May 20, 2019

Dylan Rose-Coss
Hydrologist
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Fifth Annual Groundwater Monitoring Report
State M Lease (AP-72)
Lea County, New Mexico

Dear Mr. Rose-Coss:

Equus Environmental, LLC (Equus), on behalf of our client Chesapeake Energy Corporation (Chesapeake), is pleased to submit to the New Mexico Oil Conservation Division (NMOCD) in electronic format the ***Fifth Annual Groundwater Monitoring Report*** (Report) detailing the fifth year of groundwater monitoring and remediation activities conducted at the State M Lease (AP-72) located in the SE-SW-SE of Section 18, Township 17 South, Range 36 East, Lea County, New Mexico. These activities were conducted in accordance with the Stage 2 Abatement Plan for the Site approved by the NMOCD on June 27, 2013.

If you have any questions or comments regarding this Report, please do not hesitate to contact me at (918) 906-6780.

Sincerely,
Equus Environmental, LLC

Bruce E. McKenzie, P.G.
Senior Principal

Enclosure: Fifth Annual Groundwater Monitoring Report

xc: Patrick McMahon - Heidel, Samberson, Newell, Cox & McMahon
Chase Acker - Chesapeake Energy

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FIFTH ANNUAL GROUNDWATER MONITORING REPORT
CHESAPEAKE ENERGY CORPORATION
STATE M LEASE (AP-72)
LEA COUNTY, NEW MEXICO

Prepared for:

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May 20, 2019

EQUUS
Environmental, LLC

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FIFTH ANNUAL GROUNDWATER MONITORING REPORT
CHESAPEAKE ENERGY CORPORATION
STATE M LEASE (AP-72)
LEA COUNTY, NEW MEXICO
MAY 20, 2019

1.0 INTRODUCTION

Chesapeake Energy Corporation (Chesapeake) has retained Equus Environmental, LLC (Equus), to perform impacted groundwater monitoring and light non-aqueous phase liquid (LNAPL) hydrocarbon remediation at Chesapeake's former State M Lease site (Site) located in Lea County, New Mexico. The Site is located approximately 8 miles south-southwest of Lovington, New Mexico in the SE-SW-SE of Section 18, Township 17 South, Range 36 East, Lea County, New Mexico (coordinates 32.828061º latitude, -103.391012º longitude). The Site location and topographic features are shown on **Figure 1**. An oil and gas production tank battery was formerly located at the Site. Chesapeake purchased the Site in 2004, but never operated the tank battery. Chesapeake began abandonment and environmental investigation activities at the Site in 2007.

Initial Site investigation activities were conducted in May 2007. These investigation activities consisted of conducting EM-31 and EM-34 ground conductivity surveys, the collection of soil samples from nine boreholes, and the installation and sampling of seven groundwater monitoring wells. Following the investigation in August 2007, Chesapeake submitted to the New Mexico Oil Conservation Division (NMOCD) a Stage 1 Abatement Plan for the Site. In May 2010, the NMOCD responded to Chesapeake that the agency was not adequately staffed to review the abatement plan in a timely manner and advised Chesapeake that they could proceed with abatement operations at risk. In July 2010, Chesapeake notified the NMOCD of their intent to proceed with the Stage 1 Abatement activities. On March 20, 2012, following implementation of these activities, Chesapeake submitted the Stage 1 Abatement Report for the Site.

On March 27, 2012, Chesapeake submitted to the NMOCD the ***Stage 2 Abatement Plan*** (Plan) for the Site. A copy of the Plan is provided in **Appendix A**. In this Plan, Chesapeake proposed the following abatement activities at the Site:

- Excavate and remove the near-surface soils at the Site containing concentrations of chloride exceeding 1,000 milligrams per kilogram (mg/kg),
- Excavate and remove the near-surface soils at the Site containing concentrations of TPH exceeding 1,000 mg/kg,
- Install clay liners in areas where chloride and/or TPH concentrations exceed 1,000 mg/kg at depths greater than five feet below ground level (bgl),
- Install one additional groundwater monitoring well downgradient of the Site,
- Monitor the groundwater at the Site until the concentrations of chloride and benzene are below the New Mexico Water Quality Control Commission standards.

On March 7, 2013, NMOCD notified Chesapeake that the Plan was administratively complete and that Chesapeake should proceed with public notice of the Plan. On March 30, 2013, Chesapeake published a notice of the proposed activities in the Albuquerque Journal, the Hobbs-Daily News Sun and the Lovington Leader. In addition, written notification of the Plan submittal was sent to all surface owners of record within a 1-mile radius of the Site. On June 27, 2013 upon completion of the notification activities, the NMOCD approved the Plan for the Site. A copy of the NMOCD correspondence approving the Plan is included in **Appendix B**.

The soil remediation activities outlined in the Plan were conducted at the Site during the period January 15, 2014 through March 27, 2014. The soil remediation activities were summarized in the document titled ***Soil Remediation Summary Report***, submitted to the NMOCD on August 6, 2014.

This ***Fifth Annual Groundwater Monitoring Report*** (Report) summarizes the groundwater monitoring activities conducted at the Site during the following quarterly sampling events:

- Seventeenth Event - June 4-5, 2018,
- Eighteenth Event - September 5-6, 2018,
- Nineteenth Event - December 11, 2018,
- Twentieth Event - March 6-7, 2019.

2.0 REMEDIATION

2.1 SVE SYSTEM

As documented in the ***First Annual Groundwater Monitoring Report***, dated May 19, 2015, during the period May 12-14, 2014, a soil vapor extraction (SVE) remediation system (System) was installed and made operational at the Site. The System is comprised of 8 SVE wells connected through a manifold system constructed of two- and three-inch Schedule 80 PVC piping and plumbed to a 10-horsepower 3-phase SVE Regenerative Blower housed within the System Building. The location of the System Building is shown on attached **Figure 2**. Within the System, soil vapor from the SVE wells is drawn through a moisture knock out/separator and a particulate filter prior to reaching the blower. An air-flow meter is installed downstream of the blower in the air-exhaust line and an air sample port is located on the air-exhaust line at a location upstream of its exit from the System Building.

System start-up was conducted on June 6, 2014. Routine checks of the System are conducted to record the blower run times, discharge rate/ACFM and VOC concentration of the discharge-air stream. These field readings are used to calculate the approximate weight of VOCs extracted from the subsurface and discharged from the System. The field PID data are entered into to a spreadsheet to calculate the VOC discharge rate and approximate total pounds removed by the System. The approximate total VOC discharges for each quarter are then summed to provide a cumulative VOC discharge total. These data are summarized in **Table 1**. Through April 18, 2019, the field PID data suggest that approximately 7,134 pounds of VOCs have been removed from the subsurface and discharged from the System.

During the reporting period, discharge-air samples were collected quarterly in laboratory-provided Suma canisters, shipped under chain-of-custody control to TestAmerica Laboratories, Inc. (West Sacramento, California) and analyzed for VOC compounds and total VOCs as hexane by Method TO-15. During the seventeenth quarter, discharge-air sample 20180604-M-SVE was collected on June 4, 2018. On this date, the System had been running for a total of 32,058 hours, was operating at 200 ACFM and had a field reading of 71 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 46,500 PPB volume/volume (46.5 PPM V/V). During the eighteenth quarter, discharge-air sample 20180906-M-SVE was collected on September 18, 2018. On this date, the System had been running for a total of 34,618 hours, was operating at 405 ACFM and had a field reading of 46 PPM from the discharge air stream. Laboratory

analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 76,600 PPB V/V (76.6 PPM V/V). During the nineteenth quarter, discharge-air sample 20181211-M-SVE was collected on December 11, 2018. On this date, the System had been running for a total of 36,474 hours, was operating at 150 ACFM and had a field reading of 90 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 107,000 PPB V/V (107 PPM V/V). During the twentieth quarter, discharge-air sample 20190307-M-SVE was collected on March 7, 2019. On this date, the System had been running for a total of 38,521 hours, was operating at 208 ACFM and had a field reading of 80 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 77,900 PPB V/V (77.9 PPM V/V). A summary of the laboratory analytical results for the discharge-air samples is presented in **Table 2**, and complete copies of the laboratory analytical reports and chain-of-custody documentation are provided in **Appendix C**. The discharge-air analytical data are used to compute a correlation factor for the field PID readings to more accurately calculate the total VOC discharged.

