	57.021	.00028
Stddev	.00135	.00557	.00360	.00403	.00042	.00004	.053	.00036
%RSD	62.275	1.1153	72.648	47.146	.64135	62.143	.09250	127.70

#1	-0.00085	.50510	-0.00682	.00478	.06514	-0.00004	57.076	.00005
#2	-0.00356	.49935	-0.00081	.00806	.06589	-0.00012	57.015	.00010
#3	-0.00212	.49396	-0.00723	.01280	.06520	-0.00005	56.971	.00069

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	.00058	.00102	.23209	.92357	.00619	9.7384	.00958
Stddev	.00004	.00103	.00122	.01447	.02404	.00214	.0858	.00213
%RSD	41.701	178.28	119.44	6.2367	2.6031	34.516	.88140	22.186

#1	.00005	.00057	.00057	.21965	.95127	.00864	9.7387	.01193
#2	.00013	-.00045	.00240	.22863	.91132	.00474	9.8240	.00904
#3	.00009	.00162	.00009	.24798	.90812	.00518	9.6523	.00778

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00049	2.2885	.00134	.00991	-.00221	-.00487	-.00355	3.9816
Stddev	.00111	.0237	.00181	.00062	.00447	.00329	.00556	.0134
%RSD	224.47	1.0358	135.28	6.3034	202.14	67.408	156.59	.33602

#1	.00038	2.2929	.00342	.01021	.00060	-.00696	.00089	3.9959
#2	-.00055	2.2629	.00014	.01033	.00013	-.00657	-.00175	3.9794
#3	.00165	2.3096	.00045	.00920	-.00737	-.00109	-.00979	3.9694

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126602 Acquired: 2/27/2017 21:30:33 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00019	.14859	.00324	-.00199	.00093	.00121	.37535
Stddev	.00087	.00034	.00296	.00197	.00058	.00010	.03119
%RSD	455.70	.23164	91.536	99.017	61.800	8.2029	8.3095

#1	-.00080	.14851	.00049	-.00304	.00156	.00124	.34490
#2	.00054	.14829	.00284	.00028	.00080	.00110	.37394
#3	.00084	.14896	.00637	-.00321	.00043	.00129	.40723

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5231.8	72311.	8845.0
Stddev	5.2	305.	45.5
%RSD	.09984	.42163	.51436

#1	5228.2	72295.	8832.1
#2	5237.8	72623.	8895.6
#3	5229.5	72014.	8807.4

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126701 Acquired: 2/27/2017 21:34:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00236	.03383	-0.00260	.02003	.46358	-0.00001	21.991	.00053
Stddev	.00122	.00112	.00154	.00337	.00076	.00004	.139	.00009
%RSD	51.587	3.2991	59.191	16.846	.16466	454.74	.63229	16.801

#1	-0.00109	.03258	-0.00196	.02123	.46351	-0.00005	21.977	.00044
#2	-0.00246	.03416	-0.00149	.02264	.46438	.00001	22.136	.00053
#3	-0.00352	.03474	-0.00436	.01622	.46286	.00002	21.859	.00062

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00056	-0.00101	.00224	5.5181	1.2223	.00394	3.0530	2.0955
Stddev	.00031	.00083	.00109	.0233	.0216	.00212	.0479	.0049
%RSD	54.260	81.703	48.704	.42222	1.7659	53.855	1.5681	.23594

#1	.00021	-0.00061	.00203	5.5130	1.2016	.00159	3.0308	2.0900
#2	.00072	-0.00196	.00342	5.4978	1.2207	.00573	3.1080	2.0972
#3	.00076	-0.00046	.00126	5.5435	1.2447	.00450	3.0203	2.0994

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00392	26.095	.00076	.01615	-0.00191	-0.01011	.00017	3.0693
Stddev	.00032	.140	.00021	.01232	.00719	.00714	.01281	.0094
%RSD	8.1423	.53548	28.228	76.277	376.26	70.667	7499.5	.30673

#1	.00429	26.036	.00063	.01259	.00605	-0.01475	.00712	3.0732
#2	.00378	25.995	.00063	.02985	-0.00794	-0.01370	-0.01461	3.0761
#3	.00370	26.255	.00100	.00600	-0.00384	-0.00188	.00801	3.0585

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126701 Acquired: 2/27/2017 21:34:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0001	.29373	-0.00235	-0.00036	.00028	.01825	.00512
Stddev	.00065	.00137	.00091	.00120	.00058	.00018	.06343
%RSD	9565.7	.46639	38.768	330.49	208.21	.96414	1239.9

#1	-0.00064	.29215	-0.00337	-0.00052	.00092	.01808	.07817
#2	-0.00003	.29452	-0.00207	.00090	.00011	.01823	-.02685
#3	.00066	.29452	-0.00162	-0.00147	-0.00020	.01843	-.03597

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5291.5	71577.	8884.1
Stddev	38.1	145.	70.7
%RSD	.72058	.20298	.79635

#1	5247.8	71743.	8952.3
#2	5317.6	71518.	8889.0
#3	5309.3	71471.	8811.0

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126702 Acquired: 2/27/2017 21:38:05 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00180	.26917	-0.00315	.00806	.02369	-0.00002	20.099	.00048
Stddev	.00056	.00429	.00220	.00299	.00101	.00004	.074	.00021
%RSD	30.968	1.5929	69.854	37.065	4.2776	198.36	.36878	43.584

#1	-0.00170	.26845	-0.00545	.00480	.02279	.00003	20.155	.00024
#2	-0.00130	.26529	-0.00292	.01067	.02349	-0.00004	20.015	.00063
#3	-0.00240	.27378	-0.00107	.00873	.02478	-0.00005	20.129	.00056

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00019	.00015	.00055	.11798	.91127	.00134	4.8680	.00183
Stddev	.00006	.00074	.00214	.00904	.02894	.00291	.0361	.00216
%RSD	31.011	481.49	389.06	7.6632	3.1757	217.67	.74071	118.09

#1	-0.00022	-0.00063	-0.00049	.10754	.92893	.00423	4.8702	.00433
#2	-0.00024	.00025	.00302	.12309	.92701	-0.00159	4.9029	.00061
#3	-0.00012	.00084	-0.00087	.12330	.87787	.00136	4.8309	.00055

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00092	2.0107	.00222	-0.00004	-0.00260	-0.00208	-0.00028	3.1650
Stddev	.00066	.0246	.00157	.00604	.00418	.00243	.00355	.0035
%RSD	71.302	1.2252	70.398	14840.	160.70	116.79	1253.4	.11034

#1	-0.00019	1.9908	.00304	.00004	-0.00285	-0.00403	.00178	3.1681
#2	-0.00145	2.0030	.00042	.00596	.00170	-0.00285	.00175	3.1612
#3	-0.00113	2.0382	.00321	-0.00612	-0.00665	.00064	-0.00438	3.1657

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126702 Acquired: 2/27/2017 21:38:05 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00140	.06056	.00137	-.00288	.00033	.00078	.32213
Stddev	.00225	.00029	.00260	.00294	.00043	.00027	.06209
%RSD	160.50	.47281	188.97	102.03	128.58	33.838	19.276

#1	.00210	.06078	.00385	-.00160	-.00016	.00068	.31890
#2	.00323	.06023	-.00133	-.00624	.00060	.00108	.38577
#3	-.00112	.06066	.00160	-.00080	.00056	.00059	.26171

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5320.1	72895.	8843.1
Stddev	7.4	281.	40.5
%RSD	.13958	.38558	.45811

#1	5316.4	72620.	8860.7
#2	5328.6	73182.	8871.9
#3	5315.2	72884.	8796.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126801 Acquired: 2/27/2017 21:41:51 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00198	.76230	-0.00288	.00873	.02830	.00001	17.999	.00030
Stddev	.00126	.00244	.00251	.00058	.00143	.00007	.213	.00004
%RSD	63.381	.32044	87.083	6.6456	5.0615	1286.4	1.1826	11.959

#1	-0.00311	.76379	-0.00084	.00928	.02737	.00008	17.828	.00030
#2	-0.00063	.76363	-0.00212	.00878	.02758	-0.00004	17.931	.00033
#3	-0.00221	.75948	-0.00568	.00812	.02995	-0.00003	18.237	.00026

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00010	.00098	-0.00052	.52017	1.1420	.00371	3.0732	.07909
Stddev	.00089	.00118	.00105	.00672	.0620	.00317	.1564	.00073
%RSD	890.75	120.00	200.80	1.2912	5.4305	85.597	5.0900	.92601

#1	.00072	.00116	.00059	.52518	1.1080	.00684	2.9691	.07955
#2	.00050	.00206	-.00150	.52278	1.1044	.00378	2.9973	.07825
#3	-.00092	-.00027	-.00066	.51254	1.2136	.00050	3.2531	.07948

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00052	2.3603	.00292	.01002	.00014	-.00014	.00105	3.3369
Stddev	.00068	.0250	.00191	.01078	.00707	.00120	.00613	.0123
%RSD	130.66	1.0608	65.623	107.66	5212.2	886.48	583.47	.36711

#1	.00119	2.3393	.00446	.01307	-.00455	.00081	.00116	3.3509
#2	.00054	2.3536	.00077	.01894	.00827	-.00148	.00712	3.3317
#3	-.00017	2.3880	.00352	-.00196	-.00332	.00026	-.00513	3.3280

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126801 Acquired: 2/27/2017 21:41:51 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00006	.06528	.01133	.00174	.00127	.00627	.58172
Stddev	.00090	.00070	.00257	.00246	.00013	.00006	.07425
%RSD	1536.9	1.0793	22.697	141.11	10.042	1.0282	12.764

#1	-.00057	.06450	.01259	.00188	.00113	.00632	.65429
#2	.00098	.06548	.01304	-.00078	.00138	.00629	.58498
#3	-.00059	.06587	.00837	.00413	.00131	.00619	.50590

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5314.8	73432.	8854.7
Stddev	8.5	206.	192.0
%RSD	.16041	.28092	2.1686

#1	5305.0	73349.	8966.2
#2	5320.5	73667.	8964.9
#3	5318.9	73280.	8633.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126802 Acquired: 2/27/2017 21:45:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00095	.10899	-0.00560	.00833	.02019	-0.00005	36.484	.00012
Stddev	.00229	.00327	.00380	.00288	.00083	.00002	.158	.00000
%RSD	240.45	3.0013	67.897	34.611	4.0944	38.962	.43234	1.8148

#1	.00122	.10582	-0.00400	.00983	.01945	-0.00003	36.421	.00012
#2	-0.00073	.10879	-0.00994	.01016	.02005	-0.00007	36.368	.00012
#3	-0.00334	.11236	-0.00286	.00501	.02108	-0.00004	36.664	.00012

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00020	-0.00146	-0.00003	.07175	1.4206	.00679	3.8434	.00515
Stddev	.00019	.00045	.00304	.00269	.0308	.00092	.0640	.00072
%RSD	95.585	30.904	8879.1	3.7491	2.1663	13.519	1.6655	13.996

#1	.00039	-0.00189	-0.00003	.07189	1.3920	.00620	3.7994	.00432
#2	.00001	-0.00150	-0.00307	.06899	1.4531	.00633	3.8140	.00556
#3	.00019	-0.00099	.00300	.07437	1.4167	.00785	3.9169	.00557

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00046	2.0918	.00272	.04127	-0.00121	-0.00389	.00011	3.6002
Stddev	.00049	.0251	.00309	.00533	.00298	.00343	.00589	.0235
%RSD	106.82	1.1995	113.64	12.922	245.83	88.170	5367.8	.65363

#1	.00065	2.0823	.00628	.04709	-0.00180	.00002	.00650	3.6245
#2	-0.00010	2.1203	.00118	.03662	.00202	-0.00526	-0.00510	3.5776
#3	.00083	2.0729	.00070	.04011	-0.00385	-0.00641	-0.00107	3.5985

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126802 Acquired: 2/27/2017 21:45:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00042	.06797	-0.00388	-0.00986	.00072	.00490	.31581
Stddev	.00040	.00021	.00213	.00297	.00050	.00011	.43868
%RSD	94.024	.31212	54.889	30.100	69.297	2.2061	138.91

#1	.00014	.06802	-0.00202	-0.00952	.00101	.00498	-.09858
#2	.00087	.06774	-0.00620	-0.01299	.00100	.00477	.77529
#3	.00025	.06816	-0.00341	-0.00708	.00014	.00494	.27072

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5278.0	72443.	8878.7
Stddev	28.0	96.	19.2
%RSD	.53135	.13311	.21592

#1	5261.5	72554.	8868.1
#2	5310.4	72380.	8867.2
#3	5262.1	72395.	8900.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126901 Acquired: 2/27/2017 21:49:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00150	.03249	-0.00164	.01217	.07869	-0.00002	50.528	.00045
Stddev	.00203	.00485	.00336	.00130	.00012	.00008	.226	.00029
%RSD	135.35	14.930	204.97	10.644	.15801	450.90	.44653	65.042

#1	-0.00036	.02810	.00208	.01071	.07860	-0.00004	50.781	.00052
#2	-0.00030	.03166	-0.00445	.01262	.07883	.00007	50.349	.00070
#3	-0.00385	.03770	-0.00255	.01319	.07863	-0.00008	50.453	.00013

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00010	-0.00020	.00023	.00999	1.1195	.00652	9.8860	.00103
Stddev	.00055	.00038	.00214	.01352	.0313	.00202	.0846	.00114
%RSD	527.12	184.73	932.39	135.28	2.7948	30.963	.85543	111.12

#1	-0.00011	.00020	-0.00199	.00476	1.1046	.00545	9.9799	-0.00027
#2	-0.00031	-0.00028	.00227	-0.00013	1.0986	.00525	9.8158	.00148
#3	.00073	-0.00054	.00041	.02535	1.1555	.00884	9.8623	.00188

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00029	3.1975	.00120	.01146	.00053	-0.00295	-0.00322	2.9168
Stddev	.00025	.0398	.00100	.00705	.00154	.00626	.01081	.0068
%RSD	88.036	1.2464	83.437	61.527	291.83	212.03	335.45	.23459

#1	-0.00006	3.1514	.00104	.00332	-0.00092	-0.00044	.00896	2.9105
#2	-0.00025	3.2204	.00227	.01542	.00036	-0.01008	-0.00696	2.9241
#3	-0.00056	3.2205	.00029	.01563	.00215	.00166	-0.01168	2.9157

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126901 Acquired: 2/27/2017 21:49:24 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00057	.14536	-.01121	-.00605	-.00032	.00160	.03779
Stddev	.00062	.00067	.00552	.00360	.00102	.00031	.16261
%RSD	109.61	.46248	49.289	59.543	313.08	19.403	430.29

#1	.00011	.14611	-.00574	-.00205	.00073	.00186	.08521
#2	.00128	.14515	-.01110	-.00708	-.00040	.00167	-.14325
#3	.00032	.14482	-.01678	-.00904	-.00130	.00126	.17142

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5259.9	72301.	8877.0
Stddev	8.4	181.	31.6
%RSD	.15938	.25019	.35599

#1	5255.7	72406.	8841.5
#2	5254.4	72405.	8902.3
#3	5269.6	72092.	8887.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126902 Acquired: 2/27/2017 21:53:10 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00380	.05704	-0.00491	.00990	.06396	-0.00001	46.522	.00053
Stddev	.00063	.01010	.00358	.00201	.00077	.00002	.052	.00062
%RSD	16.520	17.715	73.027	20.280	1.2031	158.01	.11178	116.91

#1	-0.00320	.04641	-0.00766	.00802	.06475	-0.00002	46.575	.00121
#2	-0.00445	.05819	-0.00086	.00967	.06392	.00001	46.520	-0.00000
#3	-0.00374	.06652	-0.00621	.01202	.06321	-0.00003	46.471	.00039

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00039	-0.00054	-0.00093	.02427	2.0757	.00521	6.9856	.00194
Stddev	.00039	.00027	.00088	.01308	.0242	.00114	.0348	.00168
%RSD	98.763	50.200	94.342	53.913	1.1649	21.829	.49741	86.952

#1	-0.00004	-0.00051	-0.00064	.03027	2.0957	.00610	7.0253	.00138
#2	.00053	-0.00083	-0.00023	.00926	2.0488	.00393	6.9606	.00382
#3	.00070	-0.00029	-0.00191	.03328	2.0825	.00562	6.9710	.00060

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00024	3.5692	.00052	.01668	-0.00149	.00652	.00712	3.3325
Stddev	.00063	.0218	.00129	.01002	.00185	.00807	.00420	.0169
%RSD	259.42	.60963	250.77	60.079	124.16	123.82	58.972	.50556

#1	.00019	3.5730	-0.00097	.02276	-0.00249	.00507	.00869	3.3519
#2	-0.00036	3.5888	.00109	.00511	-0.00262	.01521	.00236	3.3224
#3	.00089	3.5458	.00142	.02216	.00064	-0.00073	.01030	3.3231

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126902 Acquired: 2/27/2017 21:53:10 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00000	.13479	-0.00587	-0.00624	.00034	.00060	.17492
Stddev	.00038	.00089	.00283	.00637	.00129	.00003	.07262
%RSD	8201.5	.65920	48.173	101.97	374.85	4.5048	41.512

#1	-.00043	.13525	-.00453	-.01242	-.00075	.00063	.11085
#2	.00015	.13536	-.00912	.00030	.00002	.00058	.16012
#3	.00029	.13377	-.00396	-.00662	.00176	.00060	.25380

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5060.5	70878.	8585.5
Stddev	18.9	922.	167.5
%RSD	.37428	1.3007	1.9511

#1	5082.4	70241.	8768.6
#2	5050.5	70458.	8547.8
#3	5048.7	71935.	8440.0

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126903 Acquired: 2/27/2017 21:56:57 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00167	2.2396	-0.00530	.01083	.07134	-0.00001	49.816	.00048
Stddev	.00078	.0093	.00221	.00129	.00031	.00004	.113	.00020
%RSD	46.836	.41404	41.761	11.922	.43700	578.76	.22670	40.860

#1	-0.00144	2.2292	-0.00297	.00962	.07167	-0.00003	49.738	.00061
#2	-0.00102	2.2426	-0.00738	.01069	.07129	.00004	49.764	.00026
#3	-0.00253	2.2470	-0.00555	.01219	.07105	-0.00003	49.945	.00058

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00079	.00135	.00070	2.0579	1.9099	.00328	8.1700	.14462
Stddev	.00033	.00080	.00209	.0170	.0563	.00544	.0584	.00270
%RSD	42.597	58.923	299.42	.82744	2.9462	166.03	.71518	1.8696

#1	.00040	.00220	-0.00169	2.0492	1.9537	.00811	8.1026	.14274
#2	.00093	.00122	.00221	2.0775	1.8464	.00435	8.2074	.14772
#3	.00103	.00063	.00157	2.0470	1.9295	-0.00262	8.1998	.14340

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00011	4.0439	.00425	.02751	-0.00018	.00015	-0.00314	5.8704
Stddev	.00107	.0018	.00120	.00523	.00334	.00344	.00772	.0176
%RSD	1012.5	.04413	28.224	19.012	1905.1	2362.4	246.38	.30009

#1	-0.00040	4.0459	.00559	.03355	-0.00162	.00386	-0.00612	5.8503
#2	-0.00061	4.0433	.00326	.02457	-0.00255	-0.00049	-0.00892	5.8835
#3	.00133	4.0425	.00391	.02442	.00364	-0.00293	.00564	5.8773

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126903 Acquired: 2/27/2017 21:56:57 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00062	.14058	.03832	-.00312	.00345	.00493	1.1028
Stddev	.00143	.00033	.00671	.00365	.00041	.00010	.3040
%RSD	229.23	.23339	17.502	117.09	11.918	1.9435	27.564

#1	.00219	.14020	.03985	-.00715	.00366	.00502	.85098
#2	-.00061	.14072	.04412	-.00221	.00297	.00483	1.0169
#3	.00029	.14081	.03098	-.00001	.00371	.00493	1.4404

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5256.4	71897.	8702.5
Stddev	58.7	155.	13.8
%RSD	1.1170	.21581	.15865

#1	5189.3	71746.	8708.2
#2	5298.7	71889.	8712.5
#3	5281.0	72056.	8686.7

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 22:00:43 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41118	10.502	.41488	.51206	1.0465	.05144	10.473	.05144
Stddev	.00617	.028	.00124	.00162	.0022	.00015	.040	.00055
%RSD	1.4995	.26467	.29935	.31651	.20885	.28845	.38344	1.0665

#1	.40980	10.474	.41583	.51321	1.0440	.05141	10.450	.05154
#2	.40583	10.530	.41533	.51021	1.0481	.05160	10.520	.05194
#3	.41792	10.501	.41348	.51277	1.0473	.05130	10.450	.05085

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20712	.51889	.52192	3.9495	54.184	1.0895	10.079	.49379
Stddev	.00050	.00157	.00296	.0132	.094	.0033	.114	.00435
%RSD	.24210	.30242	.56664	.33519	.17314	.30559	1.1279	.88142

#1	.20755	.51708	.52362	3.9342	54.149	1.0860	10.209	.49224
#2	.20657	.51983	.51850	3.9572	54.113	1.0927	10.032	.49871
#3	.20724	.51976	.52363	3.9570	54.291	1.0897	9.9965	.49042

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0294	53.728	.52204	10.315	.52769	1.2397	.40496	5.1554
Stddev	.0012	.100	.00107	.022	.00678	.0038	.01668	.0059
%RSD	.11310	.18550	.20534	.20975	1.2855	.30798	4.1185	.11517

#1	1.0286	53.754	.52237	10.335	.53178	1.2419	.40441	5.1616
#2	1.0290	53.618	.52290	10.292	.51986	1.2420	.42190	5.1497
#3	1.0308	53.812	.52084	10.317	.53144	1.2353	.38856	5.1548

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Approved: February 28, 2017

K. K. Beck

Sample Name: CCV Acquired: 2/27/2017 22:00:43 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0401	1.0406	1.0186	.53014	1.0336	1.0457	.90575
Stddev	.0009	.0024	.0116	.00202	.0039	.0013	.29187
%RSD	.08974	.23138	1.1430	.38026	.37887	.12150	32.224

#1	1.0410	1.0382	1.0166	.53227	1.0361	1.0472	.70828
#2	1.0391	1.0406	1.0081	.52988	1.0357	1.0453	1.2410
#3	1.0401	1.0430	1.0311	.52827	1.0291	1.0448	.76797

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 Value
 Range

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5179.2	70976.	8810.6
Stddev	5.6	395.	23.4
%RSD	.10737	.55661	.26571

#1	5176.1	71396.	8819.5
#2	5176.0	70920.	8784.1
#3	5185.7	70611.	8828.3

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 22:04:17 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00205	.00524	-0.00250	-0.00050	.00099	-0.00007	-0.01071
Stddev	.00060	.00464	.00180	.00080	.00103	.00004	.00776
%RSD	29.039	88.527	72.086	160.66	103.73	52.522	72.434

#1	-0.00137	.00689	-0.00294	.00033	.00199	-0.00011	-0.01775
#2	-0.00246	.00000	-0.00404	-0.00057	-0.00007	-0.00005	-0.01197
#3	-0.00233	.00883	-0.00052	-0.00127	.00106	-0.00005	-0.00240

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00014	.00040	-0.00044	-0.00037	-0.01026	.13606	.00138
Stddev	.00029	.00059	.00093	.00046	.02203	.05841	.00222
%RSD	200.77	147.64	209.73	123.94	214.62	42.930	160.16

#1	.00045	.00107	.00051	-0.00089	.01338	.09244	.00298
#2	.00010	.00017	-0.00050	-0.00023	-0.01396	.11332	-0.00115
#3	-0.00012	-0.00004	-0.00134	-0.00000	-0.03021	.20242	.00232

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.04143	-0.00069	.00041	.03796	-0.00020	-0.00522	-0.00270
Stddev	.07330	.00119	.00053	.01323	.00288	.00323	.00485
%RSD	176.91	173.25	129.08	34.862	1431.5	61.810	179.77

#1	.06653	-0.00137	.00015	.04444	-0.00046	-0.00181	-0.00823
#2	.09888	.00069	.00102	.02273	.00280	-0.00562	-0.00068
#3	-0.04112	-0.00138	.00006	.04670	-0.00294	-0.00823	.00081

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 22:04:17 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00634	-0.00069	-0.00021	.00010	.00034	-0.00446	.00295
Stddev	.00191	.00452	.00197	.00117	.00038	.00587	.00463
%RSD	30.115	651.22	919.16	1122.7	111.65	131.72	156.87

#1	-0.00420	-0.00218	.00110	-0.00089	.00077	-.01118	.00239
#2	-0.00786	.00438	-.00248	-0.00019	.00008	-.00184	.00784
#3	-0.00695	-.00428	.00074	.00140	.00016	-.00035	-.00137

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00021	-0.00069	F .10838
Stddev	.00011	.00012	.42404
%RSD	51.826	17.447	391.26

#1	-0.00010	-0.00082	.24555
#2	-0.00021	-0.00065	-.36727
#3	-0.00032	-0.00059	.44685

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5257.4	72186.	8639.2
Stddev	9.4	438.	21.8
%RSD	.17840	.60666	.25223

#1	5264.7	71686.	8621.6
#2	5260.8	72365.	8632.6
#3	5246.9	72505.	8663.6

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126904 Acquired: 2/27/2017 22:08:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00151	.10283	-0.00245	.01347	.05816	-0.00011	56.832	.00035
Stddev	.00171	.00616	.00336	.00034	.00009	.00003	.255	.00010
%RSD	113.42	5.9892	137.42	2.5356	.16262	25.146	.44895	27.716

#1	-0.00310	.09598	-0.00286	.01382	.05809	-0.00012	56.989	.00046
#2	.00030	.10462	.00110	.01344	.05812	-0.00012	56.970	.00027
#3	-0.00172	.10790	-0.00558	.01314	.05827	-0.00008	56.538	.00033

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00022	.00026	-0.00210	.04754	1.4517	.00829	6.1374	.00216
Stddev	.00092	.00178	.00124	.00113	.0450	.00186	.0450	.00292
%RSD	418.56	687.43	59.090	2.3758	3.0978	22.438	.73338	134.84

#1	.00119	-0.00155	-0.00342	.04806	1.4235	.00628	6.1004	.00087
#2	.00012	.00032	-0.00193	.04831	1.4280	.00995	6.1875	.00011
#3	-0.00065	.00201	-0.00095	.04624	1.5035	.00863	6.1243	.00550

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00023	6.0425	.00034	.00670	-0.00176	-0.00879	-0.00328	3.2871
Stddev	.00058	.0046	.00163	.00868	.00088	.00586	.01056	.0113
%RSD	250.19	.07648	479.21	129.58	49.991	66.642	321.66	.34439

#1	-0.00043	6.0422	.00129	-0.00327	-0.00077	-0.00843	.00592	3.2931
#2	.00067	6.0473	.00127	.01082	-0.00245	-0.00312	-.01481	3.2942
#3	.00046	6.0381	-0.00154	.01255	-0.00205	-0.01482	-0.00095	3.2741

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126904 Acquired: 2/27/2017 22:08:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00007	.17169	-.00344	-.00529	-.00042	.00090	.17783
Stddev	.00089	.00066	.00700	.00461	.00059	.00020	.12524
%RSD	1333.4	.38309	203.41	87.138	139.19	22.327	70.424

#1	-.00070	.17183	-.00734	-.00951	-.00102	.00068	.03362
#2	.00105	.17227	.00464	-.00037	.00016	.00106	.25925
#3	-.00015	.17098	-.00763	-.00598	-.00041	.00096	.24062

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5222.9	72202.	8842.1
Stddev	18.7	170.	76.3
%RSD	.35839	.23566	.86263

#1	5207.4	72127.	8832.7
#2	5243.7	72083.	8770.9
#3	5217.5	72397.	8922.6

Approved: February 28, 2017

Ki K Beck

Sample Name: L1702126904MS Acquired: 2/27/2017 22:11:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19434	5.0544	.19132	.92685	.55845	.02433	60.594	.02452
Stddev	.00037	.0173	.00542	.00649	.00131	.00006	.057	.00047
%RSD	.19016	.34180	2.8304	.69994	.23372	.26077	.09350	1.9354

#1	.19406	5.0735	.19079	.92484	.55984	.02426	60.658	.02507
#2	.19420	5.0400	.19698	.93411	.55724	.02436	60.549	.02430
#3	.19476	5.0496	.18618	.92161	.55828	.02438	60.575	.02420

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09798	.24521	.24480	1.9479	27.624	.52696	10.769	.23698
Stddev	.00074	.00182	.00099	.0138	.049	.00137	.180	.00440
%RSD	.75349	.74328	.40244	.70651	.17889	.25968	1.6749	1.8577

#1	.09883	.24715	.24383	1.9331	27.670	.52854	10.655	.23199
#2	.09763	.24495	.24580	1.9603	27.630	.52623	10.676	.23866
#3	.09748	.24353	.24477	1.9504	27.572	.52611	10.977	.24030

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49359	31.948	.24579	4.8489	.24759	.57977	.17605	5.7045
Stddev	.00157	.030	.00067	.0310	.00192	.00222	.00889	.0076
%RSD	.31734	.09440	.27227	.63862	.77651	.38326	5.0512	.13321

#1	.49538	31.924	.24502	4.8586	.24615	.58205	.18295	5.7118
#2	.49293	31.982	.24616	4.8738	.24685	.57963	.16602	5.7051
#3	.49246	31.938	.24620	4.8142	.24977	.57761	.17918	5.6967

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126904MS Acquired: 2/27/2017 22:11:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-04

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49355	.66693	.48492	.24469	.49372	.48631	.52763
Stddev	.00248	.00091	.00531	.00595	.00047	.00150	.07348
%RSD	.50153	.13627	1.0956	2.4296	.09475	.30915	13.926
#1	.49578	.66673	.48027	.23915	.49322	.48775	.56440
#2	.49399	.66792	.49071	.24394	.49379	.48643	.57546
#3	.49089	.66613	.48377	.25097	.49415	.48475	.44303

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5192.3	70790.	8644.4
Stddev	14.0	404.	108.3
%RSD	.26938	.57117	1.2525
#1	5176.1	70327.	8726.2
#2	5200.2	71078.	8685.3
#3	5200.5	70964.	8521.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126904MSD Acquired: 2/27/2017 22:15:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19357	5.0899	.19584	.92960	.55799	.02444	60.078	.02449
Stddev	.00089	.0118	.00212	.00421	.00099	.00002	.095	.00057
%RSD	.46178	.23183	1.0803	.45241	.17815	.07072	.15824	2.3347

#1	.19443	5.0766	.19826	.93158	.55783	.02443	60.070	.02404
#2	.19364	5.0940	.19438	.92477	.55709	.02444	59.987	.02513
#3	.19265	5.0990	.19487	.93245	.55906	.02446	60.177	.02430

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09834	.24605	.24604	1.9602	27.472	.52374	10.565	.23393
Stddev	.00038	.00139	.00151	.0219	.071	.00562	.085	.00131
%RSD	.38165	.56333	.61175	1.1159	.25926	1.0732	.80914	.56172

#1	.09850	.24446	.24744	1.9823	27.441	.52824	10.467	.23309
#2	.09791	.24701	.24445	1.9600	27.423	.51744	10.625	.23327
#3	.09860	.24668	.24624	1.9385	27.554	.52555	10.603	.23545

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49560	31.813	.24610	4.8775	.24737	.58087	.18249	5.7005
Stddev	.00165	.022	.00218	.0163	.00300	.00493	.00907	.0188
%RSD	.33379	.06923	.88731	.33470	1.2114	.84844	4.9716	.33067

#1	.49557	31.790	.24394	4.8934	.25019	.58246	.18982	5.7223
#2	.49397	31.834	.24831	4.8607	.24422	.58480	.18529	5.6896
#3	.49727	31.814	.24606	4.8785	.24769	.57534	.17234	5.6897

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126904MSD Acquired: 2/27/2017 22:15:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604241-05

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49653	.66486	.49011	.25317	.49536	.48879	.29388
Stddev	.00092	.00103	.00083	.00685	.00074	.00148	.03547
%RSD	.18628	.15524	.16947	2.7071	.15004	.30358	12.071
#1	.49702	.66487	.49107	.24597	.49612	.49051	.33473
#2	.49711	.66382	.48963	.25962	.49463	.48800	.27081
#3	.49546	.66589	.48964	.25393	.49534	.48788	.27610

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5168.4	70694.	8753.7
Stddev	11.0	160.	22.6
%RSD	.21377	.22598	.25807
#1	5155.9	70878.	8740.7
#2	5172.2	70593.	8740.7
#3	5177.0	70610.	8779.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127001 Acquired: 2/27/2017 22:19:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00273	.63365	-0.00381	.01151	.02900	-0.00001	33.730	.00020
Stddev	.00087	.00744	.00314	.00164	.00048	.00006	.045	.00022
%RSD	32.018	1.1738	82.320	14.229	1.6701	1281.6	.13324	105.66

#1	-0.00191	.64068	-0.00189	.01225	.02845	-0.00002	33.707	-0.00003
#2	-0.00264	.63441	-0.00211	.01264	.02919	-0.00006	33.700	.00039
#3	-0.00365	.62586	-0.00743	.00963	.02936	.00007	33.781	.00025

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00027	.00109	.00041	.39336	1.0090	.00574	5.3388	.00488
Stddev	.00008	.00051	.00167	.00594	.0515	.00388	.0607	.00141
%RSD	30.717	47.245	408.24	1.5108	5.1004	67.662	1.1364	28.895

#1	-0.00035	.00050	.00231	.40022	.95013	.00135	5.2999	.00543
#2	-0.00026	.00132	-0.00082	.38985	1.0312	.00712	5.3078	.00328
#3	-0.00019	.00144	-0.00026	.39002	1.0456	.00874	5.4087	.00594

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00055	4.1660	.00081	.01975	-0.00113	-0.00918	-0.00431	4.2939
Stddev	.00056	.0226	.00134	.00436	.00409	.00424	.00392	.0397
%RSD	101.24	.54133	165.56	22.070	362.25	46.150	91.127	.92367

#1	.00057	4.1437	.00069	.01514	-0.00381	-0.00948	-0.00556	4.3241
#2	-0.00002	4.1655	.00220	.02381	.00358	-0.00481	-0.00745	4.3086
#3	.00110	4.1888	-0.00046	.02030	-0.00316	-0.01327	.00009	4.2490

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127001 Acquired: 2/27/2017 22:19:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0064	.08049	.01099	-0.00891	.00042	.00511	.40529
Stddev	.00032	.00051	.00454	.00305	.00080	.00016	.07868
%RSD	50.311	.63829	41.337	34.224	188.63	3.0418	19.414

#1	-0.0044	.08047	.01304	-0.00900	-0.00050	.00496	.39248
#2	-0.00101	.07999	.00578	-0.00582	.00095	.00527	.33379
#3	-0.00046	.08102	.01415	-0.01192	.00082	.00510	.48959

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5305.7	72987.	8818.3
Stddev	35.2	360.	31.9
%RSD	.66370	.49280	.36167

#1	5272.6	72635.	8812.8
#2	5301.8	73354.	8852.6
#3	5342.7	72973.	8789.5

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127002 Acquired: 2/27/2017 22:23:03 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00026	.21337	.00005	.01098	.02546	-.00004	27.474
Stddev	.00107	.00483	.00452	.00212	.00037	.00007	.065
%RSD	416.15	2.2624	9064.5	19.315	1.4598	171.88	.23539

#1	.00088	.21159	-.00450	.00986	.02566	-.00012	27.409
#2	-.00123	.21884	.00011	.00965	.02568	-.00003	27.538
#3	-.00042	.20969	.00454	.01342	.02503	.00002	27.476

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00001	.00009	.00005	.00017	.19268	1.6020	-.00157
Stddev	.00010	.00042	.00119	.00047	.01227	.0228	.00185
%RSD	739.45	476.26	2463.4	275.55	6.3673	1.4204	118.21

#1	.00010	.00017	.00136	.00015	.17970	1.5769	-.00007
#2	-.00011	-.00037	-.00095	.00066	.20409	1.6212	-.00364
#3	-.00003	.00046	-.00026	-.00029	.19425	1.6081	-.00099

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.0068	.02459	.00002	2.9462	.00131	.03001	-.00172
Stddev	.0822	.00053	.00048	.0181	.00049	.00543	.00716
%RSD	2.0511	2.1510	3018.3	.61573	37.275	18.092	416.18

#1	3.9257	.02515	.00024	2.9258	.00075	.02919	.00620
#2	4.0045	.02453	.00034	2.9605	.00160	.02504	-.00361
#3	4.0901	.02410	-.00053	2.9524	.00158	.03580	-.00775

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127002 Acquired: 2/27/2017 22:23:03 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00601	F -0.01368	1.0428	.00068	.07275	-0.00190	-0.00364
Stddev	.00180	.00943	.0146	.00110	.00037	.00657	.00572
%RSD	30.000	68.912	1.4029	161.56	.51107	345.56	157.06

#1	-0.00698	-0.01307	1.0576	.00194	.07234	-0.00039	-0.00510
#2	-0.00711	-0.02340	1.0426	-0.00002	.07286	-0.00910	-0.00850
#3	-0.00393	-0.00458	1.0283	.00012	.07306	.00379	.00267

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		90.000					
Low Limit		-0.01000					

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00010	.00137	.18442
Stddev	.00028	.00020	.12748
%RSD	268.61	14.603	69.123

#1	-0.00018	.00138	.33050
#2	-0.00034	.00157	.12704
#3	.00021	.00117	.09571

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5340.8	73784.	8849.1
Stddev	4.0	133.	14.0
%RSD	.07581	.18033	.15826

#1	5340.1	73891.	8849.2
#2	5345.2	73825.	8835.1
#3	5337.2	73635.	8863.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127301 Acquired: 2/27/2017 22:26:50 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00215	2.6343	.01070	.03117	.30089	.00017	65.065	.00101
Stddev	.00058	.0132	.00589	.00358	.00112	.00007	.309	.00036
%RSD	26.831	.50180	55.022	11.480	.37377	37.553	.47546	36.105

#1	-0.00236	2.6219	.00441	.02988	.30067	.00012	64.933	.00127
#2	-0.00149	2.6482	.01609	.03521	.30211	.00025	65.418	.00116
#3	-0.00258	2.6327	.01162	.02841	.29990	.00016	64.843	.00059

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01028	.00491	.03638	6.1859	2.5389	.00908	8.3082	1.9997
Stddev	.00026	.00048	.00110	.0099	.0216	.00070	.0094	.0016
%RSD	2.5558	9.8762	3.0296	.15982	.85079	7.7177	.11323	.08088

#1	.01056	.00544	.03522	6.1819	2.5282	.00827	8.3059	2.0004
#2	.01004	.00449	.03651	6.1787	2.5638	.00944	8.3001	2.0009
#3	.01025	.00480	.03741	6.1972	2.5247	.00953	8.3185	1.9979

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00088	8.3923	.02379	.15936	.01061	-.01040	-.00974	7.7637
Stddev	.00047	.0303	.00122	.00579	.00252	.00381	.00649	.0466
%RSD	52.961	.36161	5.1346	3.6360	23.771	36.643	66.598	.60073

#1	.00117	8.3864	.02238	.15968	.00922	-.00615	-.00294	7.7413
#2	.00034	8.4252	.02455	.16499	.00908	-.01154	-.01042	7.7325
#3	.00112	8.3653	.02443	.15342	.01351	-.01351	-.01587	7.8173

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702127301 Acquired: 2/27/2017 22:26:50 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00020	.47974	.03256	-.00527	.00551	.03670	.92910
Stddev	.00189	.00214	.00240	.00511	.00145	.00027	.15221
%RSD	939.45	.44646	7.3637	97.059	26.256	.73143	16.382

#1	-.00198	.47958	.03209	-.00679	.00576	.03693	.84182
#2	.00133	.48196	.03516	-.00944	.00681	.03676	.84063
#3	.00124	.47769	.03044	.00043	.00395	.03640	1.1049

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5266.4	72380.	8589.2
Stddev	14.7	317.	87.4
%RSD	.27822	.43765	1.0173

#1	5283.3	72715.	8686.3
#2	5257.8	72086.	8516.8
#3	5258.1	72339.	8564.7

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 22:30:36 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41105	10.648	.41430	.51308	1.0565	.05182	10.527
Stddev	.00082	.041	.00360	.00031	.0015	.00009	.052
%RSD	.19920	.38240	.86817	.05996	.13925	.18088	.49315

#1	.41080	10.694	.41095	.51276	1.0551	.05189	10.504
#2	.41197	10.622	.41810	.51311	1.0580	.05171	10.586
#3	.41039	10.626	.41385	.51337	1.0565	.05185	10.490

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05142	.20801	.52221	.52499	3.9942	54.936	1.0858
Stddev	.00019	.00114	.00105	.00127	.0107	.167	.0026
%RSD	.37172	.54691	.20098	.24133	.26706	.30331	.23885

#1	.05132	.20685	.52333	.52426	3.9912	54.744	1.0872
#2	.05130	.20912	.52204	.52426	3.9854	55.017	1.0874
#3	.05164	.20808	.52125	.52645	4.0061	55.046	1.0828

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.168	.49290	1.0313	54.321	.52203	10.394	.53077
Stddev	.067	.00234	.0018	.176	.00135	.008	.00854
%RSD	.66340	.47490	.17751	.32382	.25843	.07590	1.6088

#1	10.091	.49167	1.0292	54.130	.52244	10.387	.52354
#2	10.196	.49143	1.0318	54.477	.52312	10.392	.54019
#3	10.217	.49560	1.0327	54.356	.52052	10.402	.52858

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 22:30:36 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2451	.41015	5.1814	1.0476	1.0510	1.0319	.53262
Stddev	.0027	.00303	.0120	.0036	.0011	.0074	.00320
%RSD	.22047	.73766	.23197	.34408	.10892	.72014	.60141

#1	1.2449	.41364	5.1702	1.0438	1.0500	1.0246	.53009
#2	1.2425	.40852	5.1941	1.0478	1.0523	1.0394	.53154
#3	1.2479	.40828	5.1800	1.0510	1.0508	1.0316	.53622

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0407	1.0528	F .81842
Stddev	.0033	.0022	.33251
%RSD	.31444	.21350	40.628

#1	1.0422	1.0502	1.1823
#2	1.0369	1.0540	.74258
#3	1.0429	1.0543	.53039

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5172.7	70657.	8710.7
Stddev	24.3	117.	49.0
%RSD	.47059	.16627	.56218

#1	5198.7	70552.	8724.0
#2	5150.4	70784.	8656.5
#3	5169.1	70635.	8751.7

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 22:34:11 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0116	.00290	-0.00430	.00169	.00009	-0.00002	-0.00571
Stddev	.00126	.00235	.00288	.00265	.00030	.00005	.01470
%RSD	109.15	81.066	66.813	156.98	328.87	197.73	257.54

#1	-0.00154	.00319	-0.00121	-0.00046	.00019	-0.00004	-.01915
#2	-0.00218	.00042	-0.00480	.00088	-0.00024	.00003	.01000
#3	.00025	.00509	-0.00690	.00466	.00032	-0.00006	-.00798

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00002	-0.00011	-0.00049	-0.00141	-0.00743	.11707	.00351
Stddev	.00009	.00067	.00064	.00170	.02332	.05932	.00364
%RSD	373.02	586.49	130.55	120.46	313.84	50.669	103.72

#1	.00003	-0.00045	-0.00120	-0.00041	.00101	.17948	.00749
#2	.00011	-0.00055	.00004	-0.00045	-0.03380	.06142	.00034
#3	-0.00007	.00066	-0.00031	-0.00337	.01049	.11031	.00270

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.03702	.00036	-0.00017	.04382	.00178	-0.00528	-0.00086
Stddev	.01121	.00099	.00024	.00904	.00063	.00882	.00244
%RSD	30.283	278.99	146.40	20.625	35.403	167.16	283.15

#1	-0.03390	.00055	-0.00015	.03696	.00138	-0.01516	-.00202
#2	-0.04945	-0.00072	.00007	.04043	.00251	-0.00251	-.00250
#3	-0.02769	.00124	-0.00042	.05406	.00146	.00183	.00194

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 22:34:11 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00705	-0.00217	-0.00046	.00043	.00027	-0.00070	-0.00606
Stddev	.00357	.00380	.00272	.00082	.00007	.00589	.00443
%RSD	50.627	174.91	594.83	189.70	25.584	845.95	73.113

#1	-0.00461	-0.00598	-0.00122	-0.00002	.00033	-0.00452	-0.00274
#2	-0.00540	-0.00216	.00256	-0.00006	.00027	.00609	-0.01109
#3	-0.01115	.00162	-0.00272	.00138	.00020	-0.00365	-0.00434

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00054	-0.00076	F .33233
Stddev	.00068	.00015	.03824
%RSD	125.83	19.860	11.505

#1	.00111	-0.00083	.34729
#2	-0.00021	-0.00087	.28887
#3	.00073	-0.00059	.36082

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5276.8	73173.	8772.0
Stddev	29.1	179.	75.7
%RSD	.55241	.24446	.86344

#1	5305.9	73084.	8762.8
#2	5247.6	73056.	8852.0
#3	5277.0	73379.	8701.4

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW AF Acquired: 2/27/2017 22:38:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00028	-0.00085	-0.00372	-0.00053	-0.00017	-0.00006	-0.02048	.00022
Stddev	.00090	.00562	.00397	.00148	.00020	.00006	.01452	.00014
%RSD	323.55	656.86	106.62	278.73	118.90	99.205	70.909	63.429

#1	-0.00132	-0.00716	-0.00346	-0.00008	-0.00006	-0.00007	-0.00855	.00023
#2	.00032	.00097	.00011	.00067	-0.00041	.00000	-0.01624	.00008
#3	.00016	.00362	-0.00781	-0.00219	-0.00005	-0.00011	-0.03664	.00036

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00007	-0.00053	.00002	.00306	.01844	-0.00319	.01111	-0.00028
Stddev	.00049	.00090	.00236	.01091	.01530	.00314	.04730	.00189
%RSD	737.39	172.15	11395.	356.37	82.963	98.406	425.93	679.71

#1	.00043	.00035	-0.00050	-0.00413	.03036	-0.00378	.02644	-0.00041
#2	-0.00050	-0.00145	.00260	-0.00230	.02377	-0.00600	-0.04196	.00167
#3	.00027	-0.00048	-0.00204	.01562	.00119	.00020	.04884	-0.00209

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	.05186	.00177	-0.01707	-0.00252	-0.00749	-0.00897	.00287
Stddev	.00053	.01622	.00033	.00612	.00395	.00260	.00713	.00326
%RSD	604.73	31.276	18.790	35.856	156.35	34.651	79.527	113.37

#1	.00030	.03392	.00199	-0.01280	-0.00460	-0.00896	-0.01203	-0.00030
#2	.00048	.05619	.00193	-0.02409	.00203	-0.00449	-0.00082	.00272
#3	-0.00051	.06548	.00139	-0.01434	-0.00499	-0.00902	-0.01406	.00621

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: PBW AF Acquired: 2/27/2017 22:38:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00023	.00007	-0.00331	-0.00959	.00019	.00012	.20256
Stddev	.00107	.00023	.00398	.00540	.00024	.00037	.18597
%RSD	471.86	338.21	120.22	56.349	123.47	301.57	91.810

#1	.00141	.00018	-0.00609	-0.00793	.00043	.00008	.37543
#2	-0.00067	.00021	.00125	-0.01563	.00021	-0.00022	.00580
#3	-0.00006	-0.00019	-0.00508	-0.00521	-0.00005	.00051	.22643

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5316.4	74006.	8796.8
Stddev	.5	88.	22.5
%RSD	.01012	.11873	.25577

#1	5317.0	74042.	8787.3
#2	5315.9	73906.	8822.5
#3	5316.4	74070.	8780.7

Approved: February 28, 2017

Ki K Beck

Sample Name: LCSW AF Acquired: 2/27/2017 22:41:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19730	5.2874	.19638	.92761	.51445	.02450	5.0846	.02494
Stddev	.00111	.0116	.00669	.00528	.00082	.00003	.0217	.00020
%RSD	.56290	.21868	3.4070	.56893	.15862	.11475	.42602	.79719

#1	.19846	5.2953	.19263	.92153	.51463	.02449	5.0857	.02478
#2	.19624	5.2742	.20410	.93024	.51357	.02449	5.0624	.02516
#3	.19720	5.2929	.19240	.93105	.51517	.02454	5.1057	.02487

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10179	.25167	.25414	1.9310	26.604	.52936	4.8875	.23981
Stddev	.00028	.00073	.00122	.0091	.110	.00261	.0923	.00067
%RSD	.27452	.29159	.48146	.46945	.41330	.49382	1.8883	.28008

#1	.10161	.25112	.25545	1.9410	26.522	.52682	4.8573	.24057
#2	.10211	.25140	.25392	1.9288	26.729	.52920	4.8141	.23930
#3	.10164	.25251	.25304	1.9232	26.560	.53204	4.9911	.23955

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50507	26.592	.25615	4.8860	.25849	.59174	.18923	2.5128
Stddev	.00078	.031	.00405	.0113	.00525	.00296	.00533	.0023
%RSD	.15493	.11771	1.5795	.23043	2.0306	.50021	2.8175	.09132

#1	.50525	26.561	.25331	4.8779	.25293	.58847	.18318	2.5148
#2	.50574	26.623	.25435	4.8812	.26335	.59424	.19324	2.5132
#3	.50421	26.593	.26078	4.8988	.25919	.59251	.19128	2.5103

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: LCSW AF Acquired: 2/27/2017 22:41:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-03

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51004	.51118	.49902	.25544	.50281	.50766	.48331
Stddev	.00033	.00052	.00239	.00336	.00072	.00021	.17976
%RSD	.06540	.10094	.47870	1.3136	.14240	.04068	37.193
#1	.51043	.51150	.50175	.25328	.50234	.50783	.65200
#2	.50987	.51146	.49728	.25373	.50364	.50743	.29422
#3	.50983	.51058	.49804	.25930	.50246	.50771	.50371

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5240.0	72221.	8819.0
Stddev	5.5	71.	84.2
%RSD	.10461	.09823	.95489
#1	5239.6	72146.	8806.5
#2	5234.7	72287.	8741.8
#3	5245.6	72230.	8908.8

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126201 Acquired: 2/27/2017 22:45:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00128	.02002	-0.00088	.03154	.69776	.00010	F 545.34
Stddev	.00346	.00545	.00695	.00520	.00185	.00005	1.83
%RSD	270.25	27.250	786.86	16.488	.26538	52.002	.33594

#1	.00172	.01842	.00009	.03743	.69569	.00012	543.87
#2	-.00507	.02609	.00553	.02961	.69925	.00004	547.39
#3	-.00050	.01554	-.00827	.02758	.69834	.00014	544.75

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00141	.00627	.04700	.00508	8.9907	10.195	.05273
Stddev	.00006	.00019	.00109	.00217	.0159	.049	.00239
%RSD	4.0161	2.9606	2.3100	42.720	.17721	.48235	4.5272

#1	.00142	.00642	.04622	.00481	8.9796	10.248	.05062
#2	.00135	.00606	.04824	.00306	8.9835	10.151	.05532
#3	.00146	.00634	.04655	.00737	9.0090	10.188	.05225

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	70.422	5.6732	.00172	119.42	.03226	-.00323	-.00157
Stddev	.147	.0107	.00051	.13	.00167	.00869	.00168
%RSD	.20843	.18915	29.854	.10552	5.1756	269.10	106.90

#1	70.349	5.6614	.00151	119.42	.03351	-.01005	-.00033
#2	70.591	5.6761	.00135	119.30	.03290	.00655	-.00090
#3	70.326	5.6822	.00231	119.55	.03036	-.00619	-.00349

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126201 Acquired: 2/27/2017 22:45:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00328	F -0.01781	3.0102	.00173	7.0883	F -0.05569	.00401
Stddev	.00500	.00745	.0056	.00152	.0174	.00109	.00232
%RSD	152.72	41.843	.18738	87.860	.24593	1.9600	57.826

#1	-.00878	-.02476	3.0038	-.00002	7.0702	-.05482	.00664
#2	.00099	-.01872	3.0124	.00272	7.1049	-.05692	.00227
#3	-.00204	-.00994	3.0144	.00248	7.0898	-.05535	.00312

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit		90.000				36.000	
Low Limit		-.01000				-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00141	.00244	F -.45002
Stddev	.00119	.00007	.10778
%RSD	83.961	2.9642	23.951

#1	.00240	.00245	-.42151
#2	.00010	.00236	-.35935
#3	.00174	.00250	-.56918

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4828.9	66014.	8593.7
Stddev	8.0	163.	19.5
%RSD	.16464	.24628	.22744

#1	4829.2	66187.	8574.0
#2	4820.8	65989.	8613.1
#3	4836.7	65865.	8594.1

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126202 Acquired: 2/27/2017 22:49:15 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0022	.03547	.00801	.06186	31.651	.00040	F 1151.6
Stddev	.00114	.00580	.00439	.00442	.198	.00006	10.8
%RSD	513.42	16.353	54.767	7.1401	.62675	13.799	.93444

#1	-.00151	.03342	.00316	.05676	31.755	.00045	1163.4
#2	.00062	.03097	.00918	.06424	31.776	.00042	1142.4
#3	.00023	.04201	.01169	.06457	31.422	.00034	1149.0

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00690	.01540	.00392	.02110	36.599	104.05	.82180
Stddev	.00038	.00071	.00130	.00175	.108	.44	.00043
%RSD	5.4450	4.6027	33.304	8.2911	.29389	.41993	.05253

#1	.00679	.01507	.00511	.02285	36.482	103.61	.82130
#2	.00659	.01491	.00252	.02109	36.620	104.06	.82204
#3	.00732	.01621	.00411	.01935	36.694	104.48	.82205

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	156.43	23.309	.00292	F 437.83	.03750	.04341	-.00313
Stddev	.35	.097	.00113	7.19	.00236	.01997	.00664
%RSD	.22290	.41633	38.685	1.6412	6.3021	46.002	212.00

#1	156.25	23.203	.00178	429.92	.03549	.06056	-.00577
#2	156.21	23.328	.00404	439.64	.03692	.02149	.00442
#3	156.83	23.395	.00296	443.94	.04010	.04819	-.00804

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126202 Acquired: 2/27/2017 22:49:15 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.02602	F -.05312	3.7179	.00327	F 41.795	F -.11030	.00485
Stddev	.00881	.00997	.0112	.00114	.427	.00373	.00432
%RSD	33.840	18.770	.30069	34.823	1.0210	3.3792	89.113

#1	-.01822	-.06424	3.7266	.00198	41.463	-.10998	.00543
#2	-.03557	-.05014	3.7218	.00415	41.647	-.11418	.00886
#3	-.02428	-.04497	3.7053	.00368	42.277	-.10675	.00027

Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit	45.000	90.000			9.0000	36.000	
Low Limit	-.02000	-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00110	.00139	F -1.5447
Stddev	.00110	.00010	.2441
%RSD	99.761	7.2286	15.804

#1	-.00017	.00135	-1.4389
#2	.00175	.00132	-1.8239
#3	.00171	.00151	-1.3714

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4238.3	57933.	8241.4
Stddev	4.7	173.	64.2
%RSD	.11129	.29912	.77952

#1	4234.1	58117.	8283.0
#2	4237.4	57773.	8273.9
#3	4243.4	57909.	8167.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126203 Acquired: 2/27/2017 22:53:33 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00157	.02169	.00141	.02480	.46993	-0.00000	F 459.31
Stddev	.00085	.00697	.00035	.00223	.00155	.00001	.50
%RSD	53.816	32.145	24.779	8.9961	.32881	1348.9	.10990

#1	-0.00225	.02304	.00101	.02683	.46836	.00001	459.14
#2	-0.00184	.02788	.00167	.02241	.46997	-0.00001	458.91
#3	-0.00062	.01414	.00154	.02515	.47145	-0.00000	459.87

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00135	.00647	.03875	.00466	2.6571	9.7497	.02290
Stddev	.00036	.00051	.00060	.00148	.0167	.0233	.00257
%RSD	26.911	7.8452	1.5406	31.859	.62826	.23929	11.229

#1	.00176	.00616	.03808	.00358	2.6621	9.7574	.02231
#2	.00121	.00618	.03896	.00404	2.6708	9.7682	.02067
#3	.00108	.00705	.03921	.00635	2.6385	9.7235	.02571

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	57.289	9.5001	.00071	98.314	.02950	-0.01530	.00122
Stddev	.103	.0109	.00023	.320	.00405	.00774	.00286
%RSD	.18046	.11477	32.528	.32582	13.734	50.593	233.56

#1	57.204	9.5008	.00083	97.952	.02502	-0.02245	.00442
#2	57.259	9.4888	.00045	98.563	.03058	-0.00708	.00036
#3	57.404	9.5106	.00086	98.426	.03290	-0.01637	-.00110

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702126203 Acquired: 2/27/2017 22:53:33 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.1288	-0.0578	2.3734	-0.0046	5.2474	F -0.04439	.00133
Stddev	.00397	.01407	.0051	.00118	.0059	.00178	.00132
%RSD	30.834	243.27	.21649	256.29	.11153	4.0049	99.188

#1	-0.00930	.00333	2.3726	.00086	5.2408	-0.04634	.00261
#2	-0.01219	.00131	2.3687	-0.0084	5.2499	-0.04398	-0.00003
#3	-0.01715	-0.02199	2.3789	-0.00140	5.2517	-0.04286	.00142

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit						36.000	
Low Limit						-0.3000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00154	.00377	F -.21203
Stddev	.00062	.00017	.16992
%RSD	40.209	4.6158	80.140

#1	.00095	.00359	-.10808
#2	.00218	.00380	-.11990
#3	.00150	.00393	-.40813

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-0.4000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4885.0	67101.	8667.5
Stddev	8.9	304.	45.9
%RSD	.18212	.45238	.53005

#1	4880.9	67407.	8720.0
#2	4878.9	66800.	8634.6
#3	4895.2	67096.	8648.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126204 Acquired: 2/27/2017 22:57:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0012	.03823	-0.00441	.02766	1.2812	.00015	F 816.51
Stddev	.00149	.00455	.00222	.00334	.0027	.00007	3.83
%RSD	1210.2	11.912	50.245	12.058	.21084	50.302	.46873

#1	.00154	.04301	-.00697	.03058	1.2827	.00018	816.64
#2	-.00059	.03394	-.00321	.02838	1.2828	.00020	812.61
#3	-.00133	.03773	-.00306	.02403	1.2781	.00006	820.27

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00334	.01330	.08979	.01073	1.8165	14.347	.04163
Stddev	.00027	.00062	.00074	.00041	.0162	.144	.00306
%RSD	8.1679	4.6462	.82797	3.8656	.88946	1.0072	7.3572

#1	.00315	.01276	.08987	.01117	1.8231	14.181	.04435
#2	.00322	.01398	.08901	.01035	1.7981	14.445	.03831
#3	.00365	.01317	.09049	.01068	1.8284	14.414	.04222

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	122.54	20.069	.00231	F 278.32	.05898	.00388	.00936
Stddev	.19	.046	.00016	3.44	.00136	.00923	.00521
%RSD	.15638	.23023	7.0414	1.2359	2.2992	237.56	55.678

#1	122.50	20.106	.00225	275.08	.05966	.01047	.00335
#2	122.75	20.083	.00249	281.93	.05742	-.00666	.01207
#3	122.38	20.017	.00218	277.96	.05987	.00785	.01265

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702126204 Acquired: 2/27/2017 22:57:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.1284	F -0.02871	3.8033	.00077	F 20.587	F -0.07774	.00840
Stddev	.01104	.00583	.0099	.00099	.208	.00365	.00375
%RSD	85.995	20.297	.26080	128.15	1.0086	4.7003	44.704

#1	-.01516	-.02232	3.8102	.00026	20.438	-.07959	.00413
#2	-.02254	-.03010	3.8077	.00191	20.824	-.08011	.01119
#3	-.00082	-.03372	3.7919	.00014	20.499	-.07353	.00988

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass
High Limit		90.000			9.0000	36.000	
Low Limit		-.01000			-.01000	-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00195	.00320	F -.05378
Stddev	.00100	.00024	.31075
%RSD	51.219	7.4713	577.78

#1	.00080	.00293	-.04800
#2	.00239	.00329	-.36739
#3	.00264	.00338	.25404

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4583.3	62852.	8452.7
Stddev	7.4	167.	43.3
%RSD	.16234	.26518	.51230

#1	4584.5	62918.	8485.7
#2	4575.3	62663.	8403.7
#3	4590.0	62976.	8468.7

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132701 Acquired: 2/27/2017 23:01:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00274	1.1930	.01152	.08763	4.0965	.00040	F 1131.9
Stddev	.00229	.0071	.00448	.00047	.0123	.00005	29.1
%RSD	83.724	.59883	38.866	.53836	.30098	13.106	2.5750

#1	-0.00472	1.2011	.00681	.08783	4.0824	.00045	1102.3
#2	-0.00326	1.1899	.01571	.08797	4.1054	.00040	1132.9
#3	-0.00023	1.1879	.01203	.08709	4.1017	.00034	1160.6

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00400	.00358	.00390	.03525	13.376	12.320	.15947
Stddev	.00035	.00052	.00104	.00152	.069	.021	.00286
%RSD	8.7942	14.408	26.590	4.3208	.51418	.16998	1.7911

#1	.00425	.00357	.00295	.03700	13.297	12.343	.15914
#2	.00415	.00307	.00373	.03452	13.406	12.302	.16247
#3	.00360	.00411	.00500	.03423	13.424	12.315	.15679

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	85.293	3.1747	.00403	36.225	.08086	.87610	.00600
Stddev	.186	.0152	.00162	.193	.00375	.00792	.00442
%RSD	.21798	.47806	40.316	.53312	4.6409	.90389	73.690

#1	85.084	3.1695	.00221	36.009	.08496	.88184	.00291
#2	85.352	3.1918	.00532	36.380	.07759	.86707	.01106
#3	85.442	3.1628	.00457	36.287	.08003	.87939	.00402

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132701 Acquired: 2/27/2017 23:01:30 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.1227	F -0.0411	16.886	.00279	3.4502	F -0.08513	-0.0806
Stddev	.00797	.00941	.002	.00052	.0146	.00179	.00500
%RSD	64.970	23.467	.00966	18.520	.42353	2.1038	62.038

#1	-.02092	-.04166	16.888	.00336	3.4337	-.08515	-.00805
#2	-.00520	-.04865	16.885	.00234	3.4615	-.08691	-.01306
#3	-.01070	-.03002	16.886	.00268	3.4553	-.08333	-.00306

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit		90.000				36.000	
Low Limit		-.01000				-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00786	.25414	.32720
Stddev	.00057	.00027	.11439
%RSD	7.2909	.10506	34.961