Field PID instrument readings are typically lower than laboratory analysis for total VOCs. To compensate for the low field PID readings, a correlation factor is calculated based upon the ratio of the laboratory analytical value versus the field PID value. The correlation factor is then used to multiply the field PID readings and calculate the total VOC discharge. To accurately reflect the total VOC discharge from the System during a given period, **Table 1** includes the calculated unique correlation factor for each quarterly air-discharge sampling event. This unique correlation factor is then utilized to calculate the total VOC discharge from the System for the period in which that particular air-discharge sample was collected. Utilizing the noted correlation factors, approximately 13,018 pounds of VOCs have been removed from the subsurface at the Site.

Figure 3 presents a graph of the VOC concentrations observed in the discharge air stream versus time. As can be seen on this figure, the levels of VOC observed in the air discharge stream have decreased dramatically since startup. These data indicate that the System is effective at removing the hydrocarbon vapors from the subsurface. Removal of hydrocarbon vapors coupled with the influx of oxygen drawn into the impacted area by the System enhances biodegradation of the hydrocarbon impacts observed in this area.

2.2 MW-1R LNAPL RECOVERY

As documented in the ***First Annual Groundwater Monitoring Report***, dated May 19, 2015, to enhance LNAPL recovery in the MW-1R area, 2-inch diameter monitoring well MW-1 was plugged and replaced with 4-inch diameter monitoring well MW-1R. On June 5, 2014, a QED Environmental Genie LNAPL recovery pump was placed and made operational in monitoring well MW-1R. The Genie LNAPL recovery pump is an air-actuated bladder pump with a floating intake (skimmer), set at a depth that produces the maximum amount of LNAPL recovery per cycle. Air is provided to the Genie LNAPL recovery pump from a compressor located within the System Building.

During the reporting period, approximately 0.5 drums (25 gallons) of LNAPL were recovered from monitoring well MW-1R. Since start-up of the Genie LNAPL recovery pump, a total of approximately 14.5 drums (797.5 gallons) of LNAPL have been recovered from the Site. During each quarterly monitoring event, the recovery pump and controller is inspected, cleaned and adjusted to maximize LNAPL recovery. During this reporting period, a series of pump failures precluded LNAPL recovery typically observed in previous reporting events. Discussions detailing these pump failures are provided in Sections 3.2, 3.3, 3.4 and 3.5.

3.0 QUARTERLY GROUNDWATER MONITORING

This Report describes the findings from four quarterly groundwater sampling events conducted at the Site from June 4, 2018 through March 6, 2019.

3.1 GROUNDWATER MONITORING METHODOLOGY

Prior to collecting groundwater samples during each quarterly event, EQUUS gauged all 8 monitoring wells (MW-1R through MW-8) at the Site using an electronic interface probe to determine the depth-to-water (DTW) and LNAPL thickness within each well. The locations of these monitoring wells are shown on **Figure 2**. DTWs were measured from the surveyed top-of-casing (TOC) of each well and converted to elevations relative to mean sea level. These data are presented in **Table 3**. Potentiometric surface maps were constructed utilizing these data to illustrate the groundwater flow direction within the shallow groundwater system beneath the Site. These potentiometric surface maps are presented on **Figures 4** through **7**. As can be seen on the figures, groundwater flow at the Site is, in general, from the northwest to the southeast.

Upon completion of DTW measurement activities, Equus field personnel collected groundwater samples per the Plan. As specified in the Plan, chloride is the primary constituent of concern (COC) at the Site until the LNAPL has been adequately eliminated from monitoring well MW-1R. When the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well will be monitored for benzene, toluene, ethylbenzene and total xylenes (BTEX) until the levels of BTEX fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively.

The laboratory analytical results for chloride from these sampling events are screened against *the* ***New Mexico Administrative Code 20.6.2, Standards for Groundwater of 10,000 mg/L TDS Concentration or Less*** for chloride of 250 mg/L (Limit). According to the remediation goals set in the Plan, each monitoring well is required to exhibit eight consecutive monitoring events where chloride is below the Limit of 250 mg/L. When these remediation goals are met, Chesapeake will cease groundwater sampling activities for chloride.

As recommended in the ***Fourth Annual Groundwater Monitoring Report***, dated May 14, 2018, during this reporting period groundwater samples were only collected from monitoring wells MW-4 and MW-8 for chloride analysis due to the remaining monitoring wells having

already achieved the abatement goal of eight consecutive quarters of chloride concentrations below 250 mg/L.

The groundwater samples from monitoring wells MW-4 and MW-8 were collected utilizing EPA approved low-flow purging/sampling methodologies. Field parameters consisting of pH, specific conductivity, temperature, and dissolved oxygen (DO) were measured during field activities utilizing a multi-parameter meter and air-tight flow-through cell. Upon stabilization of the field parameters, groundwater samples were collected into laboratory prepared containers, labeled as to source and contents, placed on ice for preservation, placed under chain-of-custody control and shipped via overnight courier to the analytical laboratory (TestAmerica Inc., Nashville, Tennessee). As per the Plan, groundwater samples collected from these monitoring wells were analyzed for chloride by EPA Method 300.0. A summary of the laboratory analytical results for chloride analyses is presented in **Table 4**, and complete copies of the laboratory analytical reports and chain-of-custody documentation is provided in **Appendix C**.

3.2 SEVENTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The seventeenth groundwater sampling event was conducted at the Site during the period June 4-5, 2018. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (413 mg/L) and MW-8 (539 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the seventeenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 0.37 feet. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

3.3 EIGHTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The eighteenth quarterly groundwater sampling event was conducted at the Site during the period September 5-6, 2018. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (387 mg/L) and MW-8 (398 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the eighteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 2.50 feet. The measurement from this event indicates an increase of 2.13 feet in the observed LNAPL thickness from the previous event. This increase of apparent LNAPL thickness was attributed to the failure of the LNAPL skimmer

pump. The pump was subsequently removed from monitoring well MW-1R, cleaned and repaired on-Site, and redeployed within monitoring well MW-1R.

3.4 NINETEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The nineteenth quarterly groundwater sampling event was conducted at the Site on December 11, 2018. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (373 mg/L) and MW-8 (474 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the nineteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 2.77 feet. The measurement from this event indicates a slight increase of 0.27 feet in the observed LNAPL thickness from the previous event. This increase of apparent LNAPL thickness was once again attributed to the failure or the LNAPL skimmer pump. The pump was subsequently removed from monitoring well MW-1R and repaired.

3.5 TWENTIETH QUARTERLY GROUNDWATER SAMPLING RESULTS

The twentieth quarterly groundwater sampling event was conducted at the Site during the period March 6-7, 2019. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (617 mg/L) and MW-8 (308 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L. **Figure 8** presents an isopleth of the chloride concentrations observed in the groundwater samples collected during this sampling event. As can be seen on this figure, the highest levels of chloride observed in Site groundwater are observed in monitoring wells MW-4 and MW-8, in the southeast portion of the Site. To complete the chloride isopleth, Equus utilized the chloride concentrations detected in the groundwater samples collected from monitoring wells MW-1 through MW-3 and MW-5 through MW-7 during the March 2018 sampling event.

Figure 9 presents chloride concentration trend graphs for each of the monitoring wells sampled at the Site. A review of this figure indicates that the chloride concentration trends observed in the groundwater samples are, in general, stable in monitoring well MW-8 and decreasing in monitoring well MW-4. The soil remediation activities conducted at the Site in the first quarter of 2014 have removed the continuing source of chloride impacts to the groundwater at the Site. Source removal has facilitated the physical natural attenuation mechanisms of dispersion and dilution on remnant chloride concentrations present in Site groundwater.