#1	.00771	.25402	.45310
#2	.00737	.25395	.22966
#3	.00849	.25444	.29883

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4554.4	62401.	8636.9
Stddev	10.2	589.	26.8
%RSD	.22405	.94340	.31016

#1	4556.7	61762.	8652.9
#2	4563.2	62516.	8651.8
#3	4543.2	62923.	8606.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132702 Acquired: 2/27/2017 23:05:21 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00175	.01166	-0.00571	.01281	.20427	-0.00008	130.72	.00006
Stddev	.00317	.00596	.00310	.00027	.00116	.00004	.68	.00027
%RSD	181.84	51.159	54.390	2.1325	.56992	53.835	.51851	471.60

#1	-0.00342	.00478	-0.00926	.01249	.20296	-0.00007	130.18	.00036
#2	.00192	.01486	-0.00434	.01298	.20518	-0.00012	131.48	-0.00007
#3	-0.00373	.01534	-0.00352	.01295	.20468	-0.00004	130.50	-0.00012

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00025	.00054	.00308	.01699	10.791	.04522	20.636	.03788
Stddev	.00029	.00049	.00024	.01154	.095	.00117	.125	.00086
%RSD	113.19	89.767	7.9095	67.938	.87941	2.5869	.60440	2.2762

#1	-0.00006	.00110	.00336	.02428	10.901	.04388	20.644	.03855
#2	.00051	.00031	.00297	.02301	10.738	.04583	20.756	.03691
#3	.00031	.00021	.00291	.00368	10.735	.04597	20.507	.03819

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00063	32.906	.05086	-0.00712	-0.00458	-0.00102	.00015	2.7640
Stddev	.00063	.020	.00154	.00594	.00558	.00664	.01641	.0116
%RSD	100.17	.06053	3.0216	83.509	121.85	647.67	11163.	.41976

#1	.00116	32.893	.04935	-0.00101	.00121	-0.00866	-.01659	2.7524
#2	-0.00007	32.929	.05242	-0.00746	-0.00502	.00226	.00082	2.7641
#3	.00079	32.896	.05081	-0.01288	-0.00993	.00333	.01621	2.7756

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132702 Acquired: 2/27/2017 23:05:21 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0013	.49358	-0.1149	-0.0528	.00047	.00153	.21383
Stddev	.00120	.00176	.00318	.00835	.00068	.00037	.31070
%RSD	913.81	.35595	27.678	158.07	143.86	24.384	145.30

#1	-0.00151	.49276	-0.1504	-.00905	-.00025	.00184	.08339
#2	.00064	.49560	-.00892	.00429	.00109	.00164	.56849
#3	.00048	.49239	-.01049	-.01108	.00057	.00112	-.01038

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5267.6	72555.	9099.8
Stddev	14.0	185.	29.4
%RSD	.26595	.25545	.32309

#1	5266.0	72725.	9111.3
#2	5282.3	72357.	9066.3
#3	5254.5	72584.	9121.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132702MS Acquired: 2/27/2017 23:09:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19828	5.0472	.20501	.95704	.70218	.02481	129.35	.02497
Stddev	.00232	.0206	.00478	.00300	.00063	.00012	.06	.00038
%RSD	1.1717	.40795	2.3319	.31394	.08935	.47099	.04748	1.5046

#1	.20056	5.0577	.20924	.95940	.70178	.02473	129.28	.02533
#2	.19591	5.0235	.19982	.95366	.70186	.02475	129.40	.02499
#3	.19838	5.0605	.20597	.95807	.70291	.02494	129.38	.02458

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09868	.24760	.25106	1.8982	36.882	.57146	24.292	.26808
Stddev	.00036	.00258	.00033	.0137	.055	.00426	.129	.00186
%RSD	.36817	1.0405	.13223	.72311	.14888	.74505	.52984	.69562

#1	.09850	.24463	.25119	1.8986	36.908	.57313	24.144	.26597
#2	.09844	.24888	.25069	1.8843	36.819	.57463	24.355	.26879
#3	.09910	.24928	.25131	1.9118	36.919	.56662	24.378	.26949

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50277	57.424	.29554	5.0631	.25073	.59352	.18688	5.3078
Stddev	.00158	.232	.00409	.0184	.00251	.00332	.00720	.0133
%RSD	.31421	.40407	1.3831	.36286	1.0012	.55998	3.8519	.25139

#1	.50117	57.264	.29716	5.0762	.25102	.59087	.19177	5.3232
#2	.50280	57.317	.29856	5.0711	.24809	.59245	.17862	5.3014
#3	.50433	57.690	.29089	5.0421	.25309	.59725	.19026	5.2990

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702132702MS Acquired: 2/27/2017 23:09:08 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-04

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49717	.97366	.48301	.24192	.50236	.49098	.26418
Stddev	.00187	.00157	.00200	.00618	.00087	.00089	.07894
%RSD	.37550	.16155	.41341	2.5564	.17350	.18215	29.883
#1	.49918	.97194	.48441	.24835	.50248	.49019	.28843
#2	.49548	.97402	.48072	.24137	.50144	.49081	.17596
#3	.49686	.97502	.48390	.23602	.50317	.49195	.32816

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5203.1	72005.	9058.7
Stddev	43.5	243.	22.5
%RSD	.83618	.33780	.24892
#1	5246.9	71973.	9035.6
#2	5202.6	71779.	9080.6
#3	5159.9	72262.	9060.0

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132702MSD Acquired: 2/27/2017 23:12:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19698	4.9626	.20027	.94436	.70029	.02454	132.37	.02474
Stddev	.00277	.0086	.00530	.00798	.00204	.00010	.80	.00021
%RSD	1.4067	.17324	2.6483	.84509	.29186	.39620	.60571	.84029

#1	.19724	4.9638	.19424	.95303	.69898	.02465	131.83	.02495
#2	.19961	4.9705	.20235	.93733	.69925	.02446	131.99	.02454
#3	.19409	4.9534	.20421	.94271	.70265	.02452	133.29	.02473

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09731	.24390	.24448	1.8624	36.892	.56665	24.657	.26597
Stddev	.00032	.00280	.00194	.0238	.146	.00332	.115	.00203
%RSD	.32489	1.1473	.79180	1.2798	.39516	.58653	.46514	.76281

#1	.09746	.24384	.24654	1.8660	36.843	.56786	24.548	.26364
#2	.09753	.24673	.24419	1.8370	37.055	.56289	24.645	.26734
#3	.09695	.24114	.24270	1.8843	36.776	.56921	24.777	.26693

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49565	57.996	.29013	4.9216	.24134	.58255	.19020	5.2593
Stddev	.00126	.195	.00176	.0128	.00187	.00478	.01088	.0082
%RSD	.25392	.33704	.60724	.26072	.77398	.82050	5.7220	.15656

#1	.49668	58.036	.29180	4.9076	.23942	.58190	.18581	5.2539
#2	.49425	58.167	.28829	4.9245	.24315	.57812	.18220	5.2551
#3	.49603	57.783	.29030	4.9328	.24145	.58761	.20259	5.2687

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702132702MSD Acquired: 2/27/2017 23:12:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604286-05

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48835	.97264	.47591	.24067	.49498	.47797	.36863
Stddev	.00120	.00267	.00496	.00771	.00205	.00116	.12754
%RSD	.24594	.27417	1.0418	3.2050	.41340	.24365	34.597
#1	.48907	.97074	.48011	.24617	.49373	.47910	.34968
#2	.48901	.97149	.47044	.24400	.49386	.47805	.50459
#3	.48696	.97569	.47716	.23186	.49734	.47677	.25164

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5207.3	70668.	8782.3
Stddev	45.1	210.	26.5
%RSD	.86628	.29781	.30162
#1	5161.2	70759.	8751.7
#2	5209.5	70427.	8797.3
#3	5251.3	70817.	8798.0

Approved: February 28, 2017

K. K. Beck

Sample Name: CCV Acquired: 2/27/2017 23:16:32 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41610	10.777	.41715	.52247	1.0722	.05255	10.707
Stddev	.00087	.033	.00234	.00303	.0018	.00001	.014
%RSD	.20944	.30371	.56059	.57984	.16934	.01325	.12943

#1	.41547	10.767	.41915	.52097	1.0737	.05255	10.722
#2	.41709	10.750	.41772	.52048	1.0729	.05255	10.701
#3	.41573	10.813	.41458	.52596	1.0702	.05254	10.696

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05249	.21039	.52915	.52828	3.9712	F 56.023	F 1.1170
Stddev	.00040	.00062	.00086	.00123	.0273	.284	.0006
%RSD	.75360	.29295	.16281	.23242	.68836	.50777	.05378

#1	.05212	.21106	.52882	.52951	3.9875	56.291	1.1164
#2	.05291	.20985	.53013	.52828	3.9865	56.054	1.1171
#3	.05243	.21026	.52851	.52706	3.9397	55.724	1.1176

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail
Value						50.000	1.0000
Range						10.000%	10.000%

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.063	.48721	1.0424	F 55.241	.52939	10.494	.53258
Stddev	.112	.00304	.0025	.307	.00110	.011	.00071
%RSD	1.1123	.62357	.24247	.55502	.20721	.10499	.13365

#1	10.030	.48908	1.0435	55.413	.52899	10.507	.53237
#2	9.9719	.48884	1.0395	55.424	.52856	10.486	.53337
#3	10.188	.48370	1.0442	54.887	.53064	10.491	.53199

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				50.000			
Range				10.000%			

Approved: February 28, 2017

K. K. Beck

Sample Name: CCV Acquired: 2/27/2017 23:16:32 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2586	.42003	5.2511	1.0554	1.0646	1.0393	.53752
Stddev	.0089	.00816	.0033	.0023	.0034	.0105	.00387
%RSD	.70514	1.9416	.06284	.21808	.32025	1.0117	.71950

#1	1.2549	.41299	5.2504	1.0577	1.0675	1.0469	.53809
#2	1.2521	.41812	5.2483	1.0531	1.0653	1.0436	.53340
#3	1.2687	.42897	5.2547	1.0552	1.0608	1.0273	.54107

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0532	1.0611	1.0722
Stddev	.0013	.0017	.2171
%RSD	.11979	.15901	20.251

#1	1.0528	1.0624	1.1488
#2	1.0522	1.0592	1.2406
#3	1.0546	1.0617	.82711

Check ?	Chk Pass	Chk Pass	Chk Pass
Value			
Range			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5209.3	70992.	8801.2
Stddev	9.8	304.	70.1
%RSD	.18813	.42878	.79611

#1	5214.2	71311.	8878.0
#2	5215.7	70961.	8740.7
#3	5198.0	70704.	8785.0

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 23:20:07 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00374	.00040	-0.00264	.00094	.00018	-0.00001	-0.01008
Stddev	.00029	.00286	.00118	.00172	.00005	.00013	.00601
%RSD	7.7626	718.50	44.614	182.60	29.584	1147.0	59.640

#1	-0.00347	.00258	-0.00332	.00094	.00014	.00004	-0.00464
#2	-0.00368	-0.00284	-0.00333	.00266	.00016	.00008	-0.00907
#3	-0.00405	.00145	-0.00128	-0.00077	.00024	-0.00016	-0.01654

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00002	.00044	-0.00089	.00065	-0.00567	.25110	.00293
Stddev	.00035	.00036	.00138	.00111	.00871	.05211	.00304
%RSD	1689.9	80.971	154.19	170.62	153.80	20.754	103.88

#1	.00035	.00067	-0.00185	.00008	.00116	.30994	.00120
#2	-0.00007	.00062	-0.00151	-0.00006	-0.00267	.21078	.00114
#3	-0.00034	.00003	.00068	.00193	-0.01548	.23257	.00644

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.03049	.00032	-0.00046	.06234	-0.00097	-0.00264	-0.00421
Stddev	.03946	.00117	.00053	.01928	.00149	.00060	.00446
%RSD	129.42	363.81	115.66	30.926	153.65	22.789	105.91

#1	-0.00998	.00161	-0.00088	.05694	.00015	-0.00292	-0.00559
#2	-0.07598	-0.00067	.00014	.08375	-0.00265	-0.00305	.00078
#3	-0.00551	.00002	-0.00063	.04634	-0.00040	-0.00195	-0.00782

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 23:20:07 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00680	-0.00757	.00015	-0.00083	.00021	-0.00464	-0.00409
Stddev	.00552	.00446	.00345	.00122	.00025	.00337	.00112
%RSD	81.274	58.906	2304.4	146.72	119.43	72.602	27.395

#1	-.01244	-.01248	-.00244	-.00061	.00007	-.00194	-.00295
#2	-.00656	-.00644	.00406	-.00216	.00051	-.00842	-.00518
#3	-.00140	-.00378	-.00117	.00026	.00006	-.00357	-.00413

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00012	.00024	F .15258
Stddev	.00064	.00023	.26072
%RSD	537.47	95.247	170.88

#1	.00036	.00025	.34687
#2	-.00085	.00046	-.14373
#3	.00014	.00000	.25459

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5189.4	71226.	8746.1
Stddev	25.9	415.	70.2
%RSD	.49934	.58251	.80291

#1	5167.6	70976.	8812.3
#2	5218.1	70998.	8672.5
#3	5182.6	71705.	8753.4

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135901 Acquired: 2/27/2017 23:23:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00343	.15800	-0.00187	.01518	.08845	-0.00005	69.954	.00031
Stddev	.00226	.00285	.00303	.00400	.00032	.00005	.090	.00011
%RSD	65.778	1.8029	161.62	26.328	.36568	91.709	.12795	36.368

#1	-0.00576	.16017	-0.00501	.01918	.08821	-0.00008	70.016	.00040
#2	-0.00126	.15477	-0.00163	.01119	.08831	.00000	69.995	.00036
#3	-0.00327	.15905	.00102	.01517	.08882	-0.00008	69.851	.00018

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00066	.00003	.01275	.28675	1.0151	.00928	5.2600	.00918
Stddev	.00030	.00095	.00113	.00519	.1053	.00072	.0484	.00058
%RSD	45.355	2767.7	8.8257	1.8113	10.371	7.7251	.92008	6.3715

#1	.00032	.00089	.01402	.28933	1.1350	.00857	5.2283	.00935
#2	.00088	-.00098	.01235	.29015	.93778	.01000	5.2361	.00853
#3	.00077	.00020	.01187	.28077	.97263	.00925	5.3157	.00966

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00042	5.5158	.00431	-.00317	-.00019	-.00375	-.00541	3.7845
Stddev	.00029	.0179	.00142	.00032	.00164	.00665	.01305	.0103
%RSD	67.537	.32491	32.850	10.168	869.31	177.22	241.28	.27257

#1	.00073	5.5289	.00479	-.00288	-.00180	.00379	-.01595	3.7765
#2	.00017	5.5231	.00543	-.00312	-.00024	-.00629	-.00947	3.7961
#3	.00037	5.4954	.00272	-.00352	.00148	-.00876	.00919	3.7809

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135901 Acquired: 2/27/2017 23:23:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0074	.21157	-0.00593	-0.00122	.00054	.00593	.35201
Stddev	.00046	.00027	.00106	.00623	.00127	.00024	.21090
%RSD	62.314	.12880	17.949	511.49	233.84	3.9940	59.913

#1	-0.0035	.21185	-0.00552	-0.00143	-0.00092	.00613	.16159
#2	-0.00125	.21155	-0.00714	.00511	.00137	.00567	.57869
#3	-0.00063	.21130	-0.00513	-0.00733	.00118	.00600	.31575

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5225.3	71999.	8584.3
Stddev	7.7	255.	49.8
%RSD	.14652	.35451	.58005

#1	5233.1	72157.	8576.2
#2	5224.9	72136.	8539.0
#3	5217.8	71705.	8637.6

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135901PS Acquired: 2/27/2017 23:27:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604329-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19649	5.2604	.20021	.95952	.58829	.02490	67.811	.02475
Stddev	.00120	.0305	.00273	.00448	.00166	.00005	.199	.00013
%RSD	.61254	.57967	1.3627	.46692	.28226	.18707	.29293	.52957

#1	.19538	5.2793	.19858	.95435	.58648	.02492	67.613	.02488
#2	.19777	5.2252	.19869	.96194	.58975	.02493	67.809	.02462
#3	.19632	5.2767	.20336	.96228	.58865	.02485	68.011	.02477

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10001	.25076	.26186	2.1365	27.572	.54197	9.4662	.23961
Stddev	.00023	.00154	.00101	.0121	.095	.00393	.1437	.00094
%RSD	.23260	.61600	.38745	.56638	.34274	.72575	1.5179	.39065

#1	.09981	.24922	.26268	2.1246	27.465	.54450	9.5022	.23877
#2	.09994	.25075	.26217	2.1488	27.643	.54397	9.5884	.23944
#3	.10026	.25231	.26072	2.1362	27.608	.53744	9.3079	.24062

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50199	31.311	.25160	4.9831	.25535	.58836	.19640	5.9017
Stddev	.00182	.185	.00152	.0064	.00142	.00505	.00872	.0118
%RSD	.36258	.59015	.60600	.12859	.55768	.85811	4.4380	.20057

#1	.50145	31.107	.24984	4.9780	.25517	.58749	.19830	5.9114
#2	.50402	31.359	.25237	4.9903	.25685	.58381	.20401	5.8885
#3	.50051	31.467	.25258	4.9811	.25402	.59379	.18689	5.9052

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: February 28, 2017

K. K. Beck

Sample Name: L1702135901PS Acquired: 2/27/2017 23:27:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604329-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50601	.69561	.48931	.24942	.50251	.50162	.31166
Stddev	.00151	.00120	.00476	.01425	.00055	.00064	.11559
%RSD	.29865	.17180	.97243	5.7144	.10915	.12755	37.090
#1	.50432	.69448	.49086	.23827	.50309	.50226	.44460
#2	.50648	.69686	.48397	.26548	.50247	.50162	.25555
#3	.50723	.69549	.49310	.24450	.50199	.50098	.23483

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5087.8	68858.	8717.7
Stddev	39.1	394.	146.7
%RSD	.76757	.57198	1.6829
#1	5044.8	68433.	8859.5
#2	5097.7	69211.	8727.0
#3	5121.0	68932.	8566.5

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135901SDL Acquired: 2/27/2017 23:31:28 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604329-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00103	.04716	-0.00405	.00532	.01803	-0.00005	14.416	.00014
Stddev	.00021	.01042	.00259	.00405	.00021	.00009	.038	.00043
%RSD	20.862	22.096	63.939	76.021	1.1810	207.00	.26155	310.95

#1	-0.00079	.04221	-0.00632	.00101	.01779	-0.00015	14.435	-0.00008
#2	-0.00119	.04013	-0.00460	.00903	.01820	.00000	14.373	-0.00014
#3	-0.00112	.05913	-0.00123	.00594	.01809	.00002	14.441	.00063

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00003	.00008	.00184	.05980	.37424	.00161	1.0347	.00055
Stddev	.00027	.00076	.00082	.00651	.04818	.00257	.0385	.00162
%RSD	780.76	981.14	44.687	10.888	12.874	159.78	3.7204	295.76

#1	.00026	.00050	.00265	.05433	.40917	.00457	1.0118	-0.00132
#2	-0.00027	.00053	.00187	.06700	.39428	.00001	1.0791	.00145
#3	-0.00009	-0.00080	.00101	.05807	.31928	.00024	1.0131	.00151

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00003	1.1399	.00035	.01105	-0.00169	.00007	-0.00315	.77240
Stddev	.00097	.0400	.00045	.00372	.00254	.00511	.00499	.00086
%RSD	3693.7	3.5072	129.39	33.699	149.95	6926.5	158.48	.11096

#1	-0.00008	1.1241	.00081	.01171	.00034	-0.00565	-0.00109	.77316
#2	-0.00096	1.1103	.00033	.00705	-0.00089	.00417	.00048	.77255
#3	.00097	1.1854	-0.00009	.01441	-0.00454	.00170	-0.00884	.77147

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: February 28, 2017

Ki K Buck

Sample Name: L1702135901SDL Acquired: 2/27/2017 23:31:28 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604329-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00196	.04272	-0.00646	-0.00864	-0.00052	.00138	.09785
Stddev	.00073	.00057	.00220	.00673	.00095	.00011	.17951
%RSD	37.084	1.3420	34.077	77.813	182.55	7.6778	183.46

#1	.00193	.04290	-0.00885	-0.01288	.00007	.00143	.07907
#2	.00125	.04208	-0.00452	-0.00089	-0.00162	.00145	.28601
#3	.00271	.04318	-0.00601	-0.01216	-0.00002	.00125	-0.07153

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5330.6	73081.	8740.3
Stddev	30.9	1057.	38.7
%RSD	.57984	1.4461	.44313

#1	5356.6	74249.	8728.7
#2	5296.4	72804.	8783.5
#3	5338.7	72190.	8708.7

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 23:35:18 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41623	10.808	.42125	.52484	1.0679	.05231	10.655
Stddev	.00479	.043	.00706	.00073	.0036	.00011	.049
%RSD	1.1518	.39559	1.6763	.13856	.33388	.21528	.46094

#1	.41811	10.769	.42779	.52403	1.0640	.05226	10.614
#2	.41078	10.803	.41376	.52544	1.0710	.05223	10.709
#3	.41980	10.854	.42222	.52504	1.0687	.05244	10.641

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05242	.21006	.52660	.52879	3.9487	F 55.711	F 1.1121
Stddev	.00014	.00128	.00142	.00160	.0037	.209	.0021
%RSD	.26420	.60720	.26877	.30174	.09340	.37587	.19028

#1	.05239	.21126	.52785	.52838	3.9476	55.655	1.1109
#2	.05230	.21020	.52506	.53054	3.9528	55.536	1.1146
#3	.05257	.20872	.52689	.52743	3.9457	55.943	1.1109

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail
Value						50.000	1.0000
Range						10.000%	10.000%

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.131	.48711	1.0454	F 55.003	.52899	10.446	.53618
Stddev	.026	.00382	.0018	.099	.00448	.030	.00127
%RSD	.26125	.78459	.17497	.17927	.84648	.28447	.23594

#1	10.139	.48698	1.0468	54.970	.53414	10.460	.53741
#2	10.152	.49100	1.0434	54.925	.52610	10.465	.53624
#3	10.101	.48336	1.0462	55.114	.52671	10.411	.53489

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				50.000			
Range				10.000%			

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 23:35:18 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2526	.41570	5.2001	1.0608	1.0587	1.0284	.53676
Stddev	.0136	.00620	.0083	.0039	.0019	.0036	.00289
%RSD	1.0843	1.4923	.15989	.36630	.18130	.34812	.53854

#1	1.2683	.40887	5.2097	1.0648	1.0565	1.0274	.53643
#2	1.2441	.41724	5.1950	1.0605	1.0599	1.0323	.53405
#3	1.2455	.42099	5.1957	1.0571	1.0598	1.0254	.53980

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0492	1.0622	.93791
Stddev	.0029	.0037	.13157
%RSD	.27807	.35151	14.028

#1	1.0466	1.0663	1.0545
#2	1.0487	1.0612	.79528
#3	1.0524	1.0591	.96389

Check ?	Chk Pass	Chk Pass	Chk Pass
Value			
Range			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4993.9	67558.	8494.8
Stddev	18.2	333.	45.1
%RSD	.36405	.49241	.53084

#1	4976.6	67905.	8515.2
#2	4992.3	67528.	8526.0
#3	5012.9	67242.	8443.1

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 23:38:54 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0253	.00281	-0.0194	.00128	.00057	-0.00003	-.03120
Stddev	.00013	.00581	.00144	.00070	.00034	.00004	.01273
%RSD	4.9848	207.14	74.100	55.069	59.326	136.31	40.801

#1	-0.0242	-0.00390	-0.0127	.00087	.00020	-0.00001	-.04043
#2	-0.0267	.00646	-0.0096	.00088	.00064	-0.00008	-.01668
#3	-0.0250	.00585	-0.00359	.00209	.00087	-0.00000	-.03648

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00018	-0.00037	.00070	-0.00081	.00637	.24139	.00195
Stddev	.00023	.00029	.00123	.00076	.00787	.07961	.00480
%RSD	125.79	78.921	174.34	94.099	123.60	32.978	246.42

#1	.00025	-0.00007	.00207	-0.00162	.01148	.15918	-0.00337
#2	.00037	-0.00066	-0.00031	-0.00072	-0.00270	.31811	.00596
#3	-0.00007	-0.00039	.00036	-0.00010	.01033	.24689	.00326

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.02231	.00099	-0.00004	.03777	-0.00004	.00164	-.00487
Stddev	.05262	.00128	.00057	.01067	.00095	.00380	.00242
%RSD	235.86	128.77	1468.1	28.251	2118.3	231.50	49.783

#1	.03726	.00239	-0.00044	.04571	.00080	.00448	-0.00627
#2	-.04171	.00072	-0.00028	.04196	-0.00107	-0.00268	-0.00626
#3	-.06248	-0.00013	.00061	.02564	.00014	.00313	-0.00207

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 23:38:54 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00601	-0.00967	.00186	.00020	.00035	-0.00387	-0.00549
Stddev	.00451	.01507	.00107	.00031	.00032	.00254	.00767
%RSD	74.999	155.86	57.686	151.07	89.339	65.772	139.79

#1	-0.00153	-0.01491	.00189	.00018	-0.00001	-0.00326	.00336
#2	-0.00596	.00732	.00077	-0.00009	.00056	-0.00665	-0.00949
#3	-0.01055	-0.02142	.00292	.00052	.00051	-0.00168	-0.01034

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00003	.00030	F .05859
Stddev	.00030	.00008	.16511
%RSD	1152.7	25.010	281.82

#1	.00035	.00027	-.12408
#2	-0.00026	.00024	.19719
#3	-0.00001	.00038	.10265

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5235.4	70559.	8436.5
Stddev	23.3	218.	52.3
%RSD	.44596	.30952	.61954

#1	5209.8	70369.	8422.7
#2	5241.0	70510.	8392.4
#3	5255.5	70797.	8494.2

Approved: February 28, 2017

K. K. Beck

Sample Name: ICSA Acquired: 2/27/2017 23:42:46 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00306	249.26	-0.00411	.01369	.00015	-0.00003	235.23
Stddev	.00086	.86	.00189	.00130	.00054	.00002	.31
%RSD	28.061	.34492	46.043	9.5108	352.59	61.306	.12992

#1	.00217	248.37	-0.00213	.01282	-0.00038	-0.00004	234.89
#2	.00313	249.32	-0.00590	.01307	.00014	-0.00001	235.35
#3	.00388	250.08	-0.00430	.01519	.00070	-0.00005	235.46

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00035	-0.00046	-0.00075	F .00841	92.393	.12124	.00966
Stddev	.00031	.00021	.00061	.00259	.079	.07377	.00207
%RSD	88.647	45.646	80.983	30.843	.08560	60.843	21.389

#1	.00064	-0.00045	-0.00102	.00933	92.366	.09107	.00741
#2	.00038	-0.00025	-0.00119	.00548	92.331	.06734	.01147
#3	.00002	-0.00068	-0.00006	.01042	92.482	.20531	.01010

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				.00400			
Low Limit				-.00400			

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	242.90	.00307	-0.00072	.09170	-0.00050	.05885	F -.00463
Stddev	1.04	.00262	.00055	.02395	.00541	.00397	.00335
%RSD	.42675	85.554	76.286	26.118	1072.0	6.7506	72.351

#1	242.18	.00037	-0.00101	.11727	-0.00010	.05883	-0.00078
#2	242.44	.00322	-0.00107	.08805	-0.00610	.06284	-0.00686
#3	244.09	.00561	-0.00009	.06978	.00469	.05489	-0.00623

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							.00400
Low Limit							-.00400

Approved: February 28, 2017

K. K. Beck

Sample Name: ICSA Acquired: 2/27/2017 23:42:46 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00780	.00279	.01394	.00055	.00141	-0.00513	-0.00634
Stddev	.01240	.00803	.00603	.00056	.00028	.00300	.00403
%RSD	158.97	287.42	43.285	102.36	19.606	58.416	63.536

#1	-0.00502	.00497	.00795	.00016	.00120	-0.00856	-0.00179
#2	-0.02135	-0.00610	.01383	.00029	.00172	-0.00375	-0.00947
#3	.00297	.00951	.02002	.00119	.00130	-0.00307	-0.00775

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00077	-0.00658	F -2.9221
Stddev	.00136	.00056	.1938
%RSD	175.48	8.4464	6.6307

#1	-0.00085	-0.00682	-2.7712
#2	.00062	-0.00699	-2.8544
#3	-0.00209	-0.00595	-3.1406

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02000
Low Limit			-.02000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4854.2	65880.	8627.1
Stddev	16.1	798.	88.0
%RSD	.33250	1.2115	1.0197

#1	4859.6	66770.	8710.1
#2	4836.0	65643.	8636.4
#3	4866.9	65228.	8534.9

Approved: February 28, 2017

K. K. Beck

Sample Name: ICSAB Acquired: 2/27/2017 23:46:34 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51652	249.47	.24205	.50846	.25511	.25695	235.50
Stddev	.00537	.45	.00354	.00244	.00146	.00026	.27
%RSD	1.0398	.18050	1.4618	.48005	.57403	.10228	.11587

#1	.51695	249.12	.24324	.50708	.25344	.25692	235.19
#2	.51095	249.31	.24483	.51127	.25616	.25670	235.67
#3	.52166	249.97	.23807	.50702	.25574	.25722	235.65

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.45383	.23891	.24750	.25808	92.727	5.6873	.01638
Stddev	.00034	.00100	.00066	.00235	.864	.1039	.00373
%RSD	.07487	.41810	.26794	.91211	.93165	1.8265	22.772

#1	.45397	.23938	.24819	.25680	91.853	5.5711	.01363
#2	.45344	.23776	.24746	.26080	92.748	5.7198	.01489
#3	.45407	.23958	.24686	.25665	93.580	5.7710	.02063

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	243.09	.22899	-.00164	5.5486	.47725	-.01985	.48794
Stddev	1.03	.00030	.00022	.0344	.00221	.00830	.00434
%RSD	.42250	.13225	13.426	.61956	.46394	41.822	.88955

#1	241.93	.22888	-.00162	5.5327	.47956	-.01036	.48329
#2	243.46	.22875	-.00143	5.5251	.47705	-.02576	.49188
#3	243.89	.22933	-.00187	5.5881	.47515	-.02343	.48866

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: ICSAB Acquired: 2/27/2017 23:46:34 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48973	.24731	.00819	.49260	.00138	-.00432	.45403
Stddev	.00156	.00362	.00405	.00057	.00020	.00414	.00345
%RSD	.31826	1.4627	49.453	.11671	14.311	95.992	.76000

#1	.49153	.24355	.01059	.49313	.00160	-.00815	.45045
#2	.48889	.24761	.01047	.49268	.00135	.00008	.45432
#3	.48877	.25077	.00351	.49199	.00121	-.00488	.45733

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.25119	.47646	F -3.2758
Stddev	.00123	.00077	.1324
%RSD	.48876	.16215	4.0420

#1	.25256	.47679	-3.4208
#2	.25019	.47701	-3.1612
#3	.25082	.47558	-3.2456

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02500
Low Limit			-.02500

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4809.3	64988.	8410.0
Stddev	75.5	710.	52.4
%RSD	1.5696	1.0918	.62361

#1	4762.2	65732.	8359.7
#2	4769.4	64913.	8406.0
#3	4896.4	64319.	8464.4

Approved: February 28, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/27/2017 23:50:16 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.41546	10.734	.41854	.51649	1.0717	.05190	10.667
Stddev	.00167	.049	.00267	.00509	.0045	.00017	.054
%RSD	.40209	.46081	.63692	.98494	.42393	.32032	.50644

#1	.41717	10.746	.42072	.52233	1.0667	.05206	10.684
#2	.41540	10.776	.41557	.51299	1.0728	.05173	10.606
#3	.41383	10.679	.41933	.51415	1.0756	.05192	10.710

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05226	.20985	.52727	.52919	3.9658	F 56.000	F 1.1251
Stddev	.00035	.00036	.00109	.00078	.0119	.233	.0051
%RSD	.67812	.17301	.20610	.14784	.29958	.41540	.45140

#1	.05187	.20999	.52843	.52838	3.9562	55.746	1.1265
#2	.05235	.21013	.52711	.52994	3.9791	56.049	1.1195
#3	.05256	.20944	.52627	.52925	3.9623	56.204	1.1293

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail
Value						50.000	1.0000
Range						10.000%	10.000%

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.177	.48999	1.0415	F 55.189	.52789	10.491	.53457
Stddev	.086	.00160	.0036	.290	.00219	.027	.00080
%RSD	.84397	.32734	.34247	.52512	.41431	.25732	.15046

#1	10.276	.48993	1.0424	54.860	.52537	10.503	.53537
#2	10.123	.49162	1.0445	55.404	.52910	10.510	.53376
#3	10.133	.48842	1.0376	55.305	.52921	10.460	.53459

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				50.000			
Range				10.000%			

Approved: February 28, 2017

K. K. Beck

Sample Name: CCV Acquired: 2/27/2017 23:50:16 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2499	.42433	5.2355	1.0567	1.0636	1.0344	.53373
Stddev	.0020	.01049	.0124	.0030	.0025	.0033	.00213
%RSD	.15810	2.4712	.23775	.28492	.23315	.31655	.39903

#1	1.2492	.43310	5.2292	1.0534	1.0614	1.0344	.53481
#2	1.2522	.42717	5.2498	1.0593	1.0630	1.0311	.53512
#3	1.2484	.41271	5.2274	1.0573	1.0663	1.0377	.53128

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0474	1.0598	F 1.1496
Stddev	.0034	.0012	.2536
%RSD	.32589	.11676	22.058

#1	1.0512	1.0608	.85776
#2	1.0447	1.0602	1.2750
#3	1.0462	1.0584	1.3161

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5117.4	68757.	8520.4
Stddev	61.3	266.	88.0
%RSD	1.1971	.38703	1.0333

#1	5158.0	68706.	8588.3
#2	5147.3	68520.	8552.1
#3	5046.9	69045.	8420.9

Approved: February 28, 2017

K. K. Beck

Sample Name: CCB Acquired: 2/27/2017 23:53:52 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00277	-0.00076	.00080	.00359	.00068	.00001	-0.00013
Stddev	.00159	.00437	.00123	.00309	.00116	.00001	.03041
%RSD	57.429	577.66	154.91	86.117	169.19	245.76	23354.

#1	-0.00296	.00365	.00212	.00636	.00164	-0.00001	-.02476
#2	-0.00109	-0.00508	-0.00032	.00415	.00101	.00002	-.00948
#3	-0.00426	-0.00084	.00059	.00026	-0.00060	.00001	.03386

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00017	-0.00014	-0.00145	-0.00126	.01080	.19397	-0.00136
Stddev	.00022	.00058	.00093	.00228	.00693	.02651	.00142
%RSD	131.64	420.51	64.351	181.04	64.168	13.665	104.15

#1	-0.00032	.00026	-0.00127	.00127	.00969	.19066	.00027
#2	.00009	-0.00081	-0.00245	-0.00317	.00449	.22198	-.00205
#3	-0.00028	.00013	-0.00062	-0.00187	.01821	.16927	-.00231

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.03420	-0.00024	.00003	.02415	.00071	-0.00273	-0.00250
Stddev	.02436	.00090	.00032	.02293	.00138	.00581	.00233
%RSD	71.229	375.15	1122.3	94.943	193.18	213.15	93.115

#1	-0.01084	-0.00009	.00003	.02974	.00098	.00176	-.00484
#2	-0.05945	-0.00120	-0.00029	.04376	-0.00078	-0.00065	-.00019
#3	-0.03231	.00058	.00035	-0.00106	.00194	-0.00929	-.00247

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: February 28, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/27/2017 23:53:52 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v270) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00669	-0.00715	-0.00108	.00052	.00009	-0.00381	-0.00330
Stddev	.00164	.00975	.00301	.00021	.00013	.00135	.00298
%RSD	24.554	136.40	277.48	40.947	152.11	35.599	90.267

#1	-0.00583	.00189	.00021	.00046	.00024	-0.00486	-0.00671
#2	-0.00859	-0.01749	.00106	.00076	.00001	-0.00228	-0.00125
#3	-0.00566	-0.00586	-0.00452	.00035	.00001	-0.00428	-0.00193

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00047	.00028	F .19997
Stddev	.00073	.00013	.15149
%RSD	156.08	47.350	75.759

#1	.00025	.00018	.12267
#2	-0.00121	.00043	.37452
#3	-0.00044	.00024	.10272

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5204.2	70925.	8523.7
Stddev	40.4	746.	116.6
%RSD	.77688	1.0524	1.3685

#1	5250.7	70864.	8649.4
#2	5184.0	71700.	8502.8
#3	5177.9	70210.	8418.9

Approved: February 28, 2017

Ki K Buck

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000191	0.039142	0.000000	1.000000
Al 308.215 {109}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000859	0.009242	0.000000	1.000000
As 189.042 {478}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000063	0.020472	0.000000	1.000000
B 249.678 {135}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000147	0.012714	0.000000	1.000000
Ba 455.403 {74}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.010149	1.510536	0.000000	1.000000
Be 313.107 {108}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000190	0.710201	0.000000	1.000000
Ca 422.673 {80}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000174	0.032220	0.000000	1.000000
Cd 228.802 {447}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000489	0.398467	0.000000	1.000000
Co 228.616 {444}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000218	0.304358	0.000000	1.000000
Cr 267.716 {126}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000067	0.034764	0.000000	1.000000
Cu 224.700 {450}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000739	0.093188	0.000000	1.000000
Fe 261.187 {129}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000105	0.012762	0.000000	1.000000
K 766.490 {44}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.008582	0.028297	0.000000	1.000000
Li 670.784 {50}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.003483	0.545738	0.000000	1.000000
Mg 279.079 {121}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000103	0.002771	0.000000	1.000000
Mn 257.610 {131}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000701	0.130463	0.000000	1.000000
Mo 202.030 {467}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000053	0.110868	0.000000	1.000000
Na 589.592 {57}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.002704	0.077392	0.000000	1.000000
Ni 231.604 {446}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000653	0.081977	0.000000	1.000000
P 214.914 {457}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000066	0.009904	0.000000	1.000000
Pb 220.353 {453}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000103	0.051112	0.000000	1.000000
Sb 206.833 {463}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000350	0.021828	0.000000	1.000000
Se 196.090 {472}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000002	0.011797	0.000000	1.000000
Si 212.412 {459}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000359	0.027296	0.000000	1.000000
Sn 189.989 {477}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000113	0.060101	0.000000	1.000000
Sr 407.771 {83}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.001865	2.377915	0.000000	1.000000
Tl 337.280 {100}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000912	0.083409	0.000000	1.000000
Tl 190.856 {477}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.000137	0.015068	0.000000	1.000000
V 292.402 {115}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000037	0.049453	0.000000	1.000000
Y 224.306 {450}* Y 360.073 {94}* Y 377.433 {89}*	<not fit> <not fit> <not fit>	<Never Calibrated> <Never Calibrated> <Never Calibrated>	Linear Linear Linear	1/Conc 1/Conc 1/Conc	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	1.000000 1.000000 1.000000
Zn 206.200 {463}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	0.000413	0.392017	0.000000	1.000000
Zr 339.198 {99}	2/28/2017 15:37:38	2/28/2017 15:37:38	Linear	1/Conc	-0.003310	0.000495	0.000000	1.000000

Approved: March 01, 2017

K. K. Buck

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999788	0.000002	0.002082	0.006940	OK.	1.000000	0.000000	1	0
Al 308.215 {109}	0.999469	0.000019	0.006779	0.022595	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999991	0.000000	0.005124	0.017079	OK.	1.000000	0.000000	1	0
B 249.678 {135}	0.999900	0.000001	0.003051	0.010169	OK.	1.000000	0.000000	1	0
Ba 455.403 {74}	0.999989	0.000045	0.000645	0.002150	OK.	1.000000	0.000000	1	0
Be 313.107 {108}	0.999968	0.000002	0.000079	0.000264	OK.	1.000000	0.000000	1	0
Ca 422.673 {80}	0.999981	0.000013	0.022221	0.074069	OK.	1.000000	0.000000	1	0
Cd 228.802 {447}	0.999986	0.000001	0.000407	0.001356	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	0.999973	0.000003	0.000621	0.002069	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999603	0.000003	0.001362	0.004540	OK.	1.000000	0.000000	1	0
Cu 224.700 {450}	0.999844	0.000005	0.002275	0.007585	OK.	1.000000	0.000000	1	0
Fe 261.187 {129}	0.999996	0.000001	0.016676	0.055588	OK.	1.000000	0.000000	1	0
K 766.490 {44}	0.999928	0.000108	0.072810	0.242701	OK.	1.000000	0.000000	1	0
Li 670.784 {50}	0.999930	0.000064	0.003980	0.013265	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999859	0.000005	0.077468	0.258226	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999923	0.000005	0.002034	0.006781	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999987	0.000004	0.000872	0.002906	OK.	1.000000	0.000000	1	0
Na 589.592 {57}	0.999955	0.000232	0.025931	0.086435	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	0.999389	0.000009	0.002176	0.007254	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999953	0.000006	0.011923	0.039742	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.998902	0.000008	0.005365	0.017882	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999844	0.000003	0.007685	0.025618	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999585	0.000001	0.011734	0.039114	OK.	1.000000	0.000000	1	0
Si 212.412 {459}	0.999993	0.000003	0.004156	0.013852	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999980	0.000002	0.001466	0.004885	OK.	1.000000	0.000000	1	0
Sr 407.771 {83}	0.999992	0.000060	0.000306	0.001020	OK.	1.000000	0.000000	1	0
Ti 337.280 {100}	0.999654	0.000014	0.004836	0.016121	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.995723	0.000006	0.007739	0.025797	OK.	1.000000	0.000000	1	0
V 292.402 {115}	0.999978	0.000002	0.001064	0.003546	OK.	1.000000	0.000000	1	0
Y 224.306 {450}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 360.073 {94}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 377.433 {89}	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999996	0.000007	0.000298	0.000992	OK.	1.000000	0.000000	1	0
Zr 339.198 {99}	0.358860	0.000008	1.115381	3.717936	OK.	1.000000	0.000000	1	0

Approved: March 01, 2017

K. K. Buck

Sample Name: S0 Acquired: 2/28/2017 15:19:05 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00019	.00086	.00006	.00015	.01015	-.00019	.00017
Stddev	.00006	.00005	.00001	.00003	.00041	.00002	.00025
%RSD	29.295	5.2897	21.786	21.048	4.0578	9.1658	142.41

#1	-.00025	.00081	.00008	.00014	.01052	-.00021	-.00006
#2	-.00014	.00087	.00006	.00012	.01021	-.00018	.00015
#3	-.00018	.00089	.00005	.00018	.00971	-.00018	.00043

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00049	.00022	.00007	-.00074	-.00011	.00858	-.00348
Stddev	.00009	.00010	.00002	.00008	.00014	.00135	.00165
%RSD	19.060	45.587	25.074	10.654	136.84	15.685	47.303

#1	.00052	.00028	.00007	-.00068	.00004	.00721	-.00518
#2	.00056	.00027	.00005	-.00083	-.00024	.00864	-.00337
#3	.00038	.00010	.00008	-.00071	-.00012	.00990	-.00189

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.00010	.00070	.00005	-.00271	-.00065	-.00007	.00010
Stddev	.00008	.00042	.00004	.00223	.00010	.00005	.00015
%RSD	81.535	60.122	74.341	82.402	15.071	78.246	146.91

#1	-.00001	.00023	.00002	-.00147	-.00074	-.00011	.00005
#2	-.00016	.00103	.00010	-.00137	-.00067	-.00001	.00027
#3	-.00014	.00085	.00004	-.00529	-.00055	-.00007	-.00002

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00035	-.00000	.00036	.00011	.00186	-.00091	-.00014
Stddev	.00011	.00009	.00005	.00005	.00062	.00037	.00004
%RSD	32.645	3695.6	12.784	41.137	33.250	40.104	28.085

#1	.00031	-.00007	.00040	.00011	.00232	-.00075	-.00010
#2	.00026	-.00004	.00031	.00016	.00212	-.00066	-.00014
#3	.00048	.00010	.00037	.00007	.00116	-.00133	-.00018

Approved: March 01, 2017

K. K. Buck

Sample Name: S0 Acquired: 2/28/2017 15:19:05 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.00004	.00041	-.00331
Stddev	.00002	.00009	.00028
%RSD	56.050	22.150	8.6011

#1	.00002	.00050	-.00313
#2	.00006	.00032	-.00316
#3	.00003	.00041	-.00364

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5165.8	72756.	8942.6
Stddev	14.9	126.	30.7
%RSD	.28904	.17257	.34312

#1	5173.9	72738.	8968.7
#2	5174.9	72890.	8908.8
#3	5148.6	72641.	8950.2

Approved: March 01, 2017

Ki K Buck

Sample Name: S1 Acquired: 2/28/2017 15:22:54 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	Ba4554	Be3131	Ca4226	Cd2288	Co2286
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-0.00003	.00172	.02239	.00009	.00276	.00064	.00067
Stddev	.00007	.00012	.00061	.00002	.00060	.00005	.00004
%RSD	252.89	6.7313	2.7281	24.722	21.588	7.5568	6.4123

#1	.00005	.00161	.02292	.00010	.00333	.00060	.00063
#2	-0.00006	.00172	.02172	.00006	.00214	.00070	.00071
#3	-0.00007	.00184	.02252	.00010	.00280	.00063	.00066

Elem	Cr2677	Cu2247	Fe2611	K_7664	Mn2576	Mo2020	Na5895
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00014	-0.00034	.00031	.02149	.00132	.00101	.03070
Stddev	.00005	.00009	.00041	.00215	.00002	.00007	.00052
%RSD	36.127	25.664	129.75	10.025	1.8258	6.7415	1.7022

#1	.00012	-0.00028	.00031	.02300	.00132	.00108	.03029
#2	.00011	-0.00030	-0.00009	.02244	.00129	.00094	.03129
#3	.00020	-0.00044	.00072	.01902	.00134	.00101	.03053

Elem	Ni2316	P_2149	Pb2203	Sb2068	Si2124	Sn1899	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-0.00055	.00069	.00012	.00062	.00136	.00065	.02168
Stddev	.00006	.00004	.00010	.00004	.00008	.00005	.00013
%RSD	10.282	6.0980	80.215	6.1601	5.5883	7.4159	.60092

#1	-0.00052	.00068	.00023	.00066	.00143	.00062	.02161
#2	-0.00061	.00066	.00003	.00060	.00136	.00063	.02161
#3	-0.00051	.00074	.00011	.00060	.00128	.00071	.02183

Elem	Ti3372	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-0.00010	.00044	.00359	-0.00348
Stddev	.00038	.00005	.00010	.00004
%RSD	391.99	11.224	2.7307	1.1875

#1	-0.00020	.00043	.00353	-0.00351
#2	.00032	.00039	.00371	-0.00350
#3	-0.00041	.00049	.00354	-0.00343

Approved: March 01, 2017

K. K. Buck

Sample Name: S1 Acquired: 2/28/2017 15:22:54 Type: Cal
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5107.2	70196.	8677.0
Stddev	8.4	417.	65.3
%RSD	.16511	.59372	.75273
#1	5116.1	70215.	8752.2
#2	5099.3	69771.	8644.4
#3	5106.2	70604.	8634.4

Approved: March 01, 2017

Ki K Buck

Sample Name: S2 Acquired: 2/28/2017 15:26:43 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00010	.00296	.00019	.00026	.03539	.00038	.00508
Stddev	.00010	.00004	.00002	.00004	.00136	.00003	.00080
%RSD	98.576	1.3400	10.618	13.835	3.8308	6.5273	15.695

#1	-.00001	.00293	.00017	.00028	.03671	.00039	.00594
#2	.00018	.00300	.00019	.00022	.03545	.00040	.00436
#3	.00012	.00295	.00021	.00029	.03400	.00036	.00494

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00081	.00127	.00030	.00018	.00072	.03398	.00385
Stddev	.00009	.00007	.00004	.00019	.00016	.00180	.00077
%RSD	11.334	5.1314	13.206	105.76	21.670	5.3074	20.058

#1	.00071	.00120	.00032	.00034	.00088	.03334	.00351
#2	.00088	.00128	.00031	-.00003	.00057	.03601	.00474
#3	.00084	.00133	.00025	.00023	.00071	.03258	.00331

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00044	.00164	.00189	.06638	-.00000	.00157	.00053
Stddev	.00014	.00018	.00003	.00098	.00007	.00004	.00013
%RSD	32.902	10.922	1.7284	1.4805	2403.2	2.8555	25.323

#1	.00060	.00178	.00191	.06580	-.00005	.00160	.00069
#2	.00040	.00144	.00191	.06752	-.00004	.00160	.00045
#3	.00032	.00169	.00185	.06583	.00008	.00152	.00046

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.00080	.00010	.00236	.00107	.04084	.00084	-.00016
Stddev	.00006	.00005	.00006	.00001	.00055	.00031	.00006
%RSD	7.8830	47.187	2.5964	1.0018	1.3504	36.881	38.718

#1	.00084	.00006	.00230	.00106	.04114	.00052	-.00022
#2	.00072	.00015	.00241	.00107	.04021	.00086	-.00018
#3	.00082	.00010	.00238	.00108	.04118	.00114	-.00009

Approved: March 01, 2017

Ki K Buck

Sample Name: S2 Acquired: 2/28/2017 15:26:43 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.00086	.00682	-.00316
Stddev	.00003	.00003	.00052
%RSD	3.5283	.51243	16.383

#1	.00088	.00683	-.00351
#2	.00086	.00678	-.00341
#3	.00082	.00685	-.00257

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5086.5	71278.	8708.3
Stddev	15.8	208.	25.4
%RSD	.30991	.29202	.29190

#1	5090.0	71278.	8737.6
#2	5100.2	71070.	8695.6
#3	5069.2	71486.	8691.8

Approved: March 01, 2017

Ki K Buck

Sample Name: S3 Acquired: 2/28/2017 15:30:33 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.01531	.09521	.00817	.00639	1.5132	.03563	.32017
Stddev	.00025	.00013	.00001	.00001	.0051	.00013	.00084
%RSD	1.6651	.14126	.13684	.16757	.33820	.36811	.26132

#1	.01534	.09512	.00818	.00638	1.5153	.03573	.31983
#2	.01504	.09515	.00816	.00640	1.5074	.03548	.31955
#3	.01554	.09536	.00818	.00639	1.5169	.03566	.32112

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.02225	.06113	.01735	.04622	.05076	1.4150	.54117
Stddev	.00010	.00008	.00004	.00011	.00046	.0039	.00107
%RSD	.44753	.12310	.23413	.23661	.90423	.27473	.19838

#1	.02223	.06120	.01732	.04634	.05042	1.4188	.53998
#2	.02216	.06114	.01739	.04613	.05128	1.4110	.54149
#3	.02236	.06105	.01732	.04617	.05058	1.4151	.54205

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.02754	.06573	.11068	3.8579	.04058	.09793	.02593
Stddev	.00023	.00016	.00029	.0184	.00021	.00025	.00012
%RSD	.82151	.23970	.26293	.47562	.51607	.26027	.44591

#1	.02731	.06556	.11051	3.8728	.04036	.09821	.02603
#2	.02776	.06587	.11101	3.8374	.04060	.09772	.02595
#3	.02755	.06577	.11051	3.8635	.04078	.09787	.02580

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.02589	.00467	.12654	.06013	2.3698	.08160	.00696
Stddev	.00012	.00010	.00031	.00016	.0070	.00028	.00008
%RSD	.47607	2.0694	.24656	.26409	.29408	.34211	1.2177

#1	.02602	.00474	.12683	.05999	2.3698	.08131	.00686
#2	.02588	.00456	.12659	.06030	2.3629	.08164	.00702
#3	.02578	.00470	.12621	.06009	2.3768	.08186	.00699

Approved: March 01, 2017

K. K. Buck

Sample Name: S3 Acquired: 2/28/2017 15:30:33 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.04894	.39080	-.00273
Stddev	.00015	.00049	.00023
%RSD	.31419	.12577	8.3970

#1	.04885	.39028	-.00298
#2	.04886	.39085	-.00269
#3	.04912	.39126	-.00253

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4976.5	69301.	8708.1
Stddev	15.1	271.	31.1
%RSD	.30416	.39151	.35660

#1	4992.8	69609.	8672.6
#2	4973.8	69196.	8730.1
#3	4962.9	69097.	8721.6

Approved: March 01, 2017

Ki K Buck

Sample Name: S4 Acquired: 2/28/2017 15:34:10 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.03104	.18549	.01638	.01288	3.0375	.07263	.64703
Stddev	.00016	.00048	.00005	.00004	.0026	.00010	.00086
%RSD	.50516	.25927	.33194	.33329	.08534	.13531	.13247

#1	.03115	.18556	.01632	.01283	3.0363	.07271	.64773
#2	.03111	.18593	.01642	.01289	3.0404	.07267	.64607
#3	.03086	.18497	.01640	.01292	3.0357	.07252	.64728

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.04409	.12158	.03509	.09235	.10213	2.8425	1.0905
Stddev	.00018	.00027	.00006	.00024	.00073	.0059	.0031
%RSD	.41091	.22359	.17711	.26404	.71312	.20611	.28103

#1	.04427	.12128	.03514	.09237	.10165	2.8460	1.0879
#2	.04391	.12163	.03511	.09209	.10178	2.8357	1.0939
#3	.04409	.12181	.03502	.09258	.10297	2.8457	1.0896

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.05504	.13140	.22186	7.7359	.08130	.19982	.05162
Stddev	.00057	.00129	.00021	.0301	.00008	.00057	.00023
%RSD	1.0419	.98308	.09383	.38846	.10035	.28587	.44383

#1	.05521	.12995	.22192	7.7461	.08139	.19960	.05160
#2	.05551	.13242	.22163	7.7595	.08130	.19939	.05140
#3	.05440	.13182	.22204	7.7021	.08123	.20046	.05185

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.05188	.00948	.25467	.12000	4.7662	.16600	.01361
Stddev	.00013	.00008	.00051	.00023	.0063	.00014	.00003
%RSD	.24411	.88703	.19892	.19303	.13156	.08371	.22543

#1	.05182	.00949	.25451	.11998	4.7590	.16589	.01364
#2	.05180	.00939	.25427	.11978	4.7691	.16594	.01361
#3	.05203	.00955	.25524	.12024	4.7705	.16615	.01358

Approved: March 01, 2017

Ki K Buck

Sample Name: S4 Acquired: 2/28/2017 15:34:10 Type: Cal
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: IR Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	V_2924	Zn2062	Zr3391
Units	Cts/S	Cts/S	Cts/S
Avg	.09911	.78521	-.00237
Stddev	.00017	.00290	.00026
%RSD	.17287	.36894	11.056

#1	.09928	.78378	-.00235
#2	.09911	.78332	-.00212
#3	.09894	.78855	-.00264

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4968.9	67586.	8550.3
Stddev	19.6	294.	99.0
%RSD	.39450	.43505	1.1579

#1	4958.6	67258.	8438.5
#2	4991.5	67673.	8585.5
#3	4956.6	67826.	8626.9

Approved: March 01, 2017

Ki K Buck

Sample Name: ICV Acquired: 2/28/2017 15:37:42 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40014	10.066	.41047	.49718	1.0013	.05056	10.114
Stddev	.00241	.031	.00699	.00307	.0047	.00010	.056
%RSD	.60275	.30633	1.7027	.61650	.46852	.20458	.55105

#1	.40274	10.091	.40267	.49544	.99628	.05045	10.056
#2	.39798	10.076	.41258	.49537	1.0020	.05064	10.118
#3	.39970	10.031	.41616	.50072	1.0056	.05061	10.167

Check ? Value Range	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
---------------------------	----------	----------	----------	----------	----------	----------	----------

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05049	.20161	.50118	.50637	4.0357	50.109	.99455
Stddev	.00017	.00106	.00156	.00222	.0112	.183	.00394
%RSD	.34473	.52572	.31085	.43931	.27658	.36611	.39623

#1	.05061	.20216	.50226	.50409	4.0412	49.902	.99151
#2	.05057	.20227	.49940	.50854	4.0229	50.251	.99315
#3	.05029	.20038	.50189	.50649	4.0431	50.173	.99900

Check ? Value Range	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
---------------------------	----------	----------	----------	----------	----------	----------	----------

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.9981	.50004	F .94433	49.836	.50414	10.018	.50532
Stddev	.0289	.00052	.00144	.130	.00293	.020	.00318
%RSD	.28867	.10435	.15293	.26062	.58151	.19829	.62846

#1	9.9749	.50061	.94362	49.769	.50210	10.041	.50450
#2	9.9889	.49992	.94599	49.754	.50750	10.006	.50264
#3	10.030	.49958	.94337	49.986	.50283	10.008	.50882

Check ? Value Range	Chk Pass	Chk Pass	Chk Fail 1.0000 -5.0000%	Chk Pass	Chk Pass	Chk Pass	Chk Pass
---------------------------	----------	----------	--------------------------------	----------	----------	----------	----------

Approved: March 01, 2017

Ki K Buck

Sample Name: ICV Acquired: 2/28/2017 15:37:42 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2133	.40820	4.8992	1.0158	1.0008	.98869	.51041
Stddev	.0062	.00528	.0106	.0028	.0037	.00757	.00215
%RSD	.51027	1.2923	.21687	.27933	.36641	.76589	.42027

#1	1.2182	.40524	4.8964	1.0189	.99675	.99253	.51289
#2	1.2153	.40506	4.9109	1.0149	1.0018	.97997	.50928
#3	1.2063	.41429	4.8902	1.0135	1.0039	.99357	.50907

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.99315	1.0092	F .79245
Stddev	.00411	.0020	.55823
%RSD	.41334	.19778	70.444

#1	.99773	1.0112	.50665
#2	.98981	1.0073	.43498
#3	.99191	1.0091	1.4357

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-5.0000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4913.1	68499.	8642.6
Stddev	41.5	456.	112.0
%RSD	.84469	.66608	1.2959

#1	4887.1	68898.	8513.4
#2	4961.0	68596.	8701.2
#3	4891.2	68001.	8713.1

Approved: March 01, 2017

Ki K Buck

Sample Name: ICB Acquired: 2/28/2017 15:42:02 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00037	.00072	.00101	.00439	-0.00040	-0.00003	-0.01012
Stddev	.00143	.00351	.00245	.00130	.00037	.00005	.01265
%RSD	388.52	490.82	241.46	29.671	92.068	157.28	124.99

#1	-0.00165	-0.00320	-0.00077	.00403	-0.00018	-0.00004	.00146
#2	-0.00063	.00177	.00001	.00330	-0.00083	.00002	-.02362
#3	.00117	.00358	.00381	.00583	-0.00019	-0.00008	-.00820

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00023	-0.00074	-0.00153	-0.00032	.00474	.17372	-0.00441
Stddev	.00030	.00066	.00074	.00144	.01079	.05293	.00414
%RSD	127.80	89.213	48.773	454.55	227.77	30.468	93.854

#1	-0.00057	-0.00092	-0.00094	-0.00074	.01082	.13367	.00037
#2	-0.00015	-0.00001	-0.00236	.00129	.01111	.23372	-.00676
#3	.00001	-0.00129	-0.00128	-0.00150	-0.00772	.15376	-.00683

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.02805	-0.00174	.00042	-0.00034	.00106	.00823	-0.00461
Stddev	.09075	.00224	.00068	.02856	.00114	.00399	.00249
%RSD	323.57	128.28	161.65	8398.6	107.25	48.470	54.040

#1	-.01269	-0.00325	.00119	.02234	.00059	.00797	-.00339
#2	.05405	.00083	.00017	-.03242	.00235	.01234	-.00747
#3	-.12549	-0.00281	-0.00010	.00906	.00023	.00438	-.00296

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

K. K. Buck

Sample Name: ICB Acquired: 2/28/2017 15:42:02 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00627	.00750	-0.0113	-0.00039	.00006	.00209	-0.00303
Stddev	.00946	.00715	.00258	.00043	.00028	.00182	.00209
%RSD	150.92	95.284	228.43	110.42	473.76	87.248	68.899

#1	.01556	.00661	-0.0406	.00009	.00028	.00004	-0.00535
#2	.00661	.01506	.00080	-0.00073	-0.00025	.00353	-0.00243
#3	-0.00336	.00084	-0.00013	-0.00054	.00015	.00270	-0.00131

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00016	.00001	F .18309
Stddev	.00029	.00004	.51720
%RSD	185.55	309.93	282.48

#1	-0.00012	-0.00003	-0.00150
#2	.00014	.00004	-.21648
#3	.00046	.00003	.76726

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5057.7	70472.	8642.7
Stddev	10.4	259.	56.7
%RSD	.20557	.36807	.65633

#1	5059.1	70648.	8672.7
#2	5046.7	70594.	8678.0
#3	5067.4	70174.	8577.2

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:45:51 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00793	.17976	.00740	.07859	.00790	.00165	.42721
Stddev	.00317	.00684	.00346	.00315	.00017	.00005	.01594
%RSD	40.009	3.8041	46.733	4.0021	2.1796	2.7233	3.7311

#1	.01018	.17440	.00736	.08222	.00778	.00161	.40901
#2	.00931	.18746	.01088	.07677	.00810	.00165	.43868
#3	.00430	.17742	.00396	.07678	.00783	.00170	.43395

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00076	.00385	.00298	.00607	.07889	.89030	.07909
Stddev	.00016	.00021	.00060	.00127	.01166	.00242	.00385
%RSD	21.220	5.3858	20.170	20.927	14.782	.27162	4.8664

#1	.00066	.00388	.00265	.00717	.09144	.88921	.08346
#2	.00068	.00363	.00262	.00468	.07681	.88861	.07760
#3	.00095	.00404	.00367	.00637	.06840	.89307	.07620

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37815	.00889	.00826	.42652	.01761	.81737	.00792
Stddev	.08321	.00244	.00036	.02297	.00075	.00606	.00192
%RSD	22.005	27.479	4.3116	5.3855	4.2756	.74154	24.227

#1	.28257	.01002	.00867	.43258	.01841	.82100	.00574
#2	.41735	.00609	.00808	.44586	.01692	.82074	.00937
#3	.43451	.01057	.00802	.40113	.01749	.81037	.00863

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:45:51 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.08448	.02466	.74649	.41746	.04213	.02828	.17731
Stddev	.00191	.01593	.00572	.00190	.00033	.00217	.00485
%RSD	2.2590	64.594	.76677	.45403	.77390	7.6572	2.7348

#1	.08361	.04073	.74047	.41830	.04244	.03077	.17396
#2	.08667	.02438	.74713	.41879	.04216	.02683	.17509
#3	.08316	.00887	.75187	.41529	.04179	.02724	.18287