During the twentieth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 2.72 feet. The measurement from this event indicates a slight decrease of 0.05 feet in the observed LNAPL thickness from the previous event. During re-deployment of the LNAPL skimmer pump, the pump drive mechanism failed, and the pump was once again returned for repairs.

4.0 CONCLUSIONS

Based upon the data presented herein, the following conclusions are presented:

- Groundwater beneath the Site is encountered at depths ranging from approximately 46 to 49 feet from the surveyed tops-of-casing of the Site monitoring wells.

- The direction of groundwater flow at the Site is, in general, from the northwest to the southeast.

- During the reporting period, concentrations of chloride greater than the Limit of 250 mg/L were observed in the groundwater samples collected from monitoring wells MW-4 (ranging from 373 mg/L to 617 mg/L) and MW-8 (ranging from 308 mg/L to 539 mg/L).

- The SVE System is operating as designed and has removed approximately 13,018 pounds of VOCs since start-up on June 6, 2014.

- During the reporting period, approximately 0.5 drums (25 gallons) of LNAPL were recovered from monitoring well MW-1R.

5.0 RECOMMENDATIONS

Based upon a review of the data presented within this report, the following recommendations have been developed:

- Operation of the SVE System at the Site should continue until the LNAPL observed on the groundwater in the monitoring well MW-1R area has been adequately eliminated.

- As specified in the Plan, LNAPL recovery within monitoring well MW-1R should be continued until the LNAPL observed within this well has been adequately eliminated. Efforts to optimize LNAPL recovery while minimizing pump down-time should be implemented.

- As specified in the Plan, when the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well should be monitored for BTEX until the levels of these constituents fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively, for eight quarters.

- The groundwater within monitoring wells MW-4 and MW-8 should continue to be monitored on a quarterly basis for chloride until the eight quarters of sample results indicate the chloride levels observed in this well are below the New Mexico Water Quality Control Commission standards. The next groundwater monitoring event at the Site is scheduled to be conducted in June 2019.

TABLES

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings		VOC Discharge				Calculated Correlation Factor
			since last reading	Total	PPM	CFM	lbs/Hr	lbs since last Reading	Total lbs	Total Tons	
06/07/14	8:00	4131.73	19.73	20	596	519	2.281	44.99	44.99	0.02	0.98
06/08/14	7:10	4154.69	22.96	43	398	483	1.416	32.50	77.50	0.04	
06/08/14	9:15	4156.94	2.25	45	5000	489	18.021	40.55	118.05	0.06	
06/12/14	12:40	4256.45	99.51	144	1817	120	1.607	159.92	277.96	0.14	
06/12/14	12:43	4259.65	3.20	148	1561	117	1.346	4.31	282.27	0.14	
06/13/14	7:15	4274.90	18.45	163	1804	122	1.622	29.93	307.89	0.15	
06/13/14	7:17	4276.27	1.37	164	3390	121	3.023	4.14	312.03	0.16	
06/13/14	7:18	4277.08	0.81	165	2301	120	2.035	1.65	313.68	0.16	
06/19/14	12:05	4422.02	144.94	310	1153	120	1.020	147.81	461.49	0.23	
06/19/14	13:30	4423.74	1.72	312	1117	107	0.881	1.52	463.00	0.23	
06/19/14	16:00	4426.00	2.26	314	1448	121	1.291	2.92	465.92	0.23	
06/24/14	12:05	4543.27	117.27	431	*1440*	*120*	1.274	149.36	615.28	0.31	
06/26/14	12:40	4591.01	165.01	479	1970	127	1.844	304.28	919.56	0.46	
06/26/14	12:42	4593.20	2.19	481	1968	120	1.741	3.81	923.37	0.46	
07/03/14	9:35	4755.92	162.72	644	1650	126	1.532	249.34	1172.71	0.59	
07/03/14	9:37	4757.95	2.03	646	1318	126	1.224	2.48	1175.20	0.59	
07/09/14	11:40	4901.77	143.82	790	875	126	0.812	116.80	1292.00	0.65	
07/09/14	11:42	4903.69	1.92	792	795	124	0.727	1.40	1293.39	0.65	
07/17/14	12:33	5094.48	190.79	982	*790*	124	0.722	137.75	1431.15	0.72	
07/17/14	12:34	5095.13	0.65	983	*790*	127	0.739	0.48	1431.63	0.72	
07/17/14	12:36	5097.75	2.62	986	*790*	127	0.739	1.94	1433.56	0.72	
08/01/14	11:00	5452.10	354.35	1,340	1078	139	1.104	391.35	1824.91	0.91	
08/01/14	11:42	5454.03	1.93	1,342	938	150	1.037	2.00	1826.91	0.91	1.86
08/01/14	11:44	5456.32	2.29	1,344	2314	14	0.239	0.55	1827.46	0.91	
10/10/14	13:00	7118.38	1662.06	3,006	130	51	0.049	81.70	1909.16	0.95	
10/10/14	13:02	7120.15	1.77	3,008	216	58	0.093	0.16	1909.32	0.95	
10/31/14	13:00	7622.85	502.70	3,511	161	48	0.057	28.63	1937.95	0.97	
10/31/14	13:04	7624.49	1.64	3,512	78	54	0.031	0.05	1938.00	0.97	
12/11/14	13:50	8607.53	983.04	4,496	352	***131***	0.340	334.10	2272.11	1.14	
01/15/15	10:11	9441.32	833.79	5,329	47	131	0.045	37.60	2309.70	1.15	0.21
01/15/15	10:12	9442.31	0.99	5,330	173	152	0.194	0.19	2309.89	1.15	
01/15/15	10:15	9445.26	2.95	5,333	388	136	0.389	1.15	2311.04	1.16	
01/29/15	11:50	9778.04	332.78	5,666	240	54	0.095	31.49	2342.53	1.17	
01/29/15	11:52	9780.13	2.09	5,668	239	50	0.088	0.18	2342.72	1.17	
02/26/15	11:00	10448.98	668.85	6,337	72	137	0.073	48.63	2391.35	1.20	
02/26/15	11:02	10450.10	1.12	6,338	178	155	0.204	0.23	2391.57	1.20	
03/12/15	10:15	10780.66	330.56	6,669	483	***155***	0.552	182.40	2573.97	1.29	
04/28/15	8:30	11901.34	1120.68	7,789	126	114	0.106	118.86	2692.84	1.35	1.10
04/28/15	8:36	11907.42	6.08	7,795	132	126	0.123	0.75	2693.58	1.35	
05/14/15	9:05	12285.12	377.70	8,173	96	55	0.039	14.68	2708.26	1.35	
05/14/15	9:10	12290.05	4.93	8,178	105	58	0.045	0.22	2708.48	1.35	
05/28/15	11:30	12623.70	333.65	8,512	6	150	0.006	2.07	2710.55	1.36	
06/11/15	10:39	12650.70	27.00	8,539	318	172	0.403	10.88	2721.43	1.36	
07/02/15	11:00	13154.04	503.34	9,042	85	112	0.070	35.32	2756.75	1.38	0.76
09/03/15	8:00	14662.17	1508.13	10,550	249	104	0.191	287.85	3044.60	1.52	
12/10/15	13:00	17015.28	2353.11	12,903	162	95	0.113	266.92	3311.52	1.66	0.86