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00842	.01804	F 121.62
Stddev	.00027	.00005	.87
%RSD	3.2221	.28494	.71152

#1	.00811	.01798	121.45
#2	.00856	.01806	120.85
#3	.00860	.01807	122.56

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5089.8	71666.	8662.8
Stddev	9.9	379.	47.7
%RSD	.19546	.52900	.55025

#1	5086.5	72074.	8670.6
#2	5081.9	71599.	8706.1
#3	5100.9	71325.	8611.7

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:49:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00851	.18029	.00564	.07506	.00800	.00160	.40912
Stddev	.00111	.00270	.00440	.00184	.00022	.00003	.00541
%RSD	13.089	1.5000	78.088	2.4453	2.8042	1.6518	1.3235

#1	.00781	.18306	.00248	.07315	.00804	.00161	.41422
#2	.00792	.17766	.00377	.07522	.00776	.00162	.40970
#3	.00979	.18016	.01066	.07681	.00821	.00157	.40344

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00088	.00385	.00177	.00540	.07482	.92064	.08006
Stddev	.00037	.00025	.00108	.00287	.01231	.02177	.00164
%RSD	42.118	6.5326	60.716	53.148	16.454	2.3643	2.0451

#1	.00065	.00414	.00297	.00679	.06659	.91244	.07963
#2	.00131	.00375	.00088	.00210	.08897	.94532	.08187
#3	.00068	.00367	.00147	.00730	.06889	.90416	.07868

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.46128	.00725	.00860	.42256	.01688	.80698	.00818
Stddev	.01234	.00110	.00034	.00119	.00168	.01585	.00367
%RSD	2.6755	15.152	3.9152	.28082	9.9701	1.9636	44.805

#1	.47384	.00694	.00883	.42313	.01792	.79795	.01133
#2	.44916	.00634	.00876	.42336	.01778	.79772	.00416
#3	.46085	.00847	.00822	.42120	.01494	.82528	.00906

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:49:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.08495	.01716	.74103	.41514	.04149	.02716	.16833
Stddev	.00654	.00139	.00313	.00361	.00021	.00327	.00393
%RSD	7.7001	8.0806	.42221	.86976	.51640	12.048	2.3376

#1	.07817	.01858	.74302	.41422	.04143	.02339	.17243
#2	.08545	.01582	.73742	.41912	.04173	.02928	.16458
#3	.09123	.01707	.74264	.41208	.04132	.02881	.16797

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00906	.01773	F 120.39
Stddev	.00079	.00028	2.29
%RSD	8.6870	1.5576	1.9035

#1	.00987	.01803	122.03
#2	.00830	.01749	117.77
#3	.00901	.01766	121.36

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5057.4	70714.	8629.8
Stddev	8.4	131.	104.8
%RSD	.16542	.18555	1.2143

#1	5047.8	70807.	8526.1
#2	5063.2	70770.	8735.7
#3	5061.1	70564.	8627.6

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:53:28 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00897	.22691	.01422	.09492	.01001	.00198	.50847
Stddev	.00050	.00331	.00245	.00116	.00061	.00005	.01552
%RSD	5.5267	1.4600	17.204	1.2178	6.0696	2.6140	3.0515

#1	.00912	.22945	.01164	.09612	.01015	.00197	.49726
#2	.00938	.22811	.01451	.09382	.01053	.00193	.52618
#3	.00842	.22316	.01650	.09483	.00934	.00203	.50198

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00082	.00520	.00429	.00493	.11356	1.1107	.10120
Stddev	.00016	.00058	.00035	.00119	.02117	.0787	.00139
%RSD	19.237	11.211	8.2530	24.156	18.644	7.0831	1.3696

#1	.00089	.00584	.00454	.00356	.13467	1.0821	.10098
#2	.00064	.00470	.00389	.00570	.09232	1.0503	.10269
#3	.00094	.00505	.00444	.00552	.11370	1.1997	.09994

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50107	.01025	.01043	.50747	.02293	1.0119	.00830
Stddev	.06006	.00092	.00022	.03036	.00174	.0138	.00302
%RSD	11.986	8.9874	2.1017	5.9830	7.5700	1.3676	36.380

#1	.44743	.01061	.01018	.47244	.02310	1.0206	.01094
#2	.48981	.00920	.01059	.52386	.02111	.99596	.00895
#3	.56596	.01094	.01052	.52611	.02457	1.0192	.00501

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: LLICV Acquired: 2/28/2017 15:53:28 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10877	.01358	.93012	.51771	.05166	.03482	.21239
Stddev	.00561	.00854	.00544	.00074	.00015	.00433	.00253
%RSD	5.1579	62.878	.58443	.14256	.28981	12.438	1.1898

#1	.11523	.02181	.93054	.51796	.05150	.03514	.20951
#2	.10511	.00476	.92449	.51830	.05180	.03898	.21342
#3	.10598	.01416	.93533	.51688	.05167	.03034	.21424

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.01078	.02196	F 151.58
Stddev	.00044	.00020	1.88
%RSD	4.1138	.89143	1.2432

#1	.01028	.02213	153.34
#2	.01094	.02201	149.59
#3	.01112	.02175	151.82

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5140.5	70908.	8533.2
Stddev	14.1	479.	8.6
%RSD	.27512	.67592	.10070

#1	5145.5	71453.	8529.2
#2	5124.6	70552.	8527.3
#3	5151.5	70720.	8543.0

Approved: March 01, 2017

Ki K Buck

Sample Name: ICSA Acquired: 2/28/2017 15:57:16 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0001	249.63	.00298	.01029	-0.0042	-0.0007	233.45
Stddev	.00212	.32	.00557	.00169	.00074	.00004	.34
%RSD	32593.	.12757	186.81	16.435	174.18	57.987	.14533

#1	-0.00227	249.98	.00218	.01156	-0.00046	-0.00010	233.06
#2	.00031	249.54	.00891	.00837	.00033	-0.00007	233.56
#3	.00194	249.36	-0.00214	.01093	-0.00114	-0.00003	233.71

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0012	-0.0081	-0.00276	.00013	99.211	.05614	.00830
Stddev	.00014	.00048	.00256	.00257	.279	.04385	.00477
%RSD	118.60	58.485	92.877	2044.9	.28161	78.116	57.538

#1	-0.00004	-0.00136	.00012	-0.00128	99.025	.04194	.00723
#2	-0.00028	-0.00050	-0.00362	.00309	99.532	.10533	.01351
#3	-0.00003	-0.00058	-0.00479	-0.00143	99.074	.02115	.00414

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	255.99	-0.00162	-0.00067	.00993	-0.00383	.06472	-0.00004
Stddev	.14	.00081	.00082	.02411	.00197	.01595	.00529
%RSD	.05276	50.095	121.69	242.75	51.403	24.642	14134.

#1	256.15	-0.00112	-0.00101	.00702	-0.00419	.05518	-0.00084
#2	255.89	-0.00255	.00026	-0.01259	-0.00170	.05585	-0.00488
#3	255.94	-0.00118	-0.00127	.03537	-0.00559	.08314	.00561

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: ICSA Acquired: 2/28/2017 15:57:16 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00376	.00001	.01148	.00100	.00120	.00071	-.00460
Stddev	.00887	.00414	.00098	.00085	.00024	.00579	.00290
%RSD	235.90	28985.	8.5480	85.199	19.831	820.97	63.062

#1	.01305	.00100	.01238	.00194	.00148	.00155	-.00787
#2	-.00464	.00357	.01043	.00073	.00106	.00602	-.00360
#3	.00288	-.00453	.01163	.00031	.00107	-.00546	-.00233

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00135	-.00684	F -15.675
Stddev	.00090	.00013	1.055
%RSD	66.611	1.9395	6.7287

#1	.00126	-.00697	-15.592
#2	.00050	-.00670	-14.665
#3	.00229	-.00684	-16.769

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02000
Low Limit			-.02000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4694.8	63972.	8502.8
Stddev	18.1	155.	35.0
%RSD	.38518	.24216	.41124

#1	4686.9	63985.	8539.4
#2	4682.1	63811.	8469.7
#3	4715.5	64120.	8499.2

Approved: March 01, 2017

Ki K Buck

Sample Name: ICSAB Acquired: 2/28/2017 16:01:03 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50313	244.26	.23809	.50437	.24738	.25400	230.92
Stddev	.00437	.11	.00270	.00116	.00063	.00034	.22
%RSD	.86847	.04306	1.1328	.22936	.25309	.13300	.09616

#1	.50649	244.16	.23890	.50404	.24806	.25433	230.82
#2	.50470	244.37	.24029	.50565	.24727	.25366	230.76
#3	.49819	244.25	.23508	.50341	.24682	.25402	231.17

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.45454	.23610	.24197	.24673	97.592	5.2484	.00601
Stddev	.00047	.00086	.00187	.00340	.166	.0533	.00374
%RSD	.10421	.36391	.77101	1.3788	.17044	1.0148	62.193

#1	.45408	.23701	.24087	.24732	97.784	5.3088	.01024
#2	.45502	.23599	.24092	.24979	97.489	5.2082	.00461
#3	.45451	.23530	.24413	.24307	97.502	5.2282	.00317

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	250.86	.24224	.00025	5.1111	.47105	-.01394	.47997
Stddev	.31	.00152	.00075	.0213	.00158	.01038	.00634
%RSD	.12306	.62560	300.28	.41719	.33636	74.502	1.3212

#1	251.04	.24398	.00093	5.0869	.46929	-.02426	.48709
#2	250.50	.24123	-.00055	5.1270	.47238	-.00350	.47791
#3	251.03	.24150	.00037	5.1193	.47147	-.01405	.47492

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: ICSAB Acquired: 2/28/2017 16:01:03 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49117	.23645	.01011	.48265	.00117	.00010	.44185
Stddev	.00921	.00480	.00643	.00125	.00040	.00410	.00448
%RSD	1.8745	2.0281	63.557	.25975	33.895	3961.8	1.0138

#1	.50174	.24013	.01555	.48223	.00084	.00423	.44406
#2	.48688	.23820	.01177	.48166	.00106	.00005	.44480
#3	.48490	.23103	.00302	.48406	.00161	-.00398	.43670

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.24798	.46506	F -15.187
Stddev	.00090	.00041	.324
%RSD	.36335	.08788	2.1329

#1	.24898	.46529	-14.895
#2	.24723	.46458	-15.536
#3	.24772	.46530	-15.131

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.02500
Low Limit			-.02500

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4693.6	64437.	8430.9
Stddev	8.9	135.	18.7
%RSD	.18938	.20905	.22180

#1	4702.2	64299.	8412.3
#2	4684.5	64569.	8430.8
#3	4694.2	64444.	8449.7

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 16:04:45 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.39796	10.227	.40089	.50097	1.0131	.05008	10.110
Stddev	.00274	.031	.00474	.00231	.0029	.00016	.030
%RSD	.68942	.30283	1.1829	.46074	.28522	.31926	.30173

#1	.40059	10.233	.39595	.49839	1.0156	.05015	10.102
#2	.39818	10.194	.40541	.50165	1.0139	.04990	10.143
#3	.39512	10.255	.40131	.50286	1.0100	.05020	10.084

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05020	.20195	.50546	.50514	4.0401	50.659	1.0129
Stddev	.00003	.00015	.00153	.00464	.0167	.118	.0045
%RSD	.05637	.07476	.30362	.91807	.41210	.23329	.44537

#1	.05020	.20205	.50376	.50954	4.0513	50.795	1.0157
#2	.05023	.20202	.50587	.50030	4.0481	50.602	1.0153
#3	.05018	.20178	.50675	.50558	4.0210	50.580	1.0077

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.195	.50362	1.0015	50.268	.50869	9.9447	.50846
Stddev	.156	.00296	.0005	.130	.00038	.0208	.00114
%RSD	1.5325	.58797	.04622	.25807	.07470	.20871	.22439

#1	10.214	.50453	1.0010	50.320	.50899	9.9233	.50978
#2	10.341	.50601	1.0020	50.363	.50826	9.9459	.50775
#3	10.030	.50031	1.0016	50.120	.50882	9.9648	.50786

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 16:04:45 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2054	.40016	5.0191	1.0024	1.0127	1.0027	.51493
Stddev	.0082	.01213	.0143	.0039	.0036	.0077	.00803
%RSD	.67665	3.0315	.28511	.38371	.35882	.76563	1.5598

#1	1.1964	.38732	5.0026	.99930	1.0161	1.0094	.50666
#2	1.2073	.40174	5.0266	1.0067	1.0131	.99430	.52270
#3	1.2124	.41142	5.0280	1.0012	1.0089	1.0044	.51543

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0070	1.0049	F -.04165
Stddev	.0019	.0010	.15252
%RSD	.18968	.09808	366.23

#1	1.0048	1.0040	-.18800
#2	1.0084	1.0048	-.05331
#3	1.0077	1.0059	.11637

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4983.2	68898.	8586.4
Stddev	13.4	275.	25.0
%RSD	.26793	.39900	.29163

#1	4985.6	68586.	8564.8
#2	4968.8	69106.	8613.8
#3	4995.2	69001.	8580.5

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 16:08:21 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00089	-0.00107	-0.00074	.00072	-0.00037	.00006	-0.00128
Stddev	.00089	.00598	.00174	.00101	.00091	.00004	.00338
%RSD	100.29	559.87	236.51	139.66	248.19	56.157	264.04

#1	-0.00066	.00459	-0.00197	.00188	.00068	.00005	-.00427
#2	-0.00188	-0.00047	-0.00150	.00018	-0.00079	.00004	.00238
#3	-0.00014	-0.00733	.00126	.00010	-0.00099	.00011	-.00195

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00036	.00025	-0.00133	.00210	.00443	.08838	-0.00037
Stddev	.00022	.00038	.00086	.00138	.00604	.06381	.00335
%RSD	61.546	149.83	64.548	65.896	136.33	72.200	893.64

#1	-0.00011	.00067	-0.00158	.00279	.01051	.13588	-.00235
#2	-0.00044	-0.00005	-0.00205	.00300	-0.00156	.11340	-.00227
#3	-0.00052	.00013	-0.00038	.00051	.00433	.01585	.00349

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.09951	.00011	.00052	-0.02610	-0.00200	.00424	-0.00054
Stddev	.02155	.00154	.00032	.02120	.00094	.01091	.00334
%RSD	21.656	1373.6	61.189	81.214	46.979	257.40	620.94

#1	-.11166	.00044	.00022	-.02006	-.00217	.00274	-.00148
#2	-.07463	.00146	.00047	-.00858	-.00099	-.00584	-.00331
#3	-.11224	-.00157	.00085	-.04967	-.00284	.01582	.00318

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 16:08:21 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00207	-0.00211	-0.00412	-0.00034	-0.00008	.00074	-0.00205
Stddev	.00454	.00263	.00193	.00072	.00013	.00193	.00585
%RSD	219.24	124.58	46.922	213.61	151.82	260.45	285.48

#1	-0.00579	-0.00015	-0.00592	-0.00108	-0.00007	.00280	-0.00637
#2	-0.00341	-0.00510	-0.00208	-0.00030	-0.00022	.00044	-0.00438
#3	.00299	-0.00108	-0.00436	.00036	.00003	-.00102	.00460

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00042	-0.00063	F 1.1395
Stddev	.00066	.00018	1.2202
%RSD	159.28	28.900	107.08

#1	-0.00007	-0.00046	1.2699
#2	.00117	-0.00082	-.14064
#3	.00015	-0.00060	2.2893

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5127.3	71491.	8703.6
Stddev	11.8	163.	68.9
%RSD	.22987	.22747	.79159

#1	5134.1	71677.	8693.3
#2	5113.7	71377.	8640.4
#3	5134.2	71419.	8777.0

Approved: March 01, 2017

Ki K Buck

Sample Name: PBW 71 Acquired: 2/28/2017 16:29:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00039	.00135	-.00241	.00105	-.00035	.00001	-.00597	-.00030
Stddev	.00084	.00514	.00649	.00135	.00031	.00003	.00467	.00012
%RSD	216.44	379.89	269.65	128.50	89.972	210.97	78.192	39.261

#1	-.00040	.00653	.00419	.00224	.00001	-.00002	-.00159	-.00042
#2	.00127	-.00375	-.00879	.00134	-.00048	.00003	-.00543	-.00020
#3	.00029	.00128	-.00262	-.00042	-.00058	.00003	-.01088	-.00026

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00059	-.00077	.00165	.00879	.10997	-.00222	-.01301	.00050
Stddev	.00025	.00034	.00142	.02106	.08966	.00242	.06267	.00175
%RSD	42.454	44.693	85.709	239.62	81.529	108.98	481.85	352.36

#1	-.00087	-.00040	.00311	.00182	.01977	-.00435	.02901	-.00105
#2	-.00044	-.00082	.00158	-.00790	.19908	.00041	-.08503	.00240
#3	-.00044	-.00108	.00027	.03245	.11108	-.00271	.01700	.00014

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00029	-.02741	.00179	-.00368	-.00395	.00004	.00343	.00304
Stddev	.00084	.03447	.00140	.01033	.00595	.00303	.00264	.00194
%RSD	285.63	125.73	78.032	280.72	150.62	7408.7	77.070	63.932

#1	-.00013	-.06717	.00154	-.01552	-.00790	-.00313	.00594	.00507
#2	.00126	-.00902	.00054	.00349	.00289	.00292	.00368	.00120
#3	-.00025	-.00604	.00330	.00099	-.00683	.00034	.00067	.00286

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: March 01, 2017

Ki K Buck

Sample Name: PBW 71 Acquired: 2/28/2017 16:29:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00024	-0.00018	.00293	-0.00675	.00063	.00115	.53688
Stddev	.00150	.00031	.00101	.00625	.00055	.00024	1.2566
%RSD	615.40	171.76	34.412	92.638	87.690	20.837	234.06

#1	.00029	-0.00049	.00255	-.01126	.00010	.00099	.61306
#2	.00171	-0.00019	.00407	-.00938	.00059	.00143	-.75612
#3	-.00128	.00014	.00216	.00039	.00120	.00103	1.7537

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5029.3	70569.	8447.4
Stddev	2.7	54.	46.5
%RSD	.05394	.07626	.55007

#1	5028.1	70507.	8483.6
#2	5032.4	70606.	8463.6
#3	5027.4	70593.	8395.0

Approved: March 01, 2017

Ki K Buck

Sample Name: LCSW 71 Acquired: 2/28/2017 16:33:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.00000(
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19786	5.1677	.19286	.92755	.50254	.02421	5.0512	.02460
Stddev	.00073	.0268	.00272	.00181	.00155	.00017	.0185	.00039
%RSD	.36955	.51796	1.4112	.19488	.30750	.71098	.36549	1.5941

#1	.19752	5.1540	.19077	.92886	.50421	.02414	5.0536	.02423
#2	.19870	5.1986	.19594	.92829	.50226	.02408	5.0317	.02501
#3	.19736	5.1507	.19188	.92549	.50116	.02440	5.0684	.02456

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10046	.24718	.25185	2.0451	24.996	.50789	5.0286	.25136
Stddev	.00022	.00088	.00074	.0121	.183	.00126	.0395	.00196
%RSD	.22186	.35694	.29550	.58988	.73065	.24728	.78463	.77883

#1	.10023	.24717	.25204	2.0558	25.006	.50688	5.0642	.25103
#2	.10068	.24807	.25247	2.0475	25.173	.50930	4.9862	.24960
#3	.10047	.24631	.25102	2.0320	24.808	.50750	5.0354	.25347

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50183	25.083	.25288	4.7593	.25018	.58693	.19311	2.4647
Stddev	.00085	.021	.00217	.0163	.00371	.00148	.00356	.0047
%RSD	.16920	.08346	.85633	.34206	1.4821	.25239	1.8422	.19154

#1	.50217	25.059	.25451	4.7615	.24670	.58616	.19705	2.4701
#2	.50246	25.092	.25370	4.7743	.25408	.58600	.19217	2.4617
#3	.50087	25.098	.25042	4.7420	.24977	.58864	.19013	2.4623

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: March 01, 2017

Ki K Buck

Sample Name: LCSW 71 Acquired: 2/28/2017 16:33:35 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-03

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49955	.50265	.49076	.25309	.49791	.49063	.84859
Stddev	.00036	.00114	.01072	.00094	.00080	.00107	1.3031
%RSD	.07188	.22772	2.1834	.37263	.15975	.21756	153.56
#1	.49920	.50233	.49213	.25259	.49754	.49178	-.37154
#2	.49953	.50393	.50072	.25418	.49737	.48967	2.2213
#3	.49992	.50171	.47942	.25251	.49883	.49045	.69604

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4970.1	69541.	8567.5
Stddev	12.4	232.	40.1
%RSD	.24911	.33305	.46777
#1	4959.4	69774.	8575.7
#2	4967.3	69537.	8524.0
#3	4983.7	69311.	8602.9

Approved: March 01, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/28/2017 16:37:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604263-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00099	.03599	-0.00034	.00196	-0.00047	-0.00003	-0.00402	-0.00023
Stddev	.00112	.00512	.00171	.00297	.00040	.00002	.01872	.00015
%RSD	113.68	14.223	497.35	151.20	84.828	56.552	466.21	66.716

#1	.00028	.03102	.00155	.00539	-0.00079	-0.00001	-0.00921	-0.00018
#2	-0.00138	.04125	-0.00082	.00027	-0.00002	-0.00004	.01676	-0.00040
#3	-0.00186	.03570	-0.00176	.00023	-0.00059	-0.00005	-0.01959	-0.00010

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00023	.00023	.00213	.00373	.10074	-0.00387	-0.05077	.00173
Stddev	.00012	.00038	.00162	.00537	.06893	.00203	.08980	.00107
%RSD	53.201	161.61	76.279	144.11	68.422	52.362	176.86	62.000

#1	-0.00011	.00065	.00374	.00939	.18032	-0.00616	-.15442	.00079
#2	-0.00022	.00012	.00049	.00308	.06007	-0.00319	.00365	.00150
#3	-0.00035	-.00007	.00215	-.00129	.06182	-0.00228	-.00155	.00290

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00054	.58451	-0.00062	.00185	.00056	-0.00342	-0.00659	.00698
Stddev	.00025	.02176	.00149	.01054	.00496	.00244	.00553	.00040
%RSD	46.653	3.7226	241.06	569.52	891.54	71.497	83.874	5.7129

#1	.00083	.57657	-0.00027	-.01008	-0.00497	-0.00086	-.00522	.00676
#2	.00044	.56783	.00067	.00571	.00465	-0.00366	-.00187	.00674
#3	.00035	.60912	-0.00226	.00992	.00198	-0.00573	-.01267	.00744

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: March 01, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/28/2017 16:37:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604263-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00060	-.00006	.00070	-.00044	.00027	.00307	.75376
Stddev	.00122	.00004	.00102	.00279	.00094	.00012	.58162
%RSD	204.56	68.128	145.85	630.92	351.46	3.9213	77.163

#1	.00152	-.00003	.00136	.00009	.00020	.00296	.16312
#2	.00107	-.00011	.00121	-.00346	-.00063	.00306	1.3259
#3	-.00079	-.00004	-.00048	.00204	.00124	.00320	.77221

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5179.3	72669.	8679.5
Stddev	7.2	341.	37.3
%RSD	.13933	.46935	.43031

#1	5171.0	72722.	8645.1
#2	5182.8	72304.	8674.2
#3	5184.1	72980.	8719.2

Approved: March 01, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/28/2017 16:41:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604265-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00111	.01265	.00174	.00044	-0.00017	-0.00009	.02509	-0.00005
Stddev	.00044	.00039	.00123	.00137	.00011	.00005	.00903	.00026
%RSD	39.474	3.0662	70.296	312.16	62.068	51.626	36.006	513.40

#1	-0.00075	.01232	.00300	.00202	-0.00025	-0.00014	.03107	-0.00018
#2	-0.00099	.01254	.00055	-0.00039	-0.00020	-0.00004	.02950	.00025
#3	-0.00160	.01308	.00169	-0.00031	-0.00005	-0.00009	.01470	-0.00023

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00019	-0.00211	-0.00082	.01064	.11189	-0.00016	.05829	-0.00180
Stddev	.00026	.00073	.00051	.01260	.05386	.00460	.05925	.00191
%RSD	137.56	34.436	61.887	118.47	48.136	2892.4	101.63	106.23

#1	-0.00006	-0.00294	-0.00029	.02464	.04983	-0.00513	.07881	-0.00303
#2	-0.00002	-0.00183	-0.00085	.00706	.14635	.00073	-0.00848	.00040
#3	-0.00049	-0.00157	-0.00130	.00021	.13950	.00393	.10456	-0.00279

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00045	139.50	.00090	-0.00787	-0.00109	.00629	-0.00037	.00717
Stddev	.00018	.35	.00173	.01297	.00419	.00453	.00270	.00425
%RSD	39.759	.25055	191.65	164.81	384.18	72.092	732.37	59.269

#1	.00058	139.57	-0.00042	-0.00576	-0.00592	.01148	-0.00348	.00227
#2	.00025	139.12	.00026	-0.02177	.00126	.00315	.00104	.00988
#3	.00053	139.81	.00286	.00391	.00139	.00423	.00134	.00937

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Approved: March 01, 2017

Ki K Buck

Sample Name: FBLK1 Acquired: 2/28/2017 16:41:07 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604265-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00131	-0.00018	-0.00001	-0.00049	.00037	.00590	.09102
Stddev	.00069	.00013	.00615	.00261	.00026	.00020	.28864
%RSD	52.808	68.962	64430.	535.50	70.865	3.3254	317.11

#1	.00101	-0.00008	.00024	-0.00055	.00029	.00604	-.04387
#2	.00210	-0.00032	-0.00628	-0.00307	.00066	.00598	-.10548
#3	.00082	-0.00014	.00601	.00216	.00015	.00567	.42241

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4949.6	68172.	8609.2
Stddev	6.6	54.	43.8
%RSD	.13307	.07959	.50900

#1	4943.4	68110.	8581.3
#2	4949.0	68210.	8659.7
#3	4956.5	68195.	8586.6

Approved: March 01, 2017

Ki K Buck

Sample Name: FBLK2 Acquired: 2/28/2017 16:44:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604265-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00018	.00266	-.00175	-.00011	-.00042	.00002	.01183	-.00006
Stddev	.00032	.00827	.00314	.00189	.00072	.00004	.00582	.00047
%RSD	173.86	310.99	180.18	1791.0	170.75	257.52	49.161	740.94

#1	.00020	.00773	.00183	-.00131	-.00094	-.00003	.00572	-.00002
#2	.00050	.00712	-.00298	-.00108	-.00072	.00004	.01730	.00039
#3	-.00014	-.00688	-.00409	.00207	.00040	.00005	.01247	-.00056

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00003	-.00135	.00104	.00284	.11359	-.00321	.01584	-.00148
Stddev	.00064	.00075	.00127	.01241	.07318	.00076	.02943	.00109
%RSD	2210.5	55.818	121.67	436.22	64.419	23.620	185.87	73.521

#1	-.00057	-.00055	-.00033	.01466	.10318	-.00401	.02304	-.00078
#2	-.00020	-.00145	.00217	.00395	.19142	-.00312	.04100	-.00273
#3	.00068	-.00205	.00129	-.01008	.04618	-.00250	-.01653	-.00093

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00026	.09408	.00021	-.00939	.00101	-.00238	.00031	.00189
Stddev	.00080	.03197	.00080	.00993	.00699	.00342	.01260	.00179
%RSD	310.27	33.986	383.20	105.75	688.72	143.88	4091.4	94.618

#1	.00066	.08848	-.00060	-.00388	.00086	-.00568	.01484	-.00017
#2	-.00067	.12849	.00022	-.02085	-.00590	.00115	-.00628	.00287
#3	.00078	.06528	.00101	-.00344	.00808	-.00261	-.00763	.00299

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: March 01, 2017

K. K. Buck

Sample Name: FBLK2 Acquired: 2/28/2017 16:44:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604265-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00033	-.00023	.00423	-.00756	.00103	.00276	.23085
Stddev	.00088	.00045	.00428	.00066	.00076	.00017	.24099
%RSD	263.63	195.40	101.25	8.7349	73.217	6.0214	104.40

#1	.00134	.00014	.00069	-.00726	.00117	.00280	.01642
#2	-.00025	-.00072	.00300	-.00832	.00172	.00291	.18446
#3	-.00010	-.00010	.00899	-.00710	.00022	.00258	.49166

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5104.7	72039.	8653.5
Stddev	14.3	417.	31.2
%RSD	.28016	.57818	.36062

#1	5121.2	72226.	8653.0
#2	5096.8	71561.	8622.5
#3	5096.0	72328.	8684.9

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702131901 Acquired: 2/28/2017 16:48:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00028	.13434	.00094	.18697	.03594	-.00001	189.39	.00102
Stddev	.00188	.00936	.00241	.00291	.00037	.00008	.23	.00038
%RSD	668.10	6.9689	255.73	1.5580	1.0246	542.53	.12297	37.533

#1	.00188	.14060	.00332	.18763	.03576	.00000	189.42	.00059
#2	-.00150	.13884	-.00150	.18949	.03637	-.00010	189.61	.00114
#3	-.00123	.12358	.00101	.18378	.03570	.00005	189.15	.00132

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00008	.00023	.05815	.01399	1.1573	.00707	3.2412	.19966
Stddev	.00040	.00049	.00244	.01222	.0277	.00397	.0814	.00425
%RSD	518.40	211.11	4.2015	87.337	2.3888	56.141	2.5102	2.1305

#1	-.00037	.00014	.05747	.02503	1.1261	.00254	3.1808	.19803
#2	.00019	-.00020	.05613	.00087	1.1785	.00992	3.2091	.20449
#3	.00041	.00076	.06087	.01607	1.1675	.00874	3.3337	.19647

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00444	6.6570	.00214	.04743	-.00301	.00306	.00124	1.5418
Stddev	.00045	.0290	.00254	.00492	.00251	.00651	.00636	.0058
%RSD	10.110	.43482	118.91	10.370	83.335	212.99	511.53	.37398

#1	.00477	6.6327	-.00075	.04496	-.00537	-.00444	-.00222	1.5364
#2	.00393	6.6890	.00405	.04424	-.00038	.00730	-.00263	1.5411
#3	.00461	6.6492	.00311	.05310	-.00329	.00631	.00858	1.5479

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702131901 Acquired: 2/28/2017 16:48:46 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00121	.14828	-0.1676	-0.0639	.00161	.01016	.50492
Stddev	.00048	.00022	.00253	.00392	.00081	.00011	.59009
%RSD	39.586	.14752	15.072	61.371	50.018	1.0896	116.87

#1	.00071	.14853	-0.1925	-.00186	.00252	.01016	.72077
#2	.00166	.14812	-0.1420	-.00856	.00133	.01027	-.16270
#3	.00125	.14819	-0.1683	-.00875	.00098	.01005	.95671

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4842.8	67594.	8510.3
Stddev	30.9	346.	54.5
%RSD	.63858	.51116	.64098

#1	4807.2	67907.	8561.8
#2	4858.4	67653.	8453.2
#3	4862.8	67223.	8515.9

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702134702 Acquired: 2/28/2017 16:52:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00030	.14377	.00867	.11601	.02518	-.00000	50.128	-.00005
Stddev	.00112	.00592	.00338	.00366	.00034	.00004	.278	.00002
%RSD	375.45	4.1166	38.964	3.1551	1.3450	1896.0	.55455	51.023

#1	.00028	.14324	.00984	.12020	.02548	-.00003	50.282	-.00006
#2	-.00082	.14994	.01130	.11439	.02526	.00005	49.807	-.00006
#3	.00143	.13813	.00486	.11344	.02481	-.00003	50.296	-.00002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00062	1.2000	.00635	.01484	50.355	.02403	1.8116	.00751
Stddev	.00035	.0033	.00106	.00502	.130	.00206	.0447	.00065
%RSD	56.752	.27345	16.649	33.820	.25783	8.5695	2.4657	8.5890

#1	.00100	1.1963	.00721	.01963	50.441	.02523	1.8584	.00735
#2	.00030	1.2022	.00667	.00962	50.205	.02165	1.7693	.00696
#3	.00056	1.2017	.00517	.01529	50.418	.02521	1.8072	.00822

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.33115	140.75	.00529	.00110	.00454	-.00915	.01026	4.8127
Stddev	.00160	.61	.00167	.00640	.00349	.00478	.00138	.0108
%RSD	.48385	.43084	31.455	582.59	76.697	52.255	13.483	.22415

#1	.32984	140.87	.00591	.00849	.00056	-.01317	.00884	4.8047
#2	.33068	140.09	.00656	-.00281	.00700	-.00386	.01035	4.8084
#3	.33293	141.29	.00341	-.00238	.00608	-.01043	.01160	4.8250

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Approved: March 01, 2017

K. K. Buck

Sample Name: L1702134702 Acquired: 2/28/2017 16:52:34 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-01

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00025	.05296	-0.00036	-0.00617	.00209	.01509	.36323
Stddev	.00102	.00050	.00413	.00254	.00106	.00017	.48351
%RSD	408.31	.94096	1135.5	41.202	50.844	1.1392	133.11

#1	.00082	.05296	.00233	-.00546	.00311	.01490	.75096
#2	.00087	.05247	.00169	-.00405	.00098	.01523	-.17853
#3	-.00093	.05346	-.00512	-.00899	.00219	.01515	.51727

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4948.5	67973.	8636.1
Stddev	3.3	288.	49.4
%RSD	.06722	.42416	.57202

#1	4946.9	68184.	8598.7
#2	4946.3	67645.	8692.1
#3	4952.3	68091.	8617.4

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702134702MS Acquired: 2/28/2017 16:56:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20006	4.9968	.21309	1.0833	.52937	.02526	55.075	.02477
Stddev	.00106	.0029	.00326	.0087	.00064	.00003	.039	.00048
%RSD	.53058	.05706	1.5286	.80700	.12022	.12611	.07164	1.9501

#1	.19939	4.9994	.21504	1.0846	.52865	.02527	55.104	.02531
#2	.20128	4.9937	.20933	1.0739	.52965	.02529	55.030	.02436
#3	.19950	4.9973	.21490	1.0913	.52983	.02523	55.090	.02466

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10028	1.4594	.25495	2.0080	75.579	.52276	6.7738	.25644
Stddev	.00080	.0022	.00058	.0194	.171	.00356	.0823	.00108
%RSD	.80182	.14798	.22776	.96842	.22652	.68172	1.2148	.42276

#1	.10107	1.4569	.25429	1.9999	75.430	.51929	6.8676	.25696
#2	.10030	1.4609	.25520	1.9940	75.540	.52256	6.7141	.25717
#3	.09946	1.4603	.25537	2.0302	75.766	.52641	6.7396	.25520

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.83753	164.72	.25350	4.9998	.25096	.58537	.20828	7.3472
Stddev	.00137	.10	.00105	.0105	.00298	.00522	.00500	.0083
%RSD	.16317	.06324	.41479	.20921	1.1862	.89159	2.4026	.11322

#1	.83804	164.60	.25230	5.0099	.25330	.58084	.20596	7.3424
#2	.83856	164.80	.25423	5.0006	.25198	.59107	.21402	7.3568
#3	.83598	164.76	.25398	4.9890	.24761	.58419	.20485	7.3425

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: March 01, 2017

K. K. Buck

Sample Name: L1702134702MS Acquired: 2/28/2017 16:56:19 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-04

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49839	.55206	.50039	.23991	.50958	.51215	.64957
Stddev	.00317	.00055	.00142	.00510	.00263	.00082	1.4890
%RSD	.63672	.10025	.28317	2.1267	.51702	.15914	229.23
#1	.50144	.55145	.50079	.24223	.51118	.51294	-1.0692
#2	.49862	.55253	.49881	.24344	.51101	.51132	1.5464
#3	.49510	.55219	.50156	.23406	.50654	.51219	1.4715

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4827.1	66578.	8532.4
Stddev	6.3	146.	29.3
%RSD	.13017	.21864	.34360
#1	4833.9	66594.	8561.1
#2	4825.8	66716.	8533.7
#3	4821.6	66426.	8502.5

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702134702MSD Acquired: 2/28/2017 16:59:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19729	4.9937	.20933	1.0796	.52686	.02523	55.018	.02476
Stddev	.00322	.0093	.00363	.0068	.00160	.00014	.174	.00025
%RSD	1.6346	.18712	1.7337	.62870	.30336	.55501	.31578	.99887

#1	.19995	5.0035	.20516	1.0862	.52531	.02524	54.825	.02500
#2	.19822	4.9925	.21178	1.0800	.52850	.02509	55.067	.02476
#3	.19371	4.9850	.21106	1.0727	.52677	.02537	55.162	.02451

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.10038	1.4531	.25263	1.9907	75.493	.52699	6.7284	.25407
Stddev	.00038	.0006	.00191	.0157	.253	.00453	.0888	.00210
%RSD	.38189	.04028	.75502	.79019	.33554	.85896	1.3193	.82483

#1	.10078	1.4534	.25153	2.0038	75.360	.52414	6.6639	.25563
#2	.10036	1.4535	.25153	1.9733	75.785	.53221	6.8297	.25490
#3	.10001	1.4525	.25484	1.9949	75.334	.52462	6.6917	.25169

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.83776	164.89	.25595	4.9861	.24663	.59025	.20303	7.3094
Stddev	.00167	.51	.00292	.0035	.00313	.00395	.01234	.0132
%RSD	.19949	.31134	1.1395	.07104	1.2681	.66930	6.0793	.18029

#1	.83633	164.38	.25898	4.9820	.24701	.58668	.21450	7.3191
#2	.83960	164.89	.25317	4.9882	.24956	.58956	.20463	7.3146
#3	.83736	165.41	.25571	4.9881	.24334	.59449	.18997	7.2944

Check ? **Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass**
 High Limit
 Low Limit

Approved: March 01, 2017

K. K. Buck

Sample Name: L1702134702MSD Acquired: 2/28/2017 16:59:59 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604422-05

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49603	.55241	.49226	.24399	.51121	.51057	1.4398
Stddev	.00166	.00113	.00716	.00189	.00095	.00034	1.5427
%RSD	.33533	.20383	1.4546	.77550	.18505	.06713	107.15
#1	.49413	.55114	.49455	.24324	.51044	.51089	-.31839
#2	.49720	.55329	.49799	.24259	.51094	.51062	2.5673
#3	.49677	.55280	.48423	.24614	.51227	.51021	2.0704

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4825.8	66318.	8458.1
Stddev	4.8	99.	21.4
%RSD	.09887	.14932	.25311
#1	4831.1	66425.	8449.0
#2	4821.9	66230.	8482.6
#3	4824.4	66300.	8442.8

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135201 Acquired: 2/28/2017 17:03:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	.03658	.00602	.77460	.00631	-.00008	41.971
Stddev	.00253	.00813	.00088	.00293	.00051	.00009	.178
%RSD	595.72	22.232	14.654	.37792	8.1023	113.02	.42443

#1	.00184	.04203	.00659	.77538	.00663	-.00005	42.169
#2	-.00250	.02723	.00501	.77706	.00572	-.00019	41.823
#3	.00194	.04047	.00647	.77136	.00658	-.00001	41.920

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00032	-.00004	.07216	.00013	.01974	2.3855	.00604
Stddev	.00016	.00079	.00070	.00318	.01017	.1416	.00163
%RSD	50.254	1978.8	.97698	2475.7	51.511	5.9362	26.977

#1	-.00045	.00018	.07207	.00300	.01199	2.2282	.00718
#2	-.00037	-.00092	.07290	.00068	.03125	2.5029	.00676
#3	-.00014	.00062	.07150	-.00329	.01598	2.4254	.00417

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	21.344	.00055	.01423	F 338.72	.00094	.02458	-.00156
Stddev	.128	.00157	.00066	1.57	.00089	.00345	.00398
%RSD	.60158	283.82	4.6124	.46426	94.238	14.041	254.42

#1	21.489	.00219	.01433	340.52	.00018	.02061	.00274
#2	21.295	.00041	.01483	338.02	.00191	.02678	-.00231
#3	21.247	-.00094	.01353	337.62	.00073	.02637	-.00511

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135201 Acquired: 2/28/2017 17:03:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00648	.01878	.24509	.00094	.55152	.00238	-.00426
Stddev	.00538	.01539	.00149	.00100	.00158	.00642	.00187
%RSD	83.000	81.924	.60688	106.84	.28580	270.06	43.830

#1	.01236	.02649	.24680	-.00006	.55299	.00244	-.00263
#2	.00180	.02880	.24411	.00195	.54986	-.00407	-.00630
#3	.00528	.00106	.24436	.00093	.55171	.00876	-.00386

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00762	.00301	F -.27321
Stddev	.00095	.00014	.62312
%RSD	12.473	4.7881	228.07

#1	.00778	.00302	.04225
#2	.00660	.00316	-.99098
#3	.00848	.00287	.12909

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4754.6	65386.	8420.3
Stddev	19.2	47.	29.8
%RSD	.40382	.07125	.35366

#1	4743.3	65343.	8389.1
#2	4776.8	65379.	8423.3
#3	4743.7	65436.	8448.5

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 17:07:34 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40155	10.222	.40329	.50777	1.0181	.05060	10.178
Stddev	.00283	.008	.00684	.00565	.0040	.00010	.055
%RSD	.70411	.07909	1.6969	1.1136	.38794	.19896	.54193

#1	.39918	10.229	.39821	.50681	1.0165	.05050	10.128
#2	.40468	10.225	.40058	.51384	1.0152	.05062	10.168
#3	.40079	10.213	.41107	.50266	1.0226	.05070	10.237

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05046	.20447	.50941	.51398	4.0807	51.027	1.0229
Stddev	.00024	.00082	.00218	.00183	.0256	.337	.0085
%RSD	.48210	.40325	.42722	.35667	.62806	.66040	.83295

#1	.05025	.20442	.50693	.51267	4.0629	50.939	1.0156
#2	.05073	.20533	.51036	.51320	4.0690	50.744	1.0209
#3	.05041	.20368	.51096	.51608	4.1100	51.400	1.0323

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.260	.50473	1.0136	50.609	.51190	10.104	.51315
Stddev	.143	.00438	.0004	.219	.00096	.022	.00425
%RSD	1.3928	.86864	.04001	.43267	.18780	.21449	.82835

#1	10.303	.50424	1.0131	50.438	.51150	10.104	.51416
#2	10.101	.50061	1.0139	50.534	.51120	10.083	.50849
#3	10.377	.50934	1.0138	50.856	.51300	10.126	.51681

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 17:07:34 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2188	.40645	5.0707	1.0160	1.0180	1.0056	.51623
Stddev	.0073	.01179	.0055	.0030	.0063	.0109	.00968
%RSD	.59924	2.8995	.10861	.29850	.61595	1.0847	1.8748

#1	1.2234	.39345	5.0651	1.0125	1.0129	.99560	.50688
#2	1.2227	.40948	5.0709	1.0179	1.0160	1.0040	.52621
#3	1.2104	.41643	5.0762	1.0176	1.0250	1.0172	.51562

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0119	1.0170	F -.03659
Stddev	.0037	.0023	.34459
%RSD	.37044	.22457	941.86

#1	1.0099	1.0144	-.43448
#2	1.0163	1.0187	.16096
#3	1.0096	1.0177	.16376

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5003.1	69008.	8634.1
Stddev	7.4	483.	42.0
%RSD	.14856	.70019	.48668

#1	5000.3	69545.	8613.2
#2	5011.5	68609.	8682.5
#3	4997.5	68869.	8606.7

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 17:11:09 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00027	-.00127	.00057	.00369	.00010	.00011	.00424
Stddev	.00009	.00457	.00416	.00185	.00077	.00003	.02693
%RSD	33.777	359.01	725.08	50.201	789.84	24.791	634.79

#1	.00034	-.00645	.00535	.00349	-.00002	.00012	.01769
#2	.00017	.00223	-.00226	.00562	.00093	.00008	-.02677
#3	.00029	.00039	-.00138	.00194	-.00061	.00012	.02180

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00010	.00015	-.00185	-.00026	.01802	.16708	-.00103
Stddev	.00036	.00036	.00051	.00085	.01739	.07241	.00218
%RSD	370.15	239.94	27.709	324.90	96.492	43.341	212.62

#1	.00031	.00026	-.00244	-.00079	.02306	.18427	.00102
#2	.00031	-.00025	-.00159	-.00071	-.00133	.22935	-.00078
#3	-.00032	.00044	-.00152	.00072	.03234	.08762	-.00333

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01628	.00000	.00016	.02042	-.00059	.00684	-.00051
Stddev	.04597	.00099	.00050	.02225	.00179	.00934	.00711
%RSD	282.36	49449.	319.58	108.96	305.23	136.62	1408.0

#1	.04104	.00012	-.00033	.02785	-.00266	.01694	-.00648
#2	.04457	-.00105	.00012	-.00459	.00053	-.00149	-.00240
#3	-.03677	.00093	.00067	.03800	.00036	.00507	.00736

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

K. K. Buck

Sample Name: CCB Acquired: 2/28/2017 17:11:09 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00170	-.00620	.00176	-.00078	-.00002	.00233	.00314
Stddev	.00174	.00930	.00471	.00134	.00056	.00149	.00283
%RSD	102.20	149.99	267.01	171.77	3136.0	63.790	90.087

#1	.00025	-.01209	.00702	-.00155	-.00032	.00326	.00091
#2	.00123	-.01103	-.00208	-.00157	.00063	.00062	.00632
#3	.00362	.00452	.00035	.00077	-.00036	.00311	.00219

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00110	-.00077	F .76607
Stddev	.00018	.00013	.66405
%RSD	16.158	17.104	86.683

#1	.00094	-.00064	.24784
#2	.00108	-.00091	.53576
#3	.00129	-.00077	1.5146

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5033.5	70294.	8539.2
Stddev	9.5	198.	37.3
%RSD	.18931	.28166	.43674

#1	5039.8	70457.	8534.1
#2	5038.2	70350.	8504.8
#3	5022.5	70074.	8578.9

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135202 Acquired: 2/28/2017 17:15:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00055	185.15	.06213	6.8899	.08879	F -0.00062	17.764
Stddev	.00225	.26	.00465	.0183	.00051	.00007	.009
%RSD	410.13	.14120	7.4904	.26505	.57840	11.194	.05261

#1	-0.00057	185.45	.06255	6.9082	.08884	-0.00070	17.767
#2	-0.00279	184.99	.05729	6.8899	.08825	-0.00056	17.771
#3	.00171	185.02	.06657	6.8716	.08927	-0.00059	17.753

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit						1.8000	
Low Limit						-0.00050	

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00023	.00090	.78456	.00065	.04163	17.567	.00522
Stddev	.00003	.00058	.00104	.00161	.01055	.134	.00214
%RSD	12.784	63.821	.13284	245.57	25.349	.76516	40.977

#1	.00023	.00054	.78493	.00198	.03051	17.444	.00318
#2	.00027	.00060	.78338	.00112	.04287	17.547	.00504
#3	.00021	.00156	.78536	-.00113	.05150	17.710	.00744

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02442	.00160	.13159	F 1873.7	-.00299	.19562	.00652
Stddev	.05341	.00064	.00125	7.6	.00095	.01174	.00689
%RSD	218.74	39.828	.94713	.40416	31.746	6.0011	105.64

#1	.03077	.00234	.13295	1881.7	-.00268	.20281	.00175
#2	.07436	.00122	.13129	1872.9	-.00223	.20198	.01441
#3	-.03188	.00125	.13052	1866.6	-.00405	.18208	.00339

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135202 Acquired: 2/28/2017 17:15:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01316	.23169	2.8193	-0.0029	.49043	.00134	.00514
Stddev	.00607	.01975	.0037	.00065	.00081	.00368	.00706
%RSD	46.141	8.5238	.13228	225.79	.16453	274.46	137.26

#1	.00648	.20988	2.8226	.00046	.49052	-.00250	.01055
#2	.01833	.24837	2.8199	-.00071	.49119	.00483	-.00284
#3	.01466	.23680	2.8152	-.00062	.48958	.00170	.00772

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.63511	-.00471	F -.77567
Stddev	.00149	.00034	1.6537
%RSD	.23475	7.2113	213.19

#1	.63661	-.00484	-1.4038
#2	.63509	-.00432	-2.0233
#3	.63363	-.00496	1.1001

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4442.5	59235.	8288.1
Stddev	11.5	195.	56.1
%RSD	.25791	.32851	.67732

#1	4429.6	59406.	8335.8
#2	4451.4	59024.	8302.3
#3	4446.6	59277.	8226.2

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135203 Acquired: 2/28/2017 17:18:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00085	136.75	.03985	4.8125	.07049	-0.00046	19.374
Stddev	.00241	.36	.00536	.0194	.00023	.00010	.041
%RSD	282.53	.26514	13.460	.40248	.32867	21.308	.20927

#1	.00072	136.35	.03425	4.8340	.07043	-0.00058	19.378
#2	-0.00362	137.06	.04495	4.8074	.07075	-0.00041	19.412
#3	.00035	136.86	.04035	4.7963	.07030	-0.00041	19.332

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00020	.00099	.67872	.00066	.06329	42.508	.02161
Stddev	.00049	.00052	.00295	.00266	.00356	.246	.00316
%RSD	245.56	52.919	.43469	401.33	5.6311	.57772	14.638

#1	-0.00044	.00073	.67543	-0.00226	.06693	42.225	.01933
#2	-0.00051	.00159	.68114	.00131	.05980	42.628	.02027
#3	.00036	.00064	.67960	.00293	.06314	42.670	.02522

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01378	.00106	.11226	F 1725.6	-0.00098	.10013	.00567
Stddev	.01542	.00060	.00066	24.0	.00073	.00977	.00356
%RSD	111.92	56.934	.58451	1.3885	74.262	9.7566	62.799

#1	.03147	.00145	.11160	1745.4	-0.00181	.08952	.00781
#2	.00672	.00136	.11227	1732.4	-0.00051	.10211	.00156
#3	.00316	.00036	.11291	1698.9	-0.00060	.10876	.00765

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135203 Acquired: 2/28/2017 17:18:53 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01337	.18213	3.9693	.00409	.42528	.00411	.01262
Stddev	.00401	.00668	.0176	.00066	.00093	.00167	.00501
%RSD	29.984	3.6704	.44360	16.014	.21968	40.535	39.715

#1	.01770	.18436	3.9497	.00334	.42421	.00603	.01045
#2	.00978	.17462	3.9745	.00455	.42570	.00325	.01835
#3	.01263	.18742	3.9837	.00438	.42592	.00306	.00905

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.50713	.00001	F -.90649
Stddev	.00136	.00002	.19564
%RSD	.26727	326.86	21.582

#1	.50748	-.00001	-.72867
#2	.50828	.00003	-.87472
#3	.50564	.00001	-1.1161

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4519.6	60200.	8381.7
Stddev	23.1	278.	7.0
%RSD	.51141	.46229	.08401

#1	4493.6	60491.	8375.0
#2	4538.0	59937.	8381.0
#3	4527.1	60172.	8389.0

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135204 Acquired: 2/28/2017 17:22:45 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00084	91.824	.02690	3.7158	.05743	-0.00036	25.609
Stddev	.00166	.322	.00341	.0168	.00108	.00007	.058
%RSD	197.78	.35052	12.689	.45294	1.8815	19.468	.22595

#1	-0.0122	91.522	.02667	3.6974	.05619	-0.00030	25.665
#2	.00098	92.162	.03043	3.7193	.05807	-0.00035	25.613
#3	-0.00227	91.787	.02361	3.7305	.05804	-0.00044	25.550

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00020	.00119	.66569	-0.00081	.02492	67.027	.02497
Stddev	.00042	.00106	.00146	.00173	.01245	.240	.00247
%RSD	207.15	88.645	.21934	213.64	49.954	.35872	9.9022

#1	-0.00068	.00215	.66437	-0.00081	.01286	66.753	.02213
#2	-0.00002	.00137	.66726	.00092	.03772	67.122	.02660
#3	.00010	.00006	.66546	-0.00254	.02419	67.205	.02619

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00829	-0.00071	.10444	F 1567.1	-0.00258	.03712	.00382
Stddev	.04598	.00072	.00037	21.1	.00098	.00954	.00232
%RSD	554.66	100.82	.35606	1.3479	38.102	25.707	60.763

#1	.04336	-0.00074	.10409	1579.8	-0.00171	.04616	.00115
#2	-.04474	-.00142	.10483	1542.7	-.00365	.02714	.00491
#3	-.02349	.00002	.10441	1578.8	-.00239	.03807	.00539

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135204 Acquired: 2/28/2017 17:22:45 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00542	.15984	4.6624	.00008	.42117	.00459	.00833
Stddev	.00686	.00907	.0169	.00178	.00051	.00285	.00615
%RSD	126.53	5.6772	.36233	2165.3	.12066	62.126	73.803

#1	-.00082	.16968	4.6763	.00192	.42084	.00666	.00462
#2	.00432	.15802	4.6673	-.00163	.42175	.00134	.01542
#3	.01276	.15181	4.6436	-.00005	.42091	.00579	.00494

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.40961	-.00143	F -1.4404
Stddev	.00071	.00018	.6085
%RSD	.17243	12.844	42.241

#1	.40893	-.00162	-1.2786
#2	.41034	-.00125	-.92927
#3	.40955	-.00142	-2.1135

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4507.3	60672.	8440.7
Stddev	11.3	427.	27.0
%RSD	.25059	.70303	.32030

#1	4517.4	61063.	8457.7
#2	4509.5	60737.	8454.9
#3	4495.1	60217.	8409.5

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135205 Acquired: 2/28/2017 17:26:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00023	.11372	.00323	.24741	.01141	-.00002	102.11
Stddev	.00205	.00213	.00428	.00306	.00025	.00001	.18
%RSD	879.07	1.8757	132.34	1.2367	2.2144	70.310	.17259

#1	.00046	.11129	.00817	.24689	.01167	-.00002	102.28
#2	.00138	.11526	.00093	.25070	.01140	-.00004	102.12
#3	-.00254	.11462	.00060	.24464	.01117	-.00001	101.93

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00013	.00015	.07396	.00286	.00854	10.706	.00798
Stddev	.00039	.00047	.00086	.00091	.01277	.021	.00160
%RSD	306.47	313.51	1.1586	31.685	149.45	.19429	19.991

#1	.00014	-.00023	.07423	.00315	.01885	10.698	.00982
#2	.00005	.00000	.07465	.00359	-.00574	10.691	.00692
#3	-.00057	.00067	.07300	.00185	.01253	10.730	.00721

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.06363	-.00015	.01196	220.88	-.00132	-.00439	-.00253
Stddev	.06304	.00087	.00009	.04	.00010	.00861	.00439
%RSD	99.079	571.68	.73829	.01950	7.7198	196.02	173.39

#1	.12237	.00078	.01204	220.92	-.00127	.00443	-.00153
#2	.07148	-.00029	.01186	220.83	-.00125	-.00484	-.00734
#3	-.00297	-.00094	.01199	220.90	-.00144	-.01278	.00127

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135205 Acquired: 2/28/2017 17:26:38 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00611	.01497	1.0183	.00129	.50291	-.00793	.00047
Stddev	.00402	.01759	.0010	.00047	.00269	.00416	.00422
%RSD	65.792	117.56	.09720	36.836	.53421	52.456	893.82

#1	.00598	.03448	1.0189	.00074	.50408	-.00997	.00457
#2	.00215	.01011	1.0188	.00160	.49984	-.00314	.00070
#3	.01019	.00031	1.0172	.00152	.50482	-.01066	-.00386

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.01302	.00217	F -.50548
Stddev	.00041	.00017	.82817
%RSD	3.1715	7.7072	163.84

#1	.01254	.00236	-1.3766
#2	.01329	.00207	.27169
#3	.01322	.00208	-.41150

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4816.4	66037.	8388.3
Stddev	28.3	275.	20.6
%RSD	.58683	.41629	.24541

#1	4784.1	66336.	8368.1
#2	4828.5	65980.	8387.6
#3	4836.6	65796.	8409.2

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135206 Acquired: 2/28/2017 17:30:26 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00093	65.947	.01209	2.6984	.05934	-.00028	43.639
Stddev	.00107	.162	.00391	.0077	.00034	.00008	.146
%RSD	114.92	.24575	32.342	.28530	.57298	28.337	.33548

#1	.00182	66.042	.00760	2.6899	.05965	-.00027	43.804
#2	.00124	66.038	.01475	2.7050	.05940	-.00037	43.524
#3	-.00026	65.759	.01392	2.7002	.05898	-.00021	43.589

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00001	.00044	.58478	.00118	.01305	86.500	.03211
Stddev	.00011	.00023	.00172	.00150	.01442	.137	.00156
%RSD	2127.7	50.676	.29434	127.17	110.45	.15849	4.8652

#1	.00011	.00025	.58596	.00086	.00445	86.407	.03042
#2	-.00011	.00069	.58557	.00281	.02970	86.435	.03243
#3	.00001	.00039	.58280	-.00013	.00502	86.657	.03350

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00070	-.00241	.09619	F 1393.4	-.00030	.02813	-.00216
Stddev	.04117	.00084	.00107	22.0	.00121	.01114	.00667
%RSD	5895.9	34.822	1.1089	1.5819	401.22	39.601	308.65

#1	.04806	-.00144	.09606	1387.0	.00107	.03039	-.00986
#2	-.02646	-.00291	.09731	1375.3	-.00076	.03797	.00197
#3	-.01951	-.00289	.09519	1418.0	-.00122	.01603	.00140

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135206 Acquired: 2/28/2017 17:30:26 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00549	.12964	3.3520	.00014	.49690	.00195	-.00040
Stddev	.00484	.01253	.0096	.00143	.00081	.00030	.00393
%RSD	88.175	9.6622	.28671	992.40	.16260	15.424	970.71

#1	.00136	.12623	3.3414	.00151	.49737	.00223	.00254
#2	.00430	.14353	3.3602	.00026	.49736	.00198	-.00487
#3	.01082	.11918	3.3543	-.00134	.49597	.00163	.00111

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.23610	-.00060	F -.79357
Stddev	.00062	.00015	1.0829
%RSD	.26429	25.045	136.46

#1	.23681	-.00075	.08404
#2	.23566	-.00045	-2.0038
#3	.23583	-.00061	-.46100

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4570.8	61264.	8388.5
Stddev	43.9	270.	43.3
%RSD	.95960	.44060	.51568

#1	4527.1	61576.	8432.2
#2	4570.5	61100.	8387.7
#3	4614.8	61117.	8345.7

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135207 Acquired: 2/28/2017 17:34:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00116	14.452	.00451	1.0448	.07023	-.00017	69.270
Stddev	.00238	.027	.00207	.0016	.00072	.00007	.074
%RSD	205.12	.18876	46.025	.15561	1.0209	38.614	.10719

#1	.00113	14.480	.00557	1.0463	.06950	-.00025	69.352
#2	.00355	14.449	.00583	1.0430	.07027	-.00015	69.251
#3	-.00120	14.426	.00212	1.0449	.07093	-.00012	69.208

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.00066	.00079	.51983	.00035	.01873	98.151	.04085
Stddev	.00043	.00018	.00030	.00250	.00947	.234	.00123
%RSD	65.223	22.404	.05682	724.95	50.583	.23851	2.9999

#1	-.00116	.00062	.51949	-.00222	.02535	98.218	.04180
#2	-.00039	.00077	.52005	.00048	.02296	97.890	.04128
#3	-.00044	.00097	.51993	.00278	.00788	98.343	.03947

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	4.5000						
Low Limit	-.00050						

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05039	.00160	.08588	F 1205.8	-.00034	.00641	.00289
Stddev	.13577	.00047	.00079	14.8	.00181	.00357	.00357
%RSD	269.41	29.404	.92333	1.2283	532.01	55.686	123.65

#1	-.07306	.00212	.08678	1190.5	-.00184	.00915	-.00086
#2	.02845	.00121	.08531	1220.0	-.00086	.00771	.00625
#3	.19580	.00146	.08553	1206.9	.00167	.00237	.00327

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135207 Acquired: 2/28/2017 17:34:18 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00902	.08768	9.6404	.00008	.58318	-.00361	-.00175
Stddev	.00697	.00563	.0162	.00076	.00109	.00405	.00609
%RSD	77.222	6.4244	.16846	974.42	.18727	112.36	347.83

#1	.00728	.08339	9.6307	.00047	.58442	.00105	-.00195
#2	.01670	.08560	9.6592	-.00080	.58238	-.00634	.00444
#3	.00309	.09406	9.6314	.00056	.58274	-.00553	-.00774

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.13307	.00231	.57626
Stddev	.00205	.00012	1.2717
%RSD	1.5385	5.1095	220.68

#1	.13504	.00217	-.17806
#2	.13095	.00238	-.13769
#3	.13322	.00237	2.0445

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4688.4	63035.	8605.5
Stddev	.9	116.	16.5
%RSD	.01879	.18329	.19146

#1	4688.5	63127.	8587.5
#2	4689.2	62905.	8609.4
#3	4687.4	63072.	8619.7

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135208 Acquired: 2/28/2017 17:38:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00184	.39032	.00566	.03949	.09027	-0.00010	149.03
Stddev	.00087	.00223	.00232	.00245	.00060	.00003	.13
%RSD	47.367	.57134	41.040	6.2170	.65988	24.473	.09020

#1	-0.00281	.39239	.00620	.03682	.09086	-0.00011	148.90
#2	-0.00161	.39062	.00766	.04000	.08967	-0.00008	149.04
#3	-0.00111	.38796	.00311	.04165	.09029	-0.00013	149.16

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00001	.00102	.47119	.00112	.00440	130.06	.10707
Stddev	.00012	.00075	.00242	.00157	.01293	.30	.00310
%RSD	1090.6	73.597	.51364	139.90	293.95	.22963	2.8947

#1	.00001	.00171	.47263	.00096	.00713	130.29	.10882
#2	-0.00014	.00113	.47254	-0.00036	-0.00968	129.72	.10891
#3	.00009	.00022	.46839	.00276	.01574	130.16	.10350

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.01917	.00068	.08152	F 1012.7	-0.00010	.00165	-.00416
Stddev	.07057	.00175	.00019	7.8	.00154	.01478	.00492
%RSD	368.10	256.09	.23078	.77122	1559.6	896.31	118.29

#1	-0.05274	-0.00092	.08159	1013.4	.00130	-0.00528	-.00647
#2	.06192	.00256	.08130	1004.5	-0.00176	-0.00840	.00149
#3	-0.06670	.00041	.08165	1020.1	.00017	.01862	-.00751

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135208 Acquired: 2/28/2017 17:38:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00052	.03133	5.7453	.00025	1.3354	-0.01370	-0.00107
Stddev	.00625	.00832	.0178	.00026	.0019	.00103	.00486
%RSD	1208.9	26.566	.31028	106.16	.14139	7.4901	455.76