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings		VOC Discharge				Calculated Correlation Factor
			since last reading	Total	PPM	CFM	lbs/Hr	lbs since last Reading	Total lbs	Total Tons	
03/10/16	12:00	17899.58	884.30	13,788	209	105	0.162	143.03	3454.55	1.73	1.78
06/29/16	8:00	20558.59	2659.01	16,447	156	101	0.116	309.58	3764.13	1.88	3.77
07/27/16	12:30	21232.43	673.84	17,120	126	103	0.095	64.20	3828.33	1.91	
08/25/16	11:00	21927.96	695.53	17,816	115	270	0.229	159.45	3987.78	1.99	1.55
09/22/16	10:20	22596.81	668.85	18,485	169	220	0.274	183.07	4170.85	2.09	
12/08/16	9:30	24443.73	1846.92	20,332	109	220	0.177	327.03	4497.88	2.25	6.59
01/10/17	12:23	24758.20	314.47	20,646	173	233	0.297	93.37	4591.25	2.30	
01/25/17	10:56	25115.43	357.23	21,003	206	179	0.271	96.95	4688.20	2.34	3.06
02/22/17	10:35	25786.27	670.84	21,674	248	214	0.391	262.30	4950.50	2.48	
03/09/17	11:04	26146.82	360.55	22,035	321	209	0.495	178.51	5129.01	2.56	
04/05/17	11:55	26792.33	645.51	22,680	454	113	0.378	244.08	5373.09	2.69	
05/16/17	7:00	26967.77	175.44	22,856	61	198	0.089	15.69	5388.79	2.69	5.78
06/07/17	13:00	27495.83	528.06	23,384	54	221	0.087	46.02	5434.80	2.72	
09/07/17	11:36	29698.50	2202.67	25,587	62	200	0.091	201.31	5636.11	2.82	
09/22/17	11:30	30057.43	358.93	25,945	56	211	0.087	31.26	5667.37	2.83	
10/04/17	10:15	30344.40	286.97	26,232	57	198	0.083	23.87	5691.24	2.85	0.81
11/02/17	13:00	31042.78	698.38	26,931	58	185	0.079	55.23	5746.48	2.87	
12/01/17	12:30	31739.31	696.53	27,627	59	192	0.083	58.16	5804.63	2.90	
12/06/17	12:40	31859.62	120.31	27,748	6	270	0.011	1.36	5806.00	2.90	
12/18/17	15:00	32149.36	289.74	28,037	60	208	0.092	26.65	5832.65	2.92	
01/09/18	10:00	32672.25	522.89	28,560	52	189	0.072	37.88	5870.52	2.94	
01/26/18	10:15	33080.48	408.23	28,968	48	172	0.061	24.84	5895.36	2.95	
02/09/18	13:10	33416.85	336.37	29,305	32	220	0.052	17.45	5912.82	2.96	0.19
02/23/18	11:15	33753.60	336.75	29,642	34	186	0.047	15.70	5928.51	2.96	
03/07/18	10:55	34040.75	287.15	29,929	52	227	0.087	24.98	5953.50	2.98	
03/16/18	13:03	34251.67	210.92	30,140	48	195	0.069	14.55	5968.05	2.98	
04/13/18	9:15	34970.90	719.23	30,859	46	200	0.068	48.77	6016.82	3.01	
04/30/18	13:16	35332.87	361.97	31,221	46	200	0.068	24.54	6041.36	3.02	
05/15/18	13:34	35692.17	359.30	31,580	48	200	0.071	25.42	6066.78	3.03	
05/29/18	14:20	36028.04	335.87	31,916	48	200	0.071	23.77	6090.55	3.05	0.65
06/04/18	16:30	36169.50	141.46	32,058	71	200	0.105	14.81	6105.35	3.05	
06/20/18	14:30	36556.30	386.80	32,444	48	200	0.071	27.37	6132.72	3.07	
07/03/18	10:30	36865.13	308.83	32,753	56	520	0.215	66.28	6199.01	3.10	
07/19/18	10:40	37249.27	384.14	33,137	46	486	0.165	63.30	6262.30	3.13	
08/09/18	12:30	37754.97	505.70	33,643	58	386	0.165	83.45	6345.75	3.17	2.13
09/06/18					36						
09/19/18	12:00	38730.31	975.34	34,618	46	405	0.137	133.93	6479.67	3.24	
10/04/18	15:30	39093.45	363.14	34,981	73	425	0.227	82.47	6562.14	3.28	
10/18/18	13:00	39428.14	334.69	35,316	42	261	0.081	27.04	6589.19	3.29	
10/31/18	13:40	39716.90	288.76	35,605	52	317	0.121	35.08	6624.27	3.31	
11/16/18	8:00	39983.80	266.90	35,872	68	156	0.078	20.87	6645.14	3.32	1.19
11/16/18	9:54	39985.70	1.90	35,874	77	264	0.149	0.28	6645.42	3.32	
12/11/18	14:20	40585.95	600.25	36,474	90	150	0.099	59.53	6704.95	3.35	
12/27/18	13:40	40965.57	379.62	36,854	72	310	0.165	62.45	6767.40	3.38	

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings		VOC Discharge				Calculated Correlation Factor
			since last reading	Total	PPM	CFM	lbs/Hr	lbs since last Reading	Total lbs	Total Tons	
01/24/19	14:58	41636.05	670.48	37,524	63	275	0.128	85.62	6853.01	3.43	
02/05/19	12:02	41919.95	283.90	37,808	48	251	0.088	25.08	6878.09	3.44	
02/21/19	12:00	42303.95	384.00	38,192	26	218	0.042	16.10	6894.20	3.45	
03/07/19	7:00	42632.85	328.90	38,521	80	208	0.122	40.29	6934.48	3.47	0.97
03/22/19	11:09	42986.51	353.66	38,875	47	177	0.062	21.78	6956.26	3.48	
04/03/19	15:00	43277.65	291.14	39,166	58	440	0.186	54.29	7010.55	3.51	
04/18/19	12:00	43634.32	356.67	39,522	105	450	0.348	124.21	7134.76	3.57	
								Corrected Total:	13,018.67	6.60	

Notes:

1. Color shading indicates air sampling period with a unique correlation factor.
2. During the June 24 & July 17, 2014 site visit the field readings were not recorded. The italicized values presented above for these dates are conservative estimated values based upon last known readings.