#1	-.00663	.02431	5.7506	.00023	1.3373	-.01386	-.00443
#2	.00322	.04053	5.7598	.00051	1.3335	-.01464	.00451
#3	.00496	.02917	5.7254	-.00001	1.3355	-.01261	-.00328

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.01777	.00805	F -.50562
Stddev	.00058	.00025	.83701
%RSD	3.2836	3.1272	165.54

#1	.01719	.00799	-.79940
#2	.01835	.00783	-1.1561
#3	.01776	.00833	.43867

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4602.8	62709.	8524.3
Stddev	6.3	144.	38.6
%RSD	.13609	.22945	.45338

#1	4603.9	62857.	8551.7
#2	4608.4	62570.	8541.1
#3	4596.0	62701.	8480.1

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135209 Acquired: 2/28/2017 17:42:05 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00108	.09740	.00166	.04056	.10663	-.00008	176.75
Stddev	.00079	.00663	.00374	.00078	.00028	.00010	.62
%RSD	73.315	6.8031	224.97	1.9282	.25920	123.92	.35068

#1	-.00150	.10174	-.00092	.04140	.10632	-.00015	177.39
#2	-.00017	.10068	.00594	.03986	.10671	-.00013	176.15
#3	-.00158	.08977	-.00004	.04040	.10686	.00003	176.70

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00004	.00034	.51528	.00283	.00630	159.32	.12044
Stddev	.00044	.00032	.00023	.00193	.01459	.69	.00115
%RSD	1022.2	95.880	.04559	68.414	231.80	.43082	.95269

#1	.00038	.00046	.51506	.00477	.00683	159.60	.12176
#2	.00021	-.00003	.51525	.00091	-.00856	158.53	.11972
#3	-.00046	.00057	.51553	.00279	.02061	159.81	.11983

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01334	-.00114	.07757	F 878.49	-.00108	-.00297	-.00104
Stddev	.03270	.00287	.00081	.77	.00028	.00655	.00164
%RSD	245.11	252.08	1.0444	.08747	25.532	220.55	157.36

#1	.02473	.00067	.07685	877.76	-.00139	.00216	-.00089
#2	.03882	.00036	.07741	879.29	-.00086	-.00072	-.00276
#3	-.02353	-.00445	.07844	878.41	-.00099	-.01036	.00052

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135209 Acquired: 2/28/2017 17:42:05 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00138	.03137	3.7317	.00096	1.4583	-.01420	-.00303
Stddev	.00497	.00019	.0044	.00123	.0027	.00410	.00234
%RSD	360.34	.59222	.11791	128.55	.18512	28.877	77.142

#1	.00163	.03120	3.7279	-.00018	1.4614	-.01840	-.00569
#2	-.00371	.03157	3.7306	.00227	1.4565	-.01020	-.00206
#3	.00622	.03133	3.7365	.00078	1.4571	-.01401	-.00133

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.01218	.00750	F -.53483
Stddev	.00050	.00011	.28261
%RSD	4.1036	1.5013	52.842

#1	.01276	.00748	-.27625
#2	.01186	.00762	-.83652
#3	.01193	.00739	-.49171

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4582.9	62709.	8392.0
Stddev	8.5	184.	86.4
%RSD	.18599	.29327	1.0300

#1	4591.2	62628.	8359.0
#2	4574.2	62919.	8490.1
#3	4583.3	62579.	8327.0

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135210 Acquired: 2/28/2017 17:46:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00019	.58748	.00313	.32587	.01286	-.00001	51.520
Stddev	.00129	.00718	.00155	.00094	.00060	.00005	.241
%RSD	692.53	1.2215	49.589	.28841	4.6615	1028.2	.46854

#1	-.00127	.58516	.00185	.32585	.01335	-.00006	51.530
#2	.00115	.58175	.00269	.32683	.01305	.00005	51.274
#3	.00068	.59553	.00486	.32495	.01219	-.00001	51.756

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	.00423	.30536	.00186	.06527	16.403	.03827
Stddev	.00018	.00045	.00110	.00121	.01237	.058	.00456
%RSD	186.79	10.588	.36180	65.058	18.947	.35364	11.914

#1	.00028	.00443	.30531	.00314	.06113	16.347	.03318
#2	.00007	.00372	.30428	.00172	.05551	16.400	.04197
#3	-.00007	.00455	.30649	.00073	.07918	16.463	.03967

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	19.510	.00920	.02798	F 273.82	.00077	.01332	.00364
Stddev	.246	.00147	.00159	4.03	.00138	.01306	.00247
%RSD	1.2589	15.978	5.6801	1.4700	180.30	98.080	67.719

#1	19.415	.00945	.02969	272.18	.00236	.02667	.00090
#2	19.326	.01053	.02654	270.88	.00009	.01270	.00434
#3	19.789	.00762	.02772	278.41	-.00015	.00058	.00569

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135210 Acquired: 2/28/2017 17:46:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00327	.03141	8.9437	.00017	.71188	.00429	-.00735
Stddev	.00245	.01129	.0313	.00059	.00251	.00185	.00857
%RSD	74.808	35.932	.34961	352.98	.35295	43.029	116.55

#1	.00476	.03554	8.9776	.00084	.71383	.00639	.00174
#2	.00045	.04006	8.9160	-.00006	.70905	.00357	-.01527
#3	.00460	.01864	8.9376	-.00028	.71277	.00292	-.00853

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.03810	.00393	F -.59062
Stddev	.00028	.00016	.63143
%RSD	.73075	4.1052	106.91

#1	.03816	.00375	-1.1902
#2	.03779	.00399	-.65005
#3	.03834	.00405	.06842

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4872.6	66924.	8499.1
Stddev	7.3	51.	52.8
%RSD	.14936	.07676	.62123

#1	4864.2	66892.	8492.7
#2	4877.0	66983.	8554.8
#3	4876.7	66897.	8449.8

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135211 Acquired: 2/28/2017 17:49:54 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00185	3.7929	.08061	1.1200	.06292	F -0.00123	60.371
Stddev	.00157	.0131	.00499	.0024	.00089	.00004	.179
%RSD	84.965	.34613	6.1887	.21191	1.4081	3.0243	.29627

#1	-0.00158	3.7931	.07880	1.1209	.06301	-0.00119	60.289
#2	-0.00353	3.7796	.08625	1.1218	.06199	-0.00122	60.249
#3	-0.00042	3.8059	.07678	1.1173	.06376	-0.00127	60.577

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit						1.8000	
Low Limit						-0.00050	

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00004	.00187	2.2806	.00214	-0.00550	148.64	.22946
Stddev	.00022	.00047	.0085	.00065	.01771	.42	.00324
%RSD	563.83	25.132	.37232	30.624	322.10	.28266	1.4135

#1	.00011	.00142	2.2878	.00284	-.00896	148.56	.23032
#2	.00021	.00185	2.2826	.00203	.01369	148.27	.22587
#3	-.00021	.00236	2.2712	.00154	-.02122	149.10	.23218

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.96454	-0.00117	.24236	F 1567.4	.00074	.04919	-0.00001
Stddev	.04181	.00286	.00012	8.7	.00141	.00563	.00075
%RSD	4.3342	244.37	.04981	.55463	191.97	11.452	13317.

#1	.94256	.00099	.24246	1574.8	.00179	.05568	.00078
#2	1.0128	-.00441	.24223	1569.5	.00130	.04566	-.00071
#3	.93831	-.00009	.24240	1557.8	-.00087	.04622	-.00009

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-0.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135211 Acquired: 2/28/2017 17:49:54 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00697	.18580	2.3648	-.00034	.90186	.00020	.02724
Stddev	.00182	.00651	.0031	.00084	.00126	.00307	.00636
%RSD	26.077	3.5038	.13236	247.72	.13939	1527.8	23.334

#1	-.00647	.18275	2.3677	-.00068	.90073	-.00122	.03371
#2	-.00545	.19328	2.3615	.00062	.90162	-.00190	.02700
#3	-.00898	.18138	2.3653	-.00095	.90321	.00372	.02100

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.3968	.00853	.07309
Stddev	.0002	.00018	.95524
%RSD	.01276	2.1486	1307.0

#1	1.3970	.00834	1.1672
#2	1.3967	.00855	-.59488
#3	1.3967	.00870	-.35310

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4533.0	61345.	8664.7
Stddev	33.1	149.	42.8
%RSD	.73085	.24277	.49408

#1	4563.6	61414.	8646.1
#2	4537.6	61174.	8713.6
#3	4497.8	61446.	8634.3

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 17:53:49 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40444	10.347	.40649	.51537	1.0304	.05112	10.249
Stddev	.00026	.029	.00496	.00473	.0015	.00022	.027
%RSD	.06410	.28366	1.2195	.91683	.14342	.42988	.26300

#1	.40419	10.375	.40169	.51615	1.0289	.05136	10.217
#2	.40471	10.349	.40619	.51965	1.0319	.05092	10.265
#3	.40443	10.316	.41159	.51030	1.0305	.05109	10.263

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05043	.20374	.51162	.51333	4.0604	51.992	1.0431
Stddev	.00058	.00032	.00095	.00352	.0312	.227	.0053
%RSD	1.1525	.15641	.18637	.68655	.76826	.43667	.50761

#1	.05053	.20395	.51052	.51640	4.0501	51.730	1.0439
#2	.04981	.20337	.51225	.50948	4.0954	52.128	1.0374
#3	.05096	.20389	.51209	.51412	4.0356	52.118	1.0479

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.149	.50725	1.0116	51.366	.51455	10.139	.51653
Stddev	.012	.00346	.0008	.100	.00055	.029	.00510
%RSD	.11332	.68151	.07481	.19510	.10643	.28736	.98735

#1	10.146	.50344	1.0116	51.480	.51451	10.154	.52196
#2	10.139	.51019	1.0108	51.293	.51511	10.157	.51185
#3	10.162	.50812	1.0123	51.324	.51402	10.105	.51577

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 17:53:49 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Ti1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2287	.40232	5.1011	1.0183	1.0269	1.0015	.52053
Stddev	.0052	.00252	.0039	.0017	.0021	.0052	.00659
%RSD	.42208	.62552	.07634	.16849	.20617	.51965	1.2653

#1	1.2337	.40130	5.1017	1.0202	1.0247	.99900	.52244
#2	1.2233	.40519	5.1047	1.0178	1.0289	1.0074	.51320
#3	1.2290	.40048	5.0970	1.0168	1.0273	.99795	.52596

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0178	1.0160	F 1.1726
Stddev	.0035	.0003	.1981
%RSD	.33948	.02881	16.893

#1	1.0194	1.0162	1.1808
#2	1.0139	1.0157	.97052
#3	1.0203	1.0162	1.3664

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5002.7	69083.	8537.7
Stddev	20.0	283.	36.0
%RSD	.39898	.40967	.42210

#1	5025.5	69181.	8570.0
#2	4994.4	69303.	8544.4
#3	4988.2	68763.	8498.8

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 17:57:25 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00049	-0.00372	.00285	.00720	-0.00052	.00006	-0.02193
Stddev	.00092	.00488	.00292	.00092	.00052	.00007	.01970
%RSD	188.76	131.24	102.60	12.751	99.478	118.85	89.858

#1	-0.00007	-0.00327	.00456	.00653	-0.00033	.00010	-0.04466
#2	.00015	.00092	.00451	.00824	-0.00012	-0.00002	-0.00969
#3	-0.00154	-0.00880	-0.00053	.00682	-0.00110	.00011	-0.01144

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -0.00059	.00011	-0.00092	.00051	.00019	.35074	-0.00223
Stddev	.00042	.00033	.00048	.00315	.00351	.08064	.00145
%RSD	71.717	311.33	51.801	622.18	1892.8	22.991	65.242

#1	-0.00106	-0.00027	-0.00146	.00404	.00364	.26907	-0.00177
#2	-0.00043	.00024	-0.00054	-0.00198	.00029	.43031	-0.00386
#3	-0.00027	.00035	-0.00077	-0.00055	-0.00337	.35283	-0.00106

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	.00050						
Low Limit	-0.00050						

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02139	.00003	.00026	.34477	.00062	-0.00054	-0.00331
Stddev	.04398	.00376	.00087	.04167	.00271	.00601	.00501
%RSD	205.64	13380.	334.60	12.085	437.27	1121.7	151.66

#1	-0.01648	-0.00432	.00124	.37102	-0.00097	.00550	.00244
#2	.06962	.00211	-0.00043	.29673	.00375	-0.00058	-0.00554
#3	.01102	.00229	-0.00002	.36657	-0.00092	-0.00652	-0.00682

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 17:57:25 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00020	.00511	-.00077	-.00086	.00002	.00028	.00411
Stddev	.00022	.01486	.00258	.00129	.00023	.00165	.00333
%RSD	107.23	291.08	336.50	150.55	972.57	593.29	81.215

#1	-.00001	-.00375	.00048	.00029	-.00019	-.00161	.00704
#2	.00019	.02226	.00095	-.00225	-.00002	.00143	.00048
#3	.00043	-.00320	-.00374	-.00061	.00028	.00102	.00481

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00027	-.00064	F .89286
Stddev	.00087	.00035	.55575
%RSD	320.84	54.512	62.244

#1	-.00070	-.00028	1.4505
#2	.00097	-.00066	.88907
#3	.00054	-.00098	.33901

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5069.6	71120.	8442.0
Stddev	16.6	104.	14.7
%RSD	.32805	.14646	.17387

#1	5059.7	71013.	8450.5
#2	5060.3	71222.	8425.1
#3	5088.8	71126.	8450.5

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135212 Acquired: 2/28/2017 18:01:16 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00136	.00692	.01665	.57939	.03541	-0.00013	59.630
Stddev	.00054	.00295	.00535	.00239	.00042	.00007	.205
%RSD	39.615	42.660	32.131	.41243	1.1810	57.334	.34437

#1	-0.00075	.01030	.02157	.57664	.03503	-0.00009	59.809
#2	-0.00176	.00486	.01095	.58099	.03534	-0.00021	59.406
#3	-0.00157	.00559	.01743	.58054	.03586	-0.00008	59.675

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00036	.00062	.01075	.00032	.01403	.86241	.01079
Stddev	.00004	.00060	.00198	.00069	.00520	.06289	.00228
%RSD	11.991	97.449	18.400	219.02	37.070	7.2924	21.120

#1	.00041	.00017	.00941	.00111	.01748	.84423	.01317
#2	.00033	.00039	.00983	-0.00000	.00805	.93238	.01058
#3	.00036	.00130	.01303	-0.00016	.01655	.81061	.00863

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	14.791	-0.00208	.00893	F 390.01	.00416	.12596	.00086
Stddev	.069	.00076	.00054	2.26	.00197	.00544	.00141
%RSD	.46686	36.419	5.9984	.57869	47.305	4.3173	165.32

#1	14.790	-0.00290	.00926	392.23	.00263	.12066	.00169
#2	14.722	-0.00191	.00923	390.07	.00638	.13153	-0.00078
#3	14.860	-0.00142	.00832	387.72	.00346	.12570	.00165

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

K. K. Buck

Sample Name: L1702135212 Acquired: 2/28/2017 18:01:16 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00511	.02533	6.3312	.00059	.89336	.00032	.00093
Stddev	.00595	.00859	.0079	.00111	.00188	.00271	.00160
%RSD	116.47	33.915	.12457	186.65	.21011	853.51	171.53

#1	.00880	.02705	6.3361	.00069	.89428	.00280	.00174
#2	-.00175	.01601	6.3354	.00165	.89120	.00072	.00198
#3	.00828	.03293	6.3221	-.00056	.89460	-.00257	-.00091

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.09817	.00348	F -.55588
Stddev	.00066	.00018	.47528
%RSD	.67688	5.2032	85.500

#1	.09741	.00328	-.03739
#2	.09847	.00352	-.65934
#3	.09863	.00363	-.97091

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4790.9	65998.	8562.6
Stddev	7.6	96.	46.7
%RSD	.15773	.14556	.54526

#1	4797.8	66101.	8549.3
#2	4782.8	65981.	8614.5
#3	4792.1	65911.	8524.0

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135212PS Acquired: 2/28/2017 18:05:09 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604474-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19714	4.7066	.21669	1.4722	.52848	.02493	58.823
Stddev	.00212	.0133	.00248	.0051	.00049	.00004	.165
%RSD	1.0740	.28278	1.1458	.34626	.09353	.15907	.28094

#1	.19958	4.7141	.21436	1.4776	.52866	.02494	58.900
#2	.19602	4.7145	.21930	1.4675	.52887	.02497	58.633
#3	.19581	4.6912	.21641	1.4715	.52793	.02489	58.935

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02446	.09802	.25579	.24517	1.9382	26.805	.51770
Stddev	.00019	.00024	.00102	.00115	.0052	.105	.00066
%RSD	.76935	.24580	.39964	.46823	.26774	.39347	.12747

#1	.02428	.09800	.25677	.24489	1.9411	26.684	.51813
#2	.02466	.09778	.25473	.24644	1.9322	26.849	.51803
#3	.02443	.09827	.25585	.24419	1.9412	26.881	.51694

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	18.239	.24275	.50395	F 377.97	.24767	5.0976	.23303
Stddev	.022	.00222	.00089	1.03	.00246	.0183	.00463
%RSD	.12332	.91339	.17746	.27226	.99313	.35951	1.9860

#1	18.217	.24474	.50496	376.79	.24874	5.1115	.23221
#2	18.239	.24036	.50359	378.69	.24941	5.0768	.22886
#3	18.262	.24316	.50329	378.43	.24485	5.1046	.23801

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135212PS Acquired: 2/28/2017 18:05:09 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604474-01

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.58884	.22227	8.1660	.48417	1.3015	.48597	.23321
Stddev	.00296	.00865	.0083	.00102	.0018	.00090	.00435
%RSD	.50346	3.8939	.10190	.21110	.14115	.18444	1.8633

#1	.58664	.22054	8.1725	.48400	1.3001	.48518	.22833
#2	.58768	.23166	8.1566	.48526	1.3009	.48695	.23468
#3	.59221	.21461	8.1690	.48323	1.3036	.48578	.23664

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.58872	.49286	.09397
Stddev	.00083	.00075	1.2034
%RSD	.14085	.15169	1280.6

#1	.58862	.49365	-8.1645
#2	.58794	.49216	1.4583
#3	.58959	.49276	-3.5995

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4763.8	65890.	8371.1
Stddev	8.1	63.	80.5
%RSD	.17034	.09546	.96193

#1	4758.6	65922.	8326.4
#2	4773.2	65930.	8464.0
#3	4759.6	65817.	8322.8

Approved: March 01, 2017

K. K. Buck

Sample Name: L1702135212SDL Acquired: 2/28/2017 18:09:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604474-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00044	-0.00065	.00388	.12116	.00647	-0.00004	11.731	-0.00036
Stddev	.00048	.00611	.00098	.00125	.00028	.00004	.018	.00020
%RSD	108.63	936.50	25.145	1.0343	4.3569	110.81	.15166	55.117

#1	.00010	-.00659	.00499	.12260	.00656	-.00008	11.750	-.00035
#2	-.00061	.00562	.00351	.12047	.00670	-.00000	11.729	-.00017
#3	-.00081	-.00099	.00315	.12040	.00615	-.00002	11.714	-.00057

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00009	.00073	.00088	.00363	.36816	.00362	2.8646	-0.0141
Stddev	.00034	.00113	.00111	.01347	.07288	.00143	.0269	.00207
%RSD	378.61	153.31	125.98	371.06	19.796	39.595	.93877	147.43

#1	-.00048	-.00024	.00083	-.01192	.44840	.00517	2.8338	-.00126
#2	.00005	.00047	-.00020	.01154	.30607	.00235	2.8836	.00059
#3	.00015	.00197	.00201	.01127	.34999	.00333	2.8763	-.00355

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00213	80.738	.00022	.03525	-0.00098	.00470	.00469	1.2477
Stddev	.00075	.303	.00105	.01115	.00583	.01290	.00395	.0089
%RSD	35.366	.37483	469.36	31.630	592.48	274.39	84.280	.71679

#1	.00257	80.678	.00139	.04401	.00430	.00657	.00879	1.2373
#2	.00126	81.065	-.00065	.02270	-.00723	.01656	.00438	1.2525
#3	.00256	80.469	-.00006	.03904	-.00002	-.00903	.00090	1.2531

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135212SDL Acquired: 2/28/2017 18:09:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604474-02

Elem	Sn1899	Sr4077	Ti3372	Ti1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00134	.17339	.00271	.00380	.01971	.00068	.31314
Stddev	.00083	.00058	.00356	.00800	.00155	.00018	1.3799
%RSD	61.722	.33276	130.96	210.64	7.8527	25.595	440.67

#1	.00052	.17390	-.00132	.01009	.02049	.00050	.98940
#2	.00133	.17351	.00405	.00651	.02071	.00085	-1.2744
#3	.00218	.17276	.00541	-.00520	.01793	.00070	1.2245

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	5050.0	70923.	8622.3
Stddev	8.9	239.	69.7
%RSD	.17595	.33683	.80840

#1	5053.9	71189.	8672.0
#2	5056.2	70729.	8542.6
#3	5039.8	70850.	8652.3

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135213 Acquired: 2/28/2017 18:12:48 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00136	191.58	.04104	4.7000	.54746	-0.00039	28.983
Stddev	.00176	.52	.00118	.0153	.00178	.00005	.126
%RSD	129.49	.26947	2.8788	.32575	.32503	12.248	.43505

#1	-0.00026	192.07	.03983	4.7065	.54809	-0.00037	29.075
#2	-0.00042	191.63	.04109	4.7111	.54883	-0.00036	29.034
#3	-0.00338	191.04	.04220	4.6826	.54545	-0.00045	28.839

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00014	.00143	.52163	.00022	.07444	4.9191	.04271
Stddev	.00016	.00026	.00133	.00094	.01188	.1638	.00217
%RSD	116.39	17.803	.25558	424.03	15.961	3.3302	5.0895

#1	-0.00000	.00114	.52273	-0.00082	.08486	4.7309	.04288
#2	.00011	.00161	.52203	.00048	.06150	4.9974	.04479
#3	.00032	.00155	.52015	.00101	.07695	5.0291	.04046

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.03544	-0.00057	.09312	F 2048.1	-0.00138	.11385	.00483
Stddev	.06868	.00029	.00065	20.8	.00131	.00848	.00208
%RSD	193.79	50.640	.69451	1.0175	94.479	7.4457	43.195

#1	.01467	-0.00072	.09315	2062.7	-0.00266	.12354	.00348
#2	-0.00726	-0.00024	.09375	2057.3	-0.00004	.11024	.00723
#3	-.11374	-0.00074	.09245	2024.2	-0.00145	.10778	.00377

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702135213 Acquired: 2/28/2017 18:12:48 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00847	.26207	3.8013	.00361	1.3402	.00192	.00578
Stddev	.00729	.00276	.0030	.00211	.0032	.00381	.00401
%RSD	86.111	1.0514	.07818	58.493	.23680	198.56	69.367

#1	.01330	.26061	3.7984	.00310	1.3421	-.00248	.00732
#2	.00008	.26525	3.8044	.00594	1.3420	.00396	.00123
#3	.01202	.26035	3.8011	.00181	1.3366	.00428	.00879

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.44918	-.00038	F -1.4225
Stddev	.00206	.00034	.2359
%RSD	.45926	87.601	16.582

#1	.45005	-.00015	-1.1788
#2	.44682	-.00023	-1.6496
#3	.45066	-.00077	-1.4392

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4401.2	58846.	8108.5
Stddev	3.1	334.	6.3
%RSD	.06947	.56686	.07759

#1	4404.7	58490.	8104.3
#2	4399.6	58896.	8105.6
#3	4399.2	59151.	8115.7

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702136701 Acquired: 2/28/2017 18:16:41 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00063	.01589	-.00006	.03621	.23694	.00006	244.01
Stddev	.00142	.00392	.00202	.00190	.00146	.00004	.28
%RSD	227.71	24.692	3557.8	5.2375	.61699	66.517	.11348

#1	-.00226	.01196	.00214	.03402	.23789	.00002	244.01
#2	.00006	.01589	-.00182	.03743	.23526	.00006	243.73
#3	.00033	.01981	-.00050	.03717	.23767	.00010	244.28

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	.00056	-.00135	.00961	-.00302	286.70	.04748
Stddev	.00036	.00028	.00024	.00064	.00802	1.47	.00197
%RSD	82.633	50.618	17.569	6.6997	265.53	.51393	4.1586

#1	.00077	.00061	-.00155	.00989	-.00709	288.38	.04845
#2	.00047	.00025	-.00109	.00887	.00622	285.66	.04879
#3	.00006	.00082	-.00143	.01006	-.00818	286.05	.04521

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.09303	-.00066	.00510	261.15	-.00080	.04796	.04443
Stddev	.10544	.00096	.00056	.72	.00016	.00849	.00602
%RSD	113.35	144.67	10.952	.27718	19.403	17.694	13.544

#1	.02487	.00039	.00450	260.75	-.00067	.05628	.03992
#2	-.12563	-.00149	.00561	260.72	-.00098	.04827	.04211
#3	-.17831	-.00088	.00519	261.98	-.00076	.03932	.05127

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702136701 Acquired: 2/28/2017 18:16:41 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00555	.01260	.08165	.00270	.26955	-.01775	-.00758
Stddev	.00271	.01363	.00337	.00044	.00053	.00128	.00428
%RSD	48.729	108.20	4.1220	16.212	.19585	7.2375	56.451

#1	.00577	.02394	.07902	.00317	.26919	-.01923	-.00497
#2	.00814	-.00252	.08050	.00263	.26932	-.01691	-.00525
#3	.00274	.01637	.08544	.00231	.27016	-.01711	-.01252

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00100	.77379	F -.36752
Stddev	.00093	.00168	.52137
%RSD	93.707	.21728	141.86

#1	.00052	.77572	-.25714
#2	.00207	.77304	.08982
#3	.00040	.77262	-.93523

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4599.4	64266.	8220.3
Stddev	2.2	201.	80.3
%RSD	.04718	.31285	.97702

#1	4599.4	64127.	8135.0
#2	4601.6	64497.	8294.4
#3	4597.3	64176.	8231.6

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702136801 Acquired: 2/28/2017 18:20:27 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00236	.02565	.00117	.01599	.39795	-0.00004	F 427.47
Stddev	.00218	.00653	.00133	.00068	.00045	.00008	1.69
%RSD	92.138	25.455	114.35	4.2560	.11360	206.30	.39453

#1	-0.00486	.02682	.00113	.01537	.39839	-0.00008	429.12
#2	-0.00090	.03151	.00252	.01588	.39749	.00005	427.55
#3	-0.00133	.01861	-0.00015	.01672	.39797	-0.00008	425.75

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00030	.00027	-0.00078	.01208	.01416	245.43	.05532
Stddev	.00051	.00032	.00070	.00016	.00459	.46	.00463
%RSD	169.06	120.48	89.710	1.3395	32.408	.18723	8.3633

#1	.00016	.00048	-0.00145	.01192	.01479	245.80	.05005
#2	.00088	-0.00010	-0.00083	.01224	.00929	244.91	.05872
#3	-0.00012	.00043	-0.00006	.01209	.01840	245.58	.05719

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01414	-0.00087	.01197	266.18	-0.00023	.04313	.00979
Stddev	.07528	.00111	.00036	1.33	.00033	.00449	.00377
%RSD	532.54	128.09	2.9871	.50082	146.77	10.408	38.516

#1	-0.04154	.00008	.01209	267.45	.00014	.04742	.01296
#2	-0.01583	-0.00059	.01224	266.30	-0.00051	.04351	.01080
#3	.09978	-0.00209	.01156	264.79	-0.00031	.03847	.00562

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702136801 Acquired: 2/28/2017 18:20:27 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00225	.01426	.22544	.00126	.49037	F -.03187	-.00798
Stddev	.01073	.00760	.01145	.00125	.00055	.00118	.00336
%RSD	476.56	53.303	5.0785	99.576	.11237	3.6954	42.066

#1	-.01014	.01272	.23741	.00130	.49097	-.03318	-.00943
#2	.00823	.02251	.22432	-.00002	.49026	-.03089	-.01036
#3	.00866	.00755	.21459	.00249	.48989	-.03154	-.00414

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit						36.000	
Low Limit						-.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-.00025	.02196	F -.81889
Stddev	.00032	.00032	.79250
%RSD	130.72	1.4716	96.777

#1	-.00061	.02177	-1.1060
#2	-.00016	.02233	-1.4279
#3	.00002	.02177	.07714

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4525.0	63736.	8218.6
Stddev	16.0	175.	28.2
%RSD	.35279	.27416	.34368

#1	4537.1	63833.	8192.0
#2	4506.9	63842.	8248.3
#3	4531.1	63535.	8215.6

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 18:24:18 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40075	10.315	.40217	.50326	1.0237	.05085	10.185
Stddev	.00091	.032	.00420	.00225	.0016	.00023	.068
%RSD	.22673	.30571	1.0454	.44766	.15432	.45171	.66722

#1	.40067	10.351	.40678	.50076	1.0247	.05104	10.258
#2	.39988	10.292	.39854	.50512	1.0246	.05093	10.170
#3	.40169	10.302	.40120	.50392	1.0219	.05060	10.125

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05053	.20342	.51058	.51232	3.9815	52.588	1.0473
Stddev	.00038	.00111	.00041	.00200	.0289	.104	.0071
%RSD	.75714	.54508	.08013	.39028	.72619	.19828	.67737

#1	.05034	.20391	.51079	.51075	3.9497	52.587	1.0549
#2	.05029	.20420	.51084	.51163	4.0062	52.693	1.0409
#3	.05098	.20215	.51011	.51457	3.9884	52.484	1.0461

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.9513	.49933	1.0094	51.254	.50809	10.077	.51653
Stddev	.0339	.00183	.0024	.253	.00224	.009	.00468
%RSD	.34089	.36657	.24014	.49394	.44112	.08668	.90641

#1	9.9380	.50123	1.0077	51.522	.50776	10.085	.52069
#2	9.9260	.49758	1.0122	51.218	.50603	10.068	.51146
#3	9.9899	.49918	1.0084	51.020	.51048	10.080	.51742

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 18:24:18 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2375	.40364	5.0850	1.0059	1.0232	.99612	.50339
Stddev	.0124	.01250	.0046	.0007	.0022	.00828	.00331
%RSD	1.0042	3.0962	.09100	.06939	.21184	.83154	.65676

#1	1.2506	.41698	5.0814	1.0066	1.0257	.98781	.50687
#2	1.2259	.40177	5.0833	1.0053	1.0226	1.0044	.50302
#3	1.2361	.39219	5.0902	1.0058	1.0215	.99617	.50028

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0120	1.0038	F .63936
Stddev	.0027	.0006	.53317
%RSD	.26268	.05620	83.390

#1	1.0091	1.0033	.29177
#2	1.0144	1.0038	.37310
#3	1.0123	1.0044	1.2532

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			-10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4908.0	68900.	8320.0
Stddev	1.6	92.	40.2
%RSD	.03203	.13397	.48314

#1	4906.2	68942.	8288.9
#2	4908.8	68794.	8305.8
#3	4909.0	68964.	8365.4

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 18:27:55 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00044	-.01176	.00118	.00135	.00058	.00004	.00478
Stddev	.00031	.00862	.00318	.00219	.00057	.00004	.00680
%RSD	71.267	73.247	268.90	161.84	98.297	117.08	142.26