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	*Sample ID:*	SVE	Canister #34000823 Serial C8528 2014-12-11	CANISTER #C8522	Canister #8408 2015-06-11 Air Sample	Canister #5451 Batch #320-14155 9-3-15	CANISTER #34000512 BATCH ID #320-15930	STATE M-1 LEASE	20160629 M SVE	20160922 M SVE	20161208 M SVE	20170309 M SVE	20170607M SVE	20170907 M SVE	20171206 -M-SVE	20180307-M-SVE
	Sample Date:	1-Aug-14	11-Dec-14	12-Mar-15	11-Jun-15	3-Sep-15	10-Dec-15	10-Mar-16	29-Jun-16	22-Sep-16	8-Dec-16	9-Mar-17	7-Jun-17	7-Sep-17	6-Dec-17	7-Mar-18
Volatile Organic Compounds by TO-15																
Acetone	ppb v/v	<2000	<615	<965	<860	<615	<370	<915	<280	<175	<106	<203	<76.0	<116	<20.0	**5.67**
Benzene	ppb v/v	**8,820**	**2,960**	**533**	**3,630**	**312**	**194**	**1,070**	**2,600**	**853**	**373**	**550**	**180**	**143**	**1.77**	**24.5**
Benzyl chloride	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Bromodichloromethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	103.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Bromoform	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Bromomethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
2-Butanone (MEK)	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	**178**	<3.20	<0.800
Carbon disulfide	ppb v/v	**1,800**	**272**	<154	<138	<98.4	<59.2	<146	**177**	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Carbon tetrachloride	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Chlorobenzene	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Dibromochloromethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Chloroethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Chloroform	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Chloromethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
1,2-Dibromoethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
1,2-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,3-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,4-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Dichlorodifluoromethane	ppb v/v	**1,980**	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1-Dichloroethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
1,2-Dichloroethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	**0.881**
1,1-Dichloroethene	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
cis-1,2-Dichloroethene	ppb v/v	<160	<49.2	**84.5**	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
trans-1,2-Dichloroethene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2-Dichloropropane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
cis-1,3-Dichloropropene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
trans-1,3-Dichloropropene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Ethylbenzene	ppb v/v	**13,500**	**3,830**	**799**	**2,890**	**731**	**723**	**446**	**2,530**	**1,390**	**531**	**908**	**229**	**219**	**4.75**	**25.4**
4-Ethyltoluene	ppb v/v	**974**	**533**	**164**	**299**	**256**	**186**	<73.2	**660**	**497**	**135**	**263**	**58.5**	**45.1**	**2.38**	**3.74**
Hexachlorobutadiene	ppb v/v	<800	<246	<386	<344	<246	<148	<366	<112	<69.8	<42.2	<81.0	<30.4	<46.2	<8.00	<2.00
2-Hexanone	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Methylene Chloride	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	**0.540**
4-Methyl-2-pentanone	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Styrene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1,2,2-Tetrachloroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	**41.1**	<14.0	<8.44	**20.0**	<6.08	<9.24	<1.60	<0.400
Tetrachloroethene	ppb v/v	<160	**71.9**	<77.2	<68.8	<49.2	<29.6	**92.9**	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Toluene	ppb v/v	**4,020**	**1,040**	**228**	**1,480**	<49.2	<29.6	**120**	**975**	**380**	**164**	**193**	**68.4**	**49.2**	<1.60	**6.92**
1,2,4-Trichlorobenzene	ppb v/v	<800	<246	<386	<344	<246	<148	<366	<112	<69.8	<42.2	<81.0	<30.4	<46.2	<8.00	<2.00
1,1,1-Trichloroethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
1,1,2-Trichloroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	*Sample ID:* / *Sample Date:*	SVE 1-Aug-14	Canister #34000823 Serial C8528 2014-12-11 11-Dec-14	CANISTER #C8522 12-Mar-15	Canister #8408 2015-06-11 Air Sample 11-Jun-15	Canister #5451 Batch #320-14155 9-3-15 3-Sep-15	CANISTER #34000512 BATCH ID #320-15930 10-Dec-15	STATE M-1 LEASE 10-Mar-16	20160629 M SVE 29-Jun-16	20160922 M SVE 22-Sep-16	20161208 M SVE 8-Dec-16	20170309 M SVE 9-Mar-17	20170607M SVE 7-Jun-17	20170907 M SVE 7-Sep-17	20171206 -M-SVE 6-Dec-17	20180307-M-SVE 7-Mar-18
Trichloroethene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Trichlorofluoromethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2,4-Trimethylbenzene	ppb v/v	**2,020**	**648**	**299**	**774**	<98.4	**355**	<146	**968**	**740**	**228**	**411**	**85.9**	**50.3**	**7.35**	**9.05**
1,3,5-Trimethylbenzene	ppb v/v	**821**	**385**	**172**	**353**	**73.0**	**247**	<73.2	**727**	**541**	**192**	**397**	**53.6**	**45.5**	**6.18**	**5.81**
Vinyl acetate	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Vinyl chloride	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.8	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
m,p-Xylene	ppb v/v	**12,700**	**4,680**	**1,110**	**3,920**	**1,140**	**1,380**	**609**	**5,050**	**2,550**	**870**	**1,510**	**322**	**330**	**10.3**	**48.7**
o-Xylene	ppb v/v	**4,520**	**1,190**	**286**	**1,120**	**164**	**194**	**107**	**720**	**419**	**177**	**337**	**98.4**	**96.4**	**2.54**	**15.6**
Total VOC as Hexane (C6-C12)	ppb v/v	**1,060,000**	**655,000**	**99,400**	**351,000**	**190,000**	**140,000**	**371,000**	**590,000**	**262,000**	**117,000**	**167,000**	**54,500**	**40,900**	**4,630**	**9,930**

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	*Sample ID:*	20180604-M-SVE	20180906-M-SVE	20181211-M-SVE	20190307 M SVE
	Sample Date:	4-Jun-18	6-Sep-18	11-Dec-18	7-Mar-19
Volatile Organic Compounds by TO-15					
Acetone	ppb v/v	<78.0	<124	<178	<22.3
Benzene	ppb v/v	**87.9**	**112**	**137**	**40.1**
Benzyl chloride	ppb v/v	<12.5	<19.8	<28.4	<3.56
Bromodichloromethane	ppb v/v	<4.68	<7.43	<10.7	<1.34
Bromoform	ppb v/v	<6.24	<9.91	<14.2	<1.78
Bromomethane	ppb v/v	<12.5	<19.8	<28.4	<3.56
2-Butanone (MEK)	ppb v/v	<12.5	<19.8	<28.4	**5.97**
Carbon disulfide	ppb v/v	<12.5	<19.8	<28.4	<3.56
Carbon tetrachloride	ppb v/v	<12.5	<19.8	<28.4	<3.56
Chlorobenzene	ppb v/v	<4.68	<7.43	<10.7	<1.34
Dibromochloromethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
Chloroethane	ppb v/v	<12.5	<19.8	<28.4	<3.56
Chloroform	ppb v/v	<4.68	<7.43	<10.7	<1.34
Chloromethane	ppb v/v	<12.5	<19.8	<28.4	<3.56
1,2-Dibromoethane	ppb v/v	<12.5	<19.8	<28.4	<3.56
1,2-Dichlorobenzene	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,3-Dichlorobenzene	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,4-Dichlorobenzene	ppb v/v	<6.24	<9.91	<14.2	<1.78
Dichlorodifluoromethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,1-Dichloroethane	ppb v/v	<4.68	<7.43	<10.7	<1.34
1,2-Dichloroethane	ppb v/v	<12.5	<19.8	<28.4	<3.56
1,1-Dichloroethene	ppb v/v	<12.5	<19.8	<28.4	<3.56
cis-1,2-Dichloroethene	ppb v/v	<6.24	<9.91	<14.2	<1.78
trans-1,2-Dichloroethene	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,2-Dichloropropane	ppb v/v	<6.24	<9.91	<14.2	<1.78
cis-1,3-Dichloropropene	ppb v/v	<6.24	<9.91	<14.2	<1.78
trans-1,3-Dichloropropene	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
Ethylbenzene	ppb v/v	**250**	**334**	**363**	**284**
4-Ethyltoluene	ppb v/v	**42.7**	**89.2**	**76.7**	**167**
Hexachlorobutadiene	ppb v/v	<31.2	<49.5	<71.0	<8.90
2-Hexanone	ppb v/v	<4.68	<9.91	<14.2	<1.78
Methylene Chloride	ppb v/v	<6.24	<9.91	<14.2	<1.78
4-Methyl-2-pentanone	ppb v/v	<6.24	<9.91	<14.2	<1.78
Styrene	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,1,2,2-Tetrachloroethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
Tetrachloroethene	ppb v/v	<6.24	<9.91	<14.2	<1.78
Toluene	ppb v/v	**34.4**	**44.3**	**41.0**	**38.8**
1,2,4-Trichlorobenzene	ppb v/v	<31.2	<49.5	<71.0	<8.90
1,1,1-Trichloroethane	ppb v/v	<4.68	<7.43	<10.7	<1.34
1,1,2-Trichloroethane	ppb v/v	<6.24	<9.91	<14.2	<1.78

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	*Sample ID:*	20180604-M-SVE	20180906-M-SVE	20181211-M-SVE	20190307 M SVE
	Sample Date:	4-Jun-18	6-Sep-18	11-Dec-18	7-Mar-19
Trichloroethene	ppb v/v	<6.24	<9.91	<14.2	<1.78
Trichlorofluoromethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<6.24	<9.91	<14.2	<1.78
1,2,4-Trimethylbenzene	ppb v/v	**71.3**	**134**	**124**	**83.0**
1,3,5-Trimethylbenzene	ppb v/v	**46.2**	**88.6**	**102**	**67.0**
Vinyl acetate	ppb v/v	<12.5	<19.8	<28.4	<3.56
Vinyl chloride	ppb v/v	<6.24	<9.91	<14.2	<1.78
m,p-Xylene	ppb v/v	**376**	**501**	**544**	**442**
o-Xylene	ppb v/v	**107**	**133**	**158**	**137**
Total VOC as Hexane (C6-C12)	ppb v/v	**46,500**	**76,600**	**107,000**	**77,900**