#1	-.00036	-.01826	-.00100	.00350	.00003	.00001	.00575
#2	-.00079	-.01504	.00482	-.00088	.00054	.00002	.01104
#3	-.00017	-.00199	-.00028	.00145	.00117	.00009	-.00245

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00011	.00007	-.00237	.00238	-.00201	.38234	.00103
Stddev	.00027	.00042	.00141	.00049	.00859	.04676	.00316
%RSD	236.35	637.14	59.569	20.648	427.92	12.230	308.11

#1	.00002	-.00040	-.00278	.00265	-.00130	.40396	.00218
#2	-.00042	.00041	-.00080	.00181	.00621	.41439	-.00255
#3	.00006	.00019	-.00352	.00268	-.01093	.32868	.00345

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00938	-.00050	.00032	.21520	.00105	.00258	F -.00628
Stddev	.13747	.00020	.00040	.03081	.00195	.00297	.00122
%RSD	1464.9	39.207	124.47	14.317	185.36	115.16	19.464

#1	.02259	-.00065	.00077	.21500	.00118	.00031	-.00714
#2	-.16003	-.00028	.00017	.18448	.00293	.00594	-.00488
#3	.10928	-.00058	.00001	.24610	-.00096	.00148	-.00681

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							.00500
Low Limit							-.00500

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 18:27:55 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00726	-.00561	.00027	-.00038	-.00015	.00729	.00128
Stddev	.00288	.00683	.00086	.00123	.00021	.00235	.00580
%RSD	39.718	121.78	316.00	321.34	141.22	32.206	453.84

#1	.00678	-.00034	.00112	-.00148	.00008	.00802	.00786
#2	.01035	-.01333	-.00060	.00094	-.00032	.00466	-.00308
#3	.00464	-.00315	.00029	-.00060	-.00020	.00918	-.00095

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00064	-.00079	F .81780
Stddev	.00041	.00027	1.6758
%RSD	64.609	34.302	204.92

#1	.00078	-.00069	-.79730
#2	.00096	-.00109	.70228
#3	.00017	-.00058	2.5484

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4972.6	70837.	8274.6
Stddev	6.1	275.	27.0
%RSD	.12324	.38813	.32571

#1	4965.7	71069.	8305.7
#2	4977.2	70533.	8257.8
#3	4974.9	70909.	8260.3

Approved: March 01, 2017

Ki K Buck

Sample Name: PBW A3 Acquired: 2/28/2017 18:31:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00026	-0.01274	-0.00032	.00216	.00094	.00010	-0.01087
Stddev	.00135	.00747	.00587	.00206	.00024	.00005	.01563
%RSD	516.57	58.608	1815.1	95.226	25.279	45.071	143.79

#1	-0.00038	-0.00992	-0.00557	.00004	.00073	.00005	.00380
#2	-0.00155	-0.02121	-0.00141	.00415	.00120	.00013	-.02732
#3	.00114	-0.00710	.00601	.00229	.00089	.00013	-0.00909

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00009	-0.00002	-0.00176	.00058	-0.00607	.35592	-0.00293
Stddev	.00010	.00067	.00088	.00238	.00459	.03918	.00608
%RSD	110.73	2999.6	50.254	410.93	75.624	11.007	207.64

#1	.00008	.00045	-0.00202	-0.00005	-0.00330	.39512	.00359
#2	.00020	-0.00079	-0.00248	.00321	-0.00354	.35588	-0.00843
#3	-0.00000	.00027	-0.00077	-0.00142	-0.01137	.31677	-0.00394

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00505	-0.00087	.00092	.20646	.00076	-0.00291	-0.00280
Stddev	.03322	.00215	.00096	.02950	.00119	.01232	.00622
%RSD	658.31	246.37	104.31	14.287	155.61	423.99	221.84

#1	.01708	-0.00260	-0.00017	.22233	.00055	-0.01315	.00346
#2	.01102	.00154	.00166	.22463	-0.00031	.01076	-0.00290
#3	-.04325	-0.00156	.00128	.17243	.00205	-0.00633	-0.00897

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: PBW A3 Acquired: 2/28/2017 18:31:49 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-02

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00514	-.00281	-.00006	.00039	-.00008	.00140	-.00304
Stddev	.00821	.00612	.00417	.00110	.00026	.00263	.00589
%RSD	159.68	217.53	7041.2	280.93	338.56	187.55	193.66

#1	.00856	-.00309	-.00124	.00088	-.00011	.00398	-.00882
#2	-.00423	-.00879	.00457	-.00087	-.00033	-.00128	.00295
#3	.01108	.00344	-.00351	.00116	.00020	.00150	-.00326

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-.00038	.00032	F -.71137
Stddev	.00057	.00016	.20135
%RSD	149.15	50.229	28.305

#1	-.00103	.00014	-.90707
#2	-.00001	.00044	-.50481
#3	-.00010	.00037	-.72222

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4972.7	71644.	8250.2
Stddev	15.6	277.	24.7
%RSD	.31443	.38703	.29979

#1	4989.3	71893.	8277.9
#2	4970.7	71694.	8242.4
#3	4958.2	71345.	8230.3

Approved: March 01, 2017

Ki K Buck

Sample Name: LCSW A3 Acquired: 2/28/2017 18:35:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19573	5.0659	.19240	.90567	.50227	.02435	4.9882
Stddev	.00072	.0013	.00348	.00280	.00100	.00002	.0106
%RSD	.36666	.02484	1.8072	.30958	.19874	.06554	.21236

#1	.19645	5.0662	.19234	.90323	.50188	.02434	4.9794
#2	.19501	5.0645	.18896	.90873	.50341	.02435	4.9853
#3	.19573	5.0670	.19591	.90506	.50153	.02437	5.0000

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02423	.10063	.24681	.25021	1.9544	25.610	.51610
Stddev	.00021	.00035	.00032	.00171	.0219	.096	.00186
%RSD	.88620	.34400	.12781	.68433	1.1205	.37630	.36065

#1	.02403	.10099	.24666	.24830	1.9791	25.514	.51460
#2	.02419	.10030	.24717	.25071	1.9468	25.707	.51551
#3	.02446	.10060	.24660	.25161	1.9373	25.610	.51818

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.8605	.24604	.49594	25.110	.24919	4.7662	.25049
Stddev	.0974	.00120	.00174	.045	.00090	.0124	.00384
%RSD	2.0042	.48761	.35106	.17970	.36168	.26069	1.5344

#1	4.8754	.24690	.49397	25.152	.24936	4.7519	.24606
#2	4.7565	.24655	.49724	25.116	.24822	4.7723	.25248
#3	4.9496	.24467	.49662	25.062	.25000	4.7745	.25294

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: LCSW A3 Acquired: 2/28/2017 18:35:39 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-03

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.59892	.18942	2.4772	.49244	.50090	.48675	.24149
Stddev	.00618	.00866	.0093	.00236	.00042	.00102	.00146
%RSD	1.0315	4.5695	.37568	.47864	.08441	.20874	.60267

#1	.59695	.18463	2.4664	.49011	.50043	.48600	.24297
#2	.60585	.19941	2.4830	.49482	.50125	.48790	.24006
#3	.59398	.18422	2.4821	.49240	.50103	.48634	.24144

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.49110	.47896	F -.08812
Stddev	.00171	.00121	.69060
%RSD	.34831	.25255	783.72

#1	.48968	.47784	.54119
#2	.49300	.47880	.02139
#3	.49062	.48024	-.82693

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4907.7	69659.	8249.9
Stddev	14.5	118.	54.5
%RSD	.29486	.16884	.66003

#1	4891.0	69793.	8312.4
#2	4914.8	69615.	8212.8
#3	4917.2	69571.	8224.4

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120101 Acquired: 2/28/2017 18:39:22 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00094	.03864	.00256	.14476	.18418	.00005	69.876
Stddev	.00137	.00054	.00493	.00261	.00098	.00006	.078
%RSD	145.14	1.4010	192.56	1.8052	.53417	117.61	.11204

#1	.00054	.03920	-.00301	.14177	.18441	.00009	69.965
#2	-.00122	.03812	.00635	.14659	.18310	-.00002	69.845
#3	-.00215	.03861	.00434	.14593	.18503	.00007	69.818

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00002	.00785	.00527	.00353	.25685	6.8923	.02478
Stddev	.00046	.00074	.00014	.00078	.01108	.2075	.00271
%RSD	1857.3	9.4770	2.6265	22.029	4.3152	3.0102	10.926

#1	.00049	.00859	.00511	.00438	.25517	6.6939	.02551
#2	.00002	.00710	.00535	.00286	.24671	6.8752	.02705
#3	-.00043	.00785	.00535	.00335	.26868	7.1078	.02178

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.9792	.14242	.00681	F 1790.3	.02199	4.0794	-.00139
Stddev	.0179	.00189	.00035	35.9	.00039	.0180	.00292
%RSD	.17888	1.3259	5.1973	2.0061	1.7901	.44064	210.40

#1	9.9654	.14159	.00683	1823.2	.02232	4.0906	-.00332
#2	9.9994	.14458	.00716	1752.0	.02211	4.0889	.00197
#3	9.9729	.14108	.00645	1795.7	.02155	4.0587	-.00282

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120101 Acquired: 2/28/2017 18:39:22 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01358	-0.00389	3.5321	.00016	3.6731	-0.00202	-0.00709
Stddev	.00392	.01479	.0117	.00176	.0117	.00277	.00585
%RSD	28.858	380.50	.33160	1073.6	.31816	136.71	82.594

#1	.01579	.00059	3.5198	.00082	3.6842	.00113	-0.00444
#2	.01590	-.02039	3.5432	-.00183	3.6609	-.00317	-0.00302
#3	.00906	.00815	3.5332	.00150	3.6743	-.00403	-0.01380

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00116	.07326	F -1.6544
Stddev	.00152	.00022	.8788
%RSD	130.87	.30197	53.117

#1	.00164	.07304	-2.5482
#2	-.00054	.07325	-.79145
#3	.00238	.07348	-1.6236

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4313.4	58762.	8194.1
Stddev	19.5	401.	100.8
%RSD	.45116	.68251	1.2302

#1	4333.3	58797.	8131.5
#2	4312.4	59145.	8310.4
#3	4294.4	58345.	8140.5

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301 Acquired: 2/28/2017 18:43:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00177	.14676	.00489	.14260	.28726	.00008	102.28
Stddev	.00058	.00380	.00270	.00125	.00128	.00009	.37
%RSD	32.515	2.5896	55.132	.87793	.44605	104.75	.36336

#1	-.00209	.14484	.00688	.14338	.28848	.00017	102.63
#2	-.00111	.14430	.00182	.14326	.28593	-.00000	101.89
#3	-.00212	.15114	.00597	.14115	.28736	.00008	102.32

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00099	.01137	.00755	.00835	3.0251	6.5849	.02194
Stddev	.00016	.00005	.00052	.00245	.0213	.0781	.00501
%RSD	16.015	.46503	6.8981	29.374	.70257	1.1868	22.840

#1	.00093	.01140	.00752	.00586	3.0028	6.5082	.02769
#2	.00116	.01139	.00809	.00844	3.0451	6.5821	.01961
#3	.00086	.01130	.00705	.01076	3.0273	6.6645	.01852

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	24.581	.54855	.00591	F 1672.4	.02974	1.9732	-.00311
Stddev	.015	.00442	.00074	26.6	.00168	.0066	.00319
%RSD	.05981	.80634	12.500	1.5905	5.6391	.33284	102.78

#1	24.596	.55303	.00562	1697.3	.02781	1.9707	-.00222
#2	24.580	.54418	.00536	1644.4	.03068	1.9683	-.00665
#3	24.566	.54845	.00675	1675.5	.03074	1.9807	-.00045

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301 Acquired: 2/28/2017 18:43:17 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00361	.00205	6.1943	.00083	4.0477	-.00338	-.00663
Stddev	.00550	.00802	.0114	.00022	.0163	.00265	.00403
%RSD	152.25	391.59	.18359	27.205	.40157	78.354	60.770

#1	.00968	-.00631	6.1852	.00059	4.0552	-.00264	-.00996
#2	-.00103	.00276	6.1907	.00086	4.0291	-.00118	-.00776
#3	.00218	.00969	6.2071	.00103	4.0590	-.00633	-.00215

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00135	.30848	F -2.5471
Stddev	.00100	.00050	.7053
%RSD	73.763	.16255	27.689

#1	.00223	.30792	-2.1041
#2	.00157	.30890	-3.3604
#3	.00027	.30862	-2.1768

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4303.5	58507.	8075.8
Stddev	9.8	157.	45.3
%RSD	.22813	.26879	.56091

#1	4299.1	58564.	8032.8
#2	4314.7	58628.	8123.1
#3	4296.6	58329.	8071.5

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301PS Acquired: 2/28/2017 18:47:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604140-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20741	4.4777	.20500	1.0754	.75486	.02618	97.102
Stddev	.00153	.0196	.00569	.0019	.00140	.00001	.049
%RSD	.73713	.43706	2.7740	.17940	.18489	.04720	.05027

#1	.20860	4.4900	.20131	1.0735	.75339	.02618	97.046
#2	.20795	4.4551	.20214	1.0753	.75616	.02617	97.135
#3	.20569	4.4879	.21155	1.0774	.75502	.02619	97.125

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02539	.10571	.25789	.24749	4.6196	34.152	.55603
Stddev	.00043	.00093	.00055	.00201	.0444	.250	.00363
%RSD	1.6994	.88430	.21426	.81370	.96037	.73345	.65237

#1	.02579	.10602	.25795	.24953	4.5725	33.865	.55885
#2	.02545	.10645	.25731	.24743	4.6256	34.325	.55730
#3	.02493	.10466	.25841	.24551	4.6606	34.266	.55194

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	27.027	.73203	.49659	F 1586.6	.26244	6.9566	.22912
Stddev	.070	.00349	.00163	11.9	.00278	.0570	.00035
%RSD	.25986	.47707	.32845	.75240	1.0586	.81946	.15148

#1	27.076	.72880	.49709	1575.3	.26456	6.9496	.22880
#2	27.058	.73156	.49792	1585.4	.26348	7.0168	.22907
#3	26.947	.73574	.49477	1599.1	.25930	6.9034	.22948

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301PS Acquired: 2/28/2017 18:47:11 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604140-03

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.61035	.18859	8.0468	.47325	4.1403	.48113	.21027
Stddev	.00159	.00363	.0580	.00278	.0065	.00968	.00095
%RSD	.26072	1.9233	.72143	.58806	.15583	2.0121	.44970

#1	.60995	.18926	8.0610	.47264	4.1363	.48709	.21048
#2	.61210	.18468	8.0964	.47629	4.1478	.48634	.20923
#3	.60900	.19184	7.9830	.47083	4.1369	.46996	.21109

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.51019	.76093	F -1.4366
Stddev	.00080	.00449	.7250
%RSD	.15739	.59053	50.470

#1	.51111	.76258	-.60338
#2	.50965	.76437	-1.9240
#3	.50980	.75585	-1.7823

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4299.0	58541.	8019.4
Stddev	13.5	218.	34.6
%RSD	.31511	.37255	.43127

#1	4312.5	58656.	8052.1
#2	4285.4	58678.	8022.7
#3	4299.1	58290.	7983.2

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301SDL Acquired: 2/28/2017 18:51:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604140-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00324	.02774	.00016	.03023	.05719	.00008	20.698
Stddev	.00147	.00114	.00603	.00212	.00028	.00004	.061
%RSD	45.287	4.0983	3836.9	6.9984	.48879	51.497	.29233

#1	-.00169	.02644	.00127	.03174	.05717	.00012	20.766
#2	-.00461	.02818	-.00635	.03115	.05692	.00007	20.678
#3	-.00341	.02858	.00555	.02781	.05748	.00004	20.650

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00034	.00224	-.00034	.00299	.61360	1.6585	.00430
Stddev	.00037	.00014	.00052	.00134	.01921	.0640	.00140
%RSD	109.16	6.0602	149.80	44.728	3.1302	3.8616	32.558

#1	-.00040	.00228	-.00092	.00445	.59179	1.6426	.00580
#2	.00006	.00209	-.00018	.00269	.62796	1.6039	.00302
#3	-.00067	.00236	.00007	.00183	.62106	1.7290	.00410

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.9314	.10976	.00205	F 449.20	.00572	.38980	-.00160
Stddev	.0771	.00188	.00032	4.45	.00092	.00033	.00351
%RSD	1.5638	1.7123	15.702	.99050	16.038	.08531	220.19

#1	4.9780	.11106	.00169	452.13	.00605	.39008	-.00162
#2	4.8424	.11061	.00229	444.08	.00643	.38990	-.00510
#3	4.9739	.10760	.00219	451.39	.00468	.38943	.00193

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				270.00			
Low Limit				-.50000			

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702120301SDL Acquired: 2/28/2017 18:51:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 5 Custom ID2: Custom ID3:
 Comment: WG604140-04

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00905	-0.00914	1.2221	.00030	.79780	-0.00112	.00030
Stddev	.00248	.00934	.0045	.00082	.00072	.00192	.00029
%RSD	27.394	102.19	.36728	274.39	.09021	171.68	99.352

#1	.01079	-0.00249	1.2229	-.00041	.79714	.00053	.00059
#2	.00621	-0.01983	1.2262	.00119	.79856	-.00066	.00001
#3	.01014	-0.00511	1.2173	.00011	.79769	-.00323	.00029

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00003	.06125	F -1.5455
Stddev	.00098	.00040	1.4309
%RSD	2854.6	.64837	92.587

#1	.00021	.06148	-1.9975
#2	.00080	.06148	-2.6959
#3	-.00112	.06079	.05684

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4769.0	65845.	8287.5
Stddev	7.7	161.	49.9
%RSD	.16153	.24423	.60191

#1	4774.7	65935.	8232.6
#2	4760.3	65659.	8330.1
#3	4772.1	65940.	8299.7

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702125304 Acquired: 2/28/2017 18:54:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 10 Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00014	-0.00253	.00362	.00675	1.5745	-0.00003	F 327.38
Stddev	.00098	.00159	.00544	.00114	.0040	.00005	.37
%RSD	711.12	62.714	150.43	16.822	.25517	195.87	.11361

#1	.00021	-.00411	.00787	.00806	1.5701	.00003	327.27
#2	-.00088	-.00094	-.00251	.00600	1.5781	-.00003	327.80
#3	.00108	-.00254	.00549	.00620	1.5751	-.00007	327.08

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00052	.00135	-0.00249	.00472	2.4375	22.233	.08161
Stddev	.00052	.00014	.00066	.00170	.0121	.166	.00167
%RSD	100.19	10.593	26.385	36.119	.49606	.74631	2.0502

#1	.00085	.00135	-.00236	.00668	2.4257	22.057	.07976
#2	.00079	.00149	-.00320	.00364	2.4369	22.254	.08203
#3	-.00008	.00120	-.00190	.00383	2.4499	22.387	.08303

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.9853	.51833	.00064	11.515	.01056	.01798	.00075
Stddev	.0996	.00258	.00040	.030	.00108	.00716	.00073
%RSD	1.4261	.49800	61.924	.26237	10.247	39.821	97.459

#1	7.0673	.51548	.00043	11.519	.00947	.01263	.00094
#2	6.8744	.51901	.00040	11.543	.01056	.02612	-.00006
#3	7.0142	.52050	.00110	11.483	.01164	.01520	.00138

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702125304 Acquired: 2/28/2017 18:54:56 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 10 Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00506	-.00148	.30082	.00102	1.4405	-.02019	-.00025
Stddev	.00159	.00444	.00047	.00059	.0029	.00391	.00662
%RSD	31.514	299.42	.15500	57.217	.20196	19.390	2610.6

#1	.00456	.00237	.30109	.00169	1.4372	-.02187	-.00522
#2	.00377	-.00048	.30028	.00081	1.4428	-.01571	.00727
#3	.00684	-.00634	.30108	.00057	1.4413	-.02298	-.00281

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00052	.00172	F -.73320
Stddev	.00092	.00010	.84752
%RSD	177.28	5.8223	115.59

#1	.00158	.00167	-.77073
#2	.00006	.00183	-1.5613
#3	-.00008	.00165	.13246

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4897.7	69839.	8629.8
Stddev	14.8	200.	66.9
%RSD	.30178	.28642	.77471

#1	4913.4	69995.	8696.7
#2	4895.7	69908.	8629.8
#3	4884.1	69613.	8562.9

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702125306 Acquired: 2/28/2017 18:58:43 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 10 Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0125	.01758	.00084	.00573	.29461	.00002	F 290.33
Stddev	.00060	.00277	.00541	.00364	.00092	.00006	1.16
%RSD	48.337	15.760	641.58	63.451	.31375	274.51	.39885

#1	-0.0194	.01988	-0.0100	.00532	.29431	.00004	290.50
#2	-0.0101	.01834	.00694	.00956	.29565	-.00005	291.39
#3	-0.0080	.01450	-0.0341	.00232	.29388	.00007	289.09

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-.10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00025	.00038	-0.00063	.00580	.00363	19.100	.08858
Stddev	.00012	.00022	.00045	.00092	.00651	.080	.00257
%RSD	47.472	57.684	71.229	15.767	179.37	.41947	2.8985

#1	.00011	.00061	-0.00049	.00475	.00230	19.169	.08562
#2	.00033	.00038	-0.00027	.00624	-.00211	19.012	.09000
#3	.00029	.00016	-0.00114	.00641	.01070	19.118	.09013

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.06786	-0.00042	.00121	7.1908	.16430	.02152	-0.00028
Stddev	.05115	.00221	.00022	.0554	.00055	.00376	.00326
%RSD	75.372	520.61	18.366	.77057	.33523	17.474	1147.5

#1	.12415	-0.00265	.00103	7.2039	.16406	.02038	-0.00404
#2	.02424	-0.00039	.00146	7.2385	.16391	.02571	.00189
#3	.05519	.00177	.00114	7.1300	.16493	.01845	.00129

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702125306 Acquired: 2/28/2017 18:58:43 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: 10 Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00376	.00327	.29297	.00214	.64444	-.01882	-.00522
Stddev	.00532	.00878	.00207	.00124	.00012	.00165	.00283
%RSD	141.56	268.55	.70595	58.038	.01937	8.7909	54.144

#1	-.00201	-.00089	.29137	.00351	.64449	-.01693	-.00839
#2	.00046	-.00266	.29223	.00185	.64430	-.01997	-.00296
#3	-.00974	.01336	.29531	.00107	.64453	-.01957	-.00430

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00144	.00206	.42104
Stddev	.00087	.00011	.91317
%RSD	60.539	5.3359	216.88

#1	.00063	.00202	1.4159
#2	.00134	.00197	-.37895
#3	.00237	.00218	.22615

Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4914.3	70080.	8569.4
Stddev	10.0	165.	50.5
%RSD	.20297	.23600	.58877

#1	4925.4	70250.	8511.9
#2	4911.6	70071.	8606.1
#3	4906.0	69919.	8590.3

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 19:02:32 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.40925	10.258	.41120	.50346	1.0315	.05111	10.301
Stddev	.00384	.019	.00479	.00419	.0016	.00006	.027
%RSD	.93948	.18752	1.1644	.83207	.15802	.11170	.25957

#1	.40593	10.247	.40844	.50191	1.0334	.05113	10.330
#2	.41347	10.280	.41672	.50821	1.0309	.05116	10.297
#3	.40836	10.247	.40843	.50027	1.0303	.05105	10.277

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05088	.20497	.51380	.51630	3.9458	52.342	1.0703
Stddev	.00054	.00041	.00296	.00114	.0271	.219	.0026
%RSD	1.0650	.19887	.57682	.22052	.68787	.41760	.23812

#1	.05094	.20518	.51386	.51720	3.9577	52.578	1.0679
#2	.05031	.20450	.51673	.51668	3.9148	52.302	1.0700
#3	.05138	.20523	.51081	.51502	3.9650	52.147	1.0729

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.9582	.49938	1.0131	51.990	.51098	10.224	.52158
Stddev	.0466	.00076	.0010	.139	.00226	.028	.00612
%RSD	.46843	.15161	.09467	.26681	.44192	.27722	1.1732

#1	9.9087	.49950	1.0122	51.951	.51340	10.254	.51896
#2	9.9643	.49857	1.0141	51.875	.50893	10.221	.52858
#3	10.001	.50007	1.0131	52.144	.51062	10.197	.51721

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Approved: March 01, 2017

Ki K Buck

Sample Name: CCV Acquired: 2/28/2017 19:02:32 Type: QC
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.2526	.41082	5.1189	1.0153	1.0289	.98336	.50426
Stddev	.0026	.00212	.0131	.0020	.0005	.00535	.00624
%RSD	.20390	.51573	.25542	.19553	.05214	.54362	1.2371

#1	1.2528	.41189	5.1211	1.0174	1.0287	.98150	.49891
#2	1.2499	.40837	5.1308	1.0134	1.0296	.98939	.50274
#3	1.2550	.41218	5.1049	1.0152	1.0286	.97920	.51111

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	1.0112	1.0056	F 1.1218
Stddev	.0016	.0016	.5202
%RSD	.15585	.16315	46.376

#1	1.0127	1.0037	.64850
#2	1.0113	1.0064	1.6788
#3	1.0096	1.0066	1.0380

Check ?	Chk Pass	Chk Pass	Chk Fail
Value			1.0000
Range			10.000%

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4906.1	67973.	8136.5
Stddev	16.7	71.	39.6
%RSD	.34018	.10440	.48701

#1	4921.3	68026.	8090.8
#2	4908.7	67893.	8161.6
#3	4888.3	68001.	8157.1

Approved: March 01, 2017

Ki K Buck

Sample Name: CCB Acquired: 2/28/2017 19:06:08 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00180	-0.01223	-0.00256	.00378	.00057	.00013	-0.00467
Stddev	.00098	.00442	.00621	.00146	.00031	.00005	.01059
%RSD	54.618	36.153	242.64	38.645	54.229	42.664	226.55

#1	-0.00127	-0.01159	-0.00552	.00211	.00053	.00009	-0.00939
#2	-0.00119	-0.01693	.00457	.00482	.00090	.00019	.00745
#3	-0.00293	-0.00816	-0.00673	.00440	.00028	.00010	-0.01209

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00037	-0.00034	-0.00098	-0.00022	.00602	.27526	.00054
Stddev	.00022	.00064	.00116	.00363	.00787	.01820	.00276
%RSD	59.070	189.78	117.86	1654.5	130.68	6.6108	514.51

#1	.00038	-0.00012	-0.00112	.00274	.00740	.28085	.00159
#2	.00057	-0.00105	.00024	-0.00427	-0.00244	.29000	.00262
#3	.00014	.00016	-0.00207	.00088	.01311	.25492	-0.00260

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00326	-0.00100	.00135	.24365	-0.00116	.00303	.00115
Stddev	.04498	.00131	.00071	.02144	.00091	.01456	.00303
%RSD	1377.8	130.33	52.481	8.7990	77.893	479.70	263.38

#1	.04272	-0.00047	.00183	.22885	-0.00213	.00299	-0.00158
#2	-0.00535	-0.00250	.00167	.26823	-0.00101	-0.01150	.00061
#3	-0.04717	-0.00005	.00053	.23385	-0.00034	.01761	.00441

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

K. K. Buck

Sample Name: CCB Acquired: 2/28/2017 19:06:08 Type: Blank
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0131	-0.0332	.00188	-0.0052	.00015	.00342	-0.0094
Stddev	.00463	.00984	.00545	.00038	.00017	.00106	.00729
%RSD	353.63	296.67	289.71	73.097	111.30	31.078	776.28

#1	-0.0335	.00615	-0.0088	-0.0065	.00016	.00267	-0.0066
#2	-0.0457	-0.0262	-0.0163	-0.0082	.00032	.00464	.00621
#3	.00399	-0.01349	.00815	-0.0009	-0.0002	.00295	-0.00837

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	.00015	-0.0072	F .05692
Stddev	.00089	.00013	.48543
%RSD	580.55	18.049	852.87

#1	.00087	-0.0085	-0.50350
#2	-0.0085	-0.0070	.34667
#3	.00044	-0.0060	.32758

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			.04000
Low Limit			-.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4984.7	70762.	8311.2
Stddev	7.9	107.	38.1
%RSD	.15928	.15117	.45784

#1	4993.5	70810.	8267.3
#2	4978.2	70837.	8334.2
#3	4982.3	70640.	8332.2

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702126105 Acquired: 2/28/2017 19:10:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00344	.03117	.01976	.08244	2.9076	.00022	F 1172.9
Stddev	.00055	.01017	.00562	.00495	.0038	.00005	8.7
%RSD	15.985	32.625	28.444	6.0044	.13093	23.423	.74591

#1	-0.00373	.02872	.01352	.08810	2.9107	.00017	1180.5
#2	-0.00378	.04235	.02442	.08026	2.9088	.00028	1174.7
#3	-0.00280	.02246	.02133	.07895	2.9034	.00021	1163.3

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							270.00
Low Limit							-10000

Elem	Cd2288	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00306	.00083	-0.00039	.01677	4.9829	232.25	1.2875
Stddev	.00049	.00019	.00085	.00113	.0128	.45	.0041
%RSD	15.912	22.863	218.38	6.7254	.25642	.19267	.31647

#1	.00362	.00079	-0.00112	.01782	4.9961	232.73	1.2841
#2	.00279	.00104	-0.00059	.01691	4.9821	232.16	1.2863
#3	.00276	.00067	.00054	.01558	4.9705	231.85	1.2920

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	P_2149	Pb2203
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.552	2.1053	.00703	71.700	.06444	.04970	.00272
Stddev	.054	.0056	.00029	.102	.00231	.01415	.00518
%RSD	.39611	.26594	4.1491	.14264	3.5776	28.462	190.42

#1	13.557	2.1048	.00727	71.714	.06630	.06434	-.00251
#2	13.496	2.1111	.00671	71.795	.06516	.03610	.00785
#3	13.603	2.0999	.00712	71.592	.06186	.04866	.00282

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Approved: March 01, 2017

Ki K Buck

Sample Name: L1702126105 Acquired: 2/28/2017 19:10:00 Type: Unk
 Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v273) Mode: CONC Corr. Factor: 1.000000
 User: KKB Custom ID1: Custom ID2: Custom ID3:
 Comment: WG604065-01

Elem	Sb2068	Se1960	Si2124	Sn1899	Sr4077	Ti3372	Tl1908
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.00965	F -0.02512	2.5516	.00280	5.8888	F -0.07436	-0.00840
Stddev	.00271	.01944	.0100	.00106	.0076	.00607	.00997
%RSD	28.061	77.368	.39328	37.904	.12839	8.1609	118.65

#1	-0.00654	-0.04751	2.5510	.00260	5.8948	-0.08045	-0.01982
#2	-0.01088	-0.01263	2.5419	.00395	5.8914	-0.07431	-0.00398
#3	-0.01152	-0.01522	2.5620	.00186	5.8803	-0.06831	-0.00141

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit		90.000				36.000	
Low Limit		-0.01000				-0.03000	

Elem	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm
Avg	-0.00080	.00090	F -2.4714
Stddev	.00117	.00008	.7421
%RSD	146.45	8.9623	30.029

#1	-0.00160	.00087	-3.3217
#2	.00054	.00084	-1.9544
#3	-0.00133	.00099	-2.1380

Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			45.000
Low Limit			-0.04000

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	4350.2	61296.	8162.9
Stddev	16.6	267.	21.7
%RSD	.38182	.43547	.26537

#1	4365.1	61342.	8139.9
#2	4353.2	61537.	8165.7
#3	4332.3	61009.	8183.0

Approved: March 01, 2017

Ki K Buck