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-1R	3888.97	06/03/14	44.57	49.89	5.32	3839.08
	3888.97	09/22/14	44.87	48.91	4.04	3840.06
	3888.97	12/10/14	45.80	46.30	0.50	3842.67
	3888.97	03/11/15	45.12	46.83	1.71	3842.14
	3888.97	06/10/15	45.54	46.31	0.77	3842.66
	3888.97	09/02/15	45.81	47.37	1.56	3841.60
	3888.97	12/09/15	45.22	49.07	3.85	3839.90
	3888.97	03/09/16	45.30	47.18	1.88	3841.79
	3888.97	06/28/16	45.75	47.02	1.27	3841.95
	3888.97	09/21/16	46.10	46.38	0.28	3842.59
	3888.97	12/07/16	46.13	46.88	0.75	3842.09
	3888.97	03/08/17	46.14	46.57	0.43	3842.40
	3888.97	06/06/17	45.82	48.86	3.04	3840.11
	3888.97	09/08/17	46.30	46.63	0.33	3842.34
	3888.97	12/04/17	46.36	46.77	0.41	3842.20
	3888.97	03/05/18	46.47	46.81	0.34	3842.16
	3888.97	06/05/18	46.56	46.93	0.37	3842.04
	3888.97	09/05/18	46.31	48.81	2.50	3840.16
	3888.97	12/11/18	46.34	49.11	2.77	3839.86
	3888.97	03/06/19	46.48	49.20	2.72	3839.77
MW-2	3890.51	06/03/14	--	47.23	--	3843.28
	3890.51	09/22/14	--	46.37	--	3844.14
	3890.51	12/10/14	--	45.91	--	3844.60
	3890.51	03/11/15	--	46.03	--	3844.48
	3890.51	06/10/15	--	46.38	--	3844.13
	3890.51	09/02/15	--	46.44	--	3844.07
	3890.51	12/09/15	--	46.51	--	3844.00
	3890.51	03/09/16	--	46.61	--	3843.90
	3890.51	06/28/16	--	46.70	--	3843.81
	3890.51	09/21/16	--	46.80	--	3843.71
	3890.51	12/07/16	--	46.82	--	3843.69
	3890.51	03/08/17	--	46.88	--	3843.63
	3890.51	06/06/17	--	46.98	--	3843.53
	3890.51	09/08/17	--	47.06	--	3843.45
	3890.51	12/04/17	--	47.11	--	3843.40
	3890.51	03/05/18	--	47.22	--	3843.29
	3890.51	06/05/18	--	47.31	--	3843.20
	3890.51	09/05/18	--	47.36	--	3843.15
	3890.51	12/11/18	--	47.46	--	3843.05
	3890.51	03/06/19	--	47.51	--	3843.00

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-3	3889.34	06/03/14	--	46.35	--	3842.99
	3889.34	09/22/14	--	46.49	--	3842.85
	3889.34	12/10/14	--	46.08	--	3843.26
	3889.34	03/11/15	--	46.28	--	3843.06
	3889.34	06/10/15	--	46.51	--	3842.83
	3889.34	09/02/15	--	46.60	--	3842.74
	3889.34	12/09/15	--	46.68	--	3842.66
	3889.34	03/09/16	--	46.72	--	3842.62
	3889.34	06/28/16	--	46.85	--	3842.49
	3889.34	09/21/16	--	46.96	--	3842.38
	3889.34	12/07/16	--	47.02	--	3842.32
	3889.34	03/08/17	--	47.11	--	3842.23
	3889.34	06/06/17	--	47.13	--	3842.21
	3889.34	09/08/17	--	47.23	--	3842.11
	3889.34	12/04/17	--	47.28	--	3842.06
	3889.34	03/05/18	--	47.44	--	3841.90
	3889.34	06/05/18	--	47.48	--	3841.86
	3889.34	09/05/18	--	47.55	--	3841.79
	3889.34	12/11/18	--	47.60	--	3841.74
	3889.34	03/06/19	--	47.68	--	3841.66
MW-4	3888.90	06/03/14	--	46.38	--	3842.52
	3888.90	09/22/14	--	46.50	--	3842.40
	3888.90	12/10/14	--	46.14	--	3842.76
	3888.90	03/11/15	--	46.35	--	3842.55
	3888.90	06/10/15	--	46.49	--	3842.41
	3888.90	09/02/15	--	46.57	--	3842.33
	3888.90	12/09/15	--	46.68	--	3842.22
	3888.90	03/09/16	--	46.75	--	3842.15
	3888.90	06/28/16	--	46.87	--	3842.03
	3888.90	09/21/16	--	46.94	--	3841.96
	3888.90	12/07/16	--	47.03	--	3841.87
	3888.90	03/08/17	--	47.08	--	3841.82
	3888.90	06/06/17	--	47.15	--	3841.75
	3888.90	09/08/17	--	47.24	--	3841.66
	3888.90	12/04/17	--	47.29	--	3841.61
	3888.90	03/05/18	--	47.38	--	3841.52
	3888.90	06/05/18	--	47.50	--	3841.40
	3888.90	09/05/18	--	47.53	--	3841.37
	3888.90	12/11/18	--	47.62	--	3841.28
	3888.90	03/06/19	--	47.72	--	3841.18

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-5	3890.41	06/03/14	--	46.56	--	3843.85
	3890.41	09/22/14	--	46.70	--	3843.71
	3890.41	12/10/14	--	46.29	--	3844.12
	3890.41	03/11/15	--	46.44	--	3843.97
	3890.41	06/10/15	--	46.69	--	3843.72
	3890.41	09/02/15	--	46.79	--	3843.62
	3890.41	12/09/15	--	46.85	--	3843.56
	3890.41	03/09/16	--	46.90	--	3843.51
	3890.41	06/28/16	--	47.08	--	3843.33
	3890.41	09/21/16	--	47.13	--	3843.28
	3890.41	12/07/16	--	47.14	--	3843.27
	3890.41	03/08/17	--	47.23	--	3843.18
	3890.41	06/06/17	--	47.32	--	3843.09
	3890.41	09/08/17	--	47.40	--	3843.01
	3890.41	12/04/17	--	47.27	--	3843.14
	3890.41	03/05/18	--	47.54	--	3842.87
	3890.41	06/05/18	--	47.66	--	3842.75
	3890.41	09/05/18	--	47.72	--	3842.69
	3890.41	12/11/18	--	47.80	--	3842.61
	3890.41	03/06/19	--	47.85	--	3842.56
MW-6	3888.25	06/03/14	--	46.25	--	3842.00
	3888.25	09/22/14	--	46.39	--	3841.86
	3888.25	12/10/14	--	46.09	--	3842.16
	3888.25	03/11/15	--	46.23	--	3842.02
	3888.25	06/10/15	--	46.32	--	3841.93
	3888.25	09/02/15	--	46.48	--	3841.77
	3888.25	12/09/15	--	46.57	--	3841.68
	3888.25	03/09/16	--	46.62	--	3841.63
	3888.25	06/28/16	--	46.74	--	3841.51
	3888.25	09/21/16	--	46.81	--	3841.44
	3888.25	12/07/16	--	46.90	--	3841.35
	3888.25	03/08/17	--	46.93	--	3841.32
	3888.25	06/06/17	--	47.08	--	3841.17
	3888.25	09/08/17	--	47.12	--	3841.13
	3888.25	12/04/17	--	47.21	--	3841.04
	3888.25	03/05/18	--	47.30	--	3840.95
	3888.25	06/05/18	--	47.36	--	3840.89
	3888.25	09/05/18	--	47.43	--	3840.82
	3888.25	12/11/18	--	47.52	--	3840.73
	3888.25	03/06/19	--	47.60	--	3840.65

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-7	3889.23	06/03/14	--	45.94	--	3843.29
	3889.23	09/22/14	--	46.08	--	3843.15
	3889.23	12/10/14	--	45.70	--	3843.53
	3889.23	03/11/15	--	45.36	--	3843.87
	3889.23	06/10/15	--	46.08	--	3843.15
	3889.23	09/02/15	--	46.14	--	3843.09
	3889.23	12/09/15	--	46.24	--	3842.99
	3889.23	03/09/16	--	46.30	--	3842.93
	3889.23	06/28/16	--	46.42	--	3842.81
	3889.23	09/21/16	--	46.52	--	3842.71
	3889.23	12/07/16	--	46.59	--	3842.64
	3889.23	03/08/17	--	46.65	--	3842.58
	3889.23	06/06/17	--	46.73	--	3842.50
	3889.23	09/08/17	--	46.80	--	3842.43
	3889.23	12/04/17	--	46.88	--	3842.35
	3889.23	03/05/18	--	46.96	--	3842.27
	3889.23	06/05/18	--	47.04	--	3842.19
	3889.23	09/05/18	--	47.11	--	3842.12
	3889.23	12/11/18	--	47.20	--	3842.03
	3889.23	03/06/19	--	47.27	--	3841.96
MW-8	3887.06	06/03/14	--	44.94	--	3842.12
	3887.06	09/22/14	--	45.11	--	3841.95
	3887.06	12/10/14	--	44.79	--	3842.27
	3887.06	03/11/15	--	44.94	--	3842.12
	3887.06	06/10/15	--	45.22	--	3841.84
	3887.06	09/02/15	--	45.21	--	3841.85
	3887.06	12/09/15	--	45.29	--	3841.77
	3887.06	03/09/16	--	45.35	--	3841.71
	3887.06	06/28/16	--	45.56	--	3841.50
	3887.06	09/21/16	--	45.67	--	3841.39
	3887.06	12/07/16	--	45.64	--	3841.42
	3887.06	03/08/17	--	45.68	--	3841.38
	3887.06	06/06/17	--	45.78	--	3841.28
	3887.06	09/08/17	--	45.82	--	3841.24
	3887.06	12/04/17	--	45.91	--	3841.15
	3887.06	03/05/18	--	46.03	--	3841.03
	3887.06	06/05/18	--	46.12	--	3840.94
	3887.06	09/05/18	--	46.16	--	3840.90
	3887.06	12/11/18	--	46.26	--	3840.80
	3887.06	03/06/19	--	46.33	--	3840.73

Notes:
1. TOC : Measured from top of casing.
2. LNAPL : Light non aqueous phase liquid.
3. -- : Denotes Not Measured.
4. AMSL : Denotes above mean sea level (AMSL)

Table 4 : Summary of Laboratory Analytical Results for Groundwater Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

	Chloride (mg/L)															
	June 2014	Sept. 2014	Dec. 2014	March 2015	June 2015	Sept. 2015	Dec. 2015	March 2016	June 2016	Sept. 2016	Dec. 2016	March 2017	June 2017	Sept. 2017	Dec. 2017	March 2018
MW-1R	---	51.4	116	39.0	24.6	21.6	23.5	34.8	24.9	28.5	44.8	32.0	28.6	29.3	29.0	33.7
MW-2	17.7	17.4	18.3	16.6	16.8	16.6	15.4 *	13.5	18.9	17.6	18.2	15.0	15.9	15.2	16.2	16.6
MW-3	59.7	59.7	58.9	57.0	57.1	56.3	50.5 *	49.3	51.5	52.0	55.1	50.0	53.7	49.5	58.1	64.3
MW-4	**586**	**534**	**535**	**543**	**556**	**567**	**546 ***	**525**	**527**	**569**	**605**	**500**	**493**	**465**	**492**	**484**
MW-5	28.6	27.3	27.9	26.1	26.2	25.8	22.4 *	22.4	26.1	26.2	27.8	23.1	24.7	20.4	25.4	25.9
MW-6	**282**	**263**	**268**	**261**	**253**	**277**	197 *	150	128	128	125	94.4	86.3	79.3	71.8	64.7
MW-7	42.7	29.6	36.0	39.7	36.2	35.2	28.8 *	27.7	36.0	38.2	39.6	24.2	23.8	24.0	27.7	31.6
MW-8	**409**	**442**	**463**	**485**	**558**	**327**	**499**	**504**	**539**	**490**	**768**	**489**	**531**	**573**	**570**	**587**

Notes:

1. mg/L : milligrams per liter.
2. < : Analyte not detected at the laboratory reporting limit.
3. All analyses performed by TestAmerica Laboratories in Nashville, Tennessee.
4. Cells shaded in blue indicate results that are above the laboratory reporting limit.
5. Cells with text **bolded** indicate results that exceed the New Mexico Administrative Code 20.6.2.3103, Standards for Groundwater: chloride (250.0 mg/L).
6. --- : Analysis not performed.
7. * : Analysis performed outside of holding time.
8. December 2016 results for MW-1R and MW-8 were confirmed by laboratory. reanalysis.
9. Sample MW-1R was collected in December 2017 under sample ID MW-R1 as shown on the COC and in the field book.

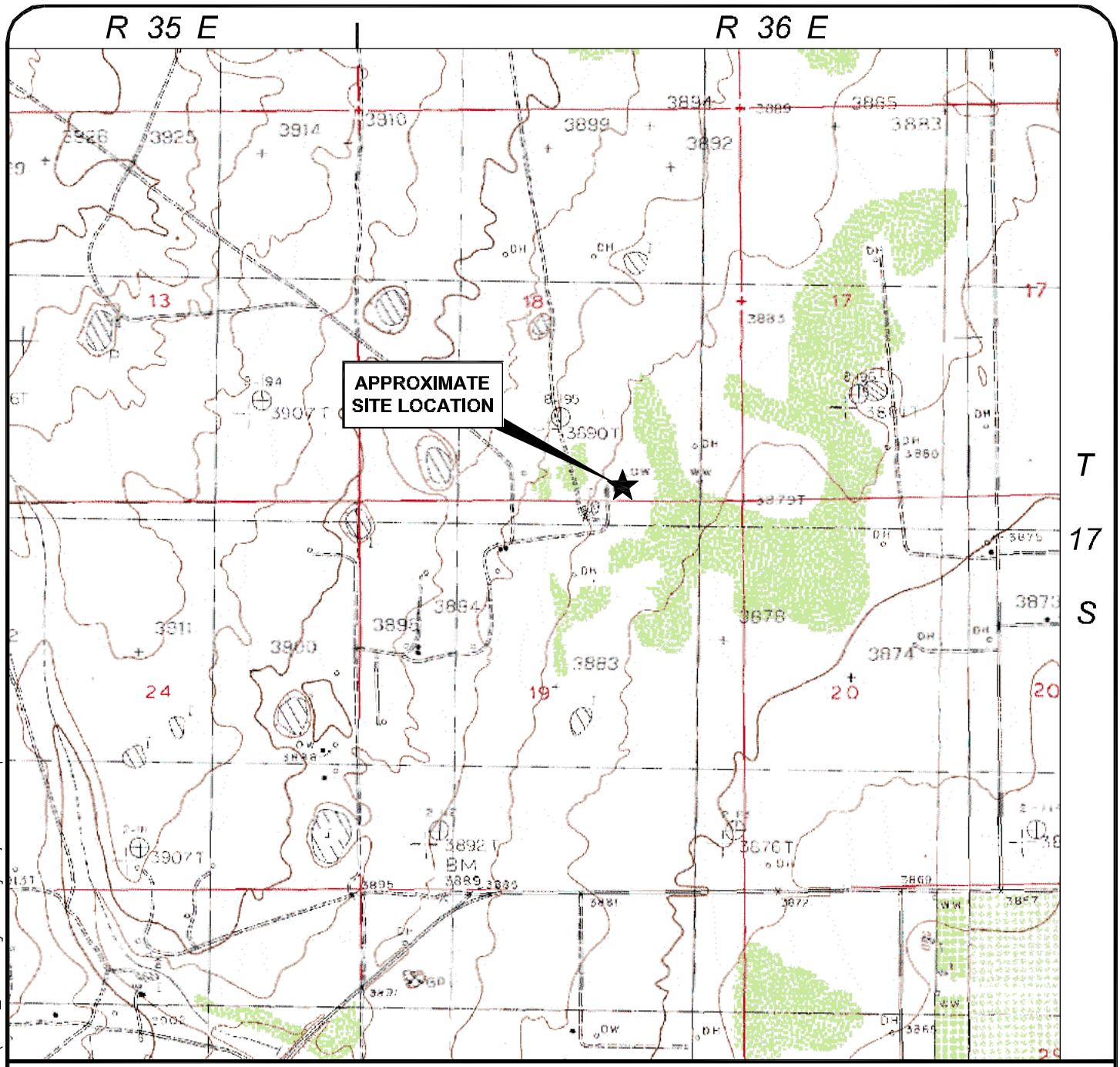
Table 4 : Summary of Laboratory Analytical Results for Groundwater Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

	Chloride (mg/L)			
	June 2018	Sept. 2018	Dec. 2018	March 2019
MW-1R	---	---	---	---
MW-2	---	---	---	---
MW-3	---	---	---	---
MW-4	**413**	**387**	**373**	**617**
MW-5	---	---	---	---
MW-6	---	---	---	---
MW-7	---	---	---	---
MW-8	**539**	**398**	**474**	**308**

Notes:

1. mg/L : milligrams per liter.
2. < : Analyte not detected at the laboratory reporting limit.
3. All analyses performed by TestAmerica Laboratories in Nashville, Tennessee.
4. Cells shaded in blue indicate results that are above the laboratory reporting limit.
5. Cells with text bolded indicate results that exceed the New Mexico Administrative Code 20.6.2.3103, Standards for Groundwater: chloride (250.0 mg/L).
6. --- : Analysis not performed.
7. * : Analysis performed outside of holding time.
8. December 2016 results for MW-1R and MW-8 were confirmed by laboratory. reanalysis.
9. Sample MW-1R was collected in December 2017 under sample ID MW-R1 as shown on the COC and in the field book.

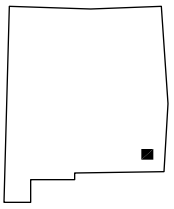
FIGURES



SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES
LOVINGTON SW, NEW MEXICO - PROVISIONAL EDITION 1985 AND
LOVINGTON SE, NEW MEXICO - PROVISIONAL EDITION 1985

SCALE
0 1/2 1 MILE

NEW MEXICO



N

CLIENT CHESAPEAKE ENERGY CORPORATION, LLC OKLAHOMA CITY, OKLAHOMA	FIGURE TITLE ***SITE LOCATION AND TOPOGRAPHIC FEATURES***
LOCATION STATE M LEASE (AP-72) SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO	DOCUMENT TITLE FIFTH ANNUAL GROUNDWATER MONITORING REPORT

Equus Environmental, LLC
1323 East 71st Street, Suite 200
Tulsa, Oklahoma 74136-5065
918.921.5331
www.EQUUSENV.com

		DESIGNED BY	MNM
DATE	5/20/2019	APPROVED BY	MNM
SCALE	AS SHOWN	DRAWN BY	SKG
PROJECT NUMBER		FIGURE NUMBER	
CHKSTATM:H18001		1	

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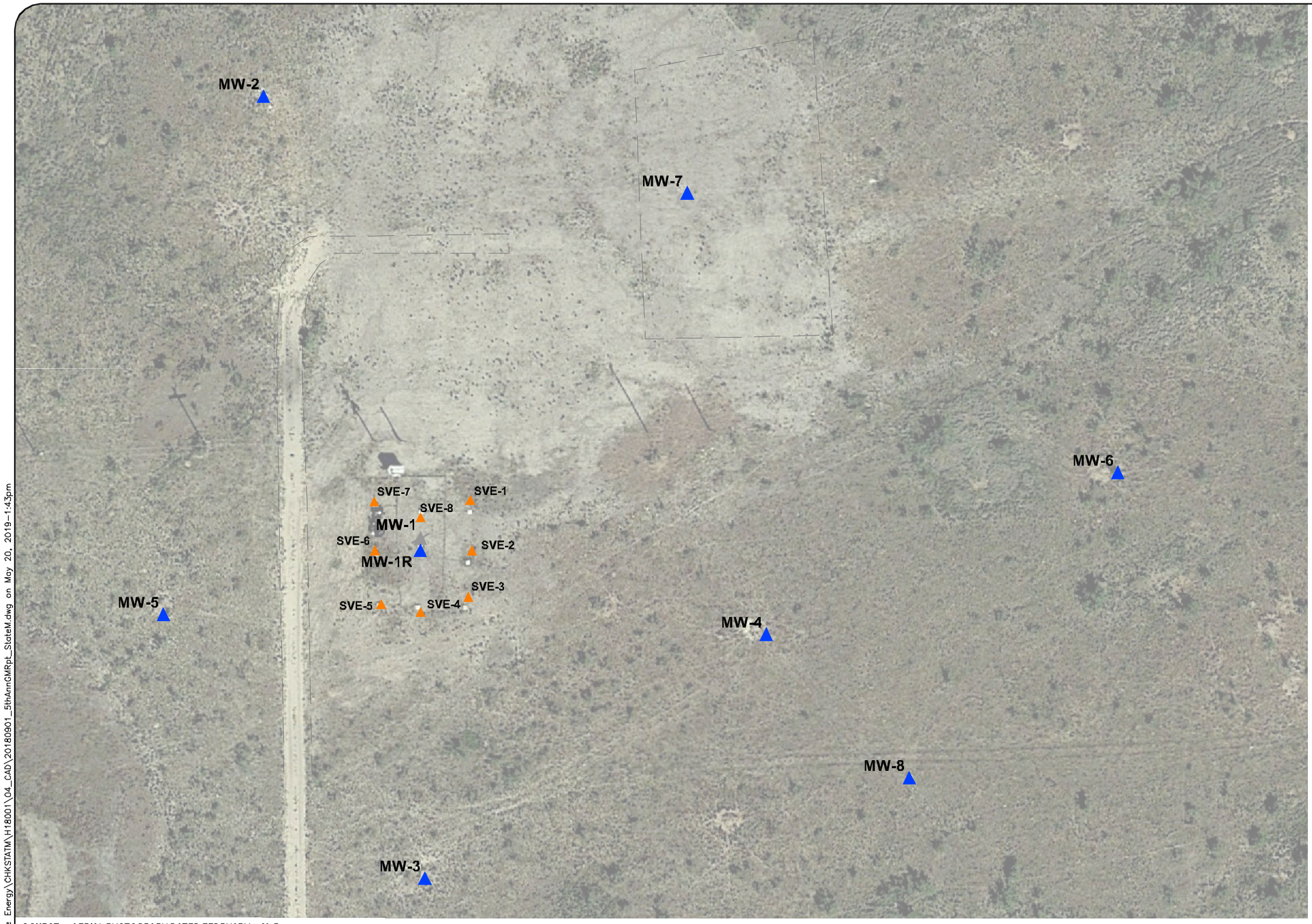

LEGEND

- MW-5 — LOCATION OF MONITORING WELL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- SVE-1 — LOCATION OF SVE SYSTEM WELL

N

30 0 30 60
SCALE FEET

SOURCE: AERIAL PHOTOGRAPH DATED FEBRUARY 1, 2017, GOOGLE EARTH PRO SCREEN CAPTURE

H:\PROJECTS\Chesapeake Energy\CHKSTATM\H18001\04_CAD\20180901_5thAnnGMRpt_StateM.dwg on May 20, 2019 - 1:43pm

EQUUS
1323 East 71st Street, Suite 200
Tulsa, Oklahoma 74136-5065
918.921.5331
www.EQUUSENV.com

DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***SITE BASE MAP***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
CHKSTATM:H18001	2

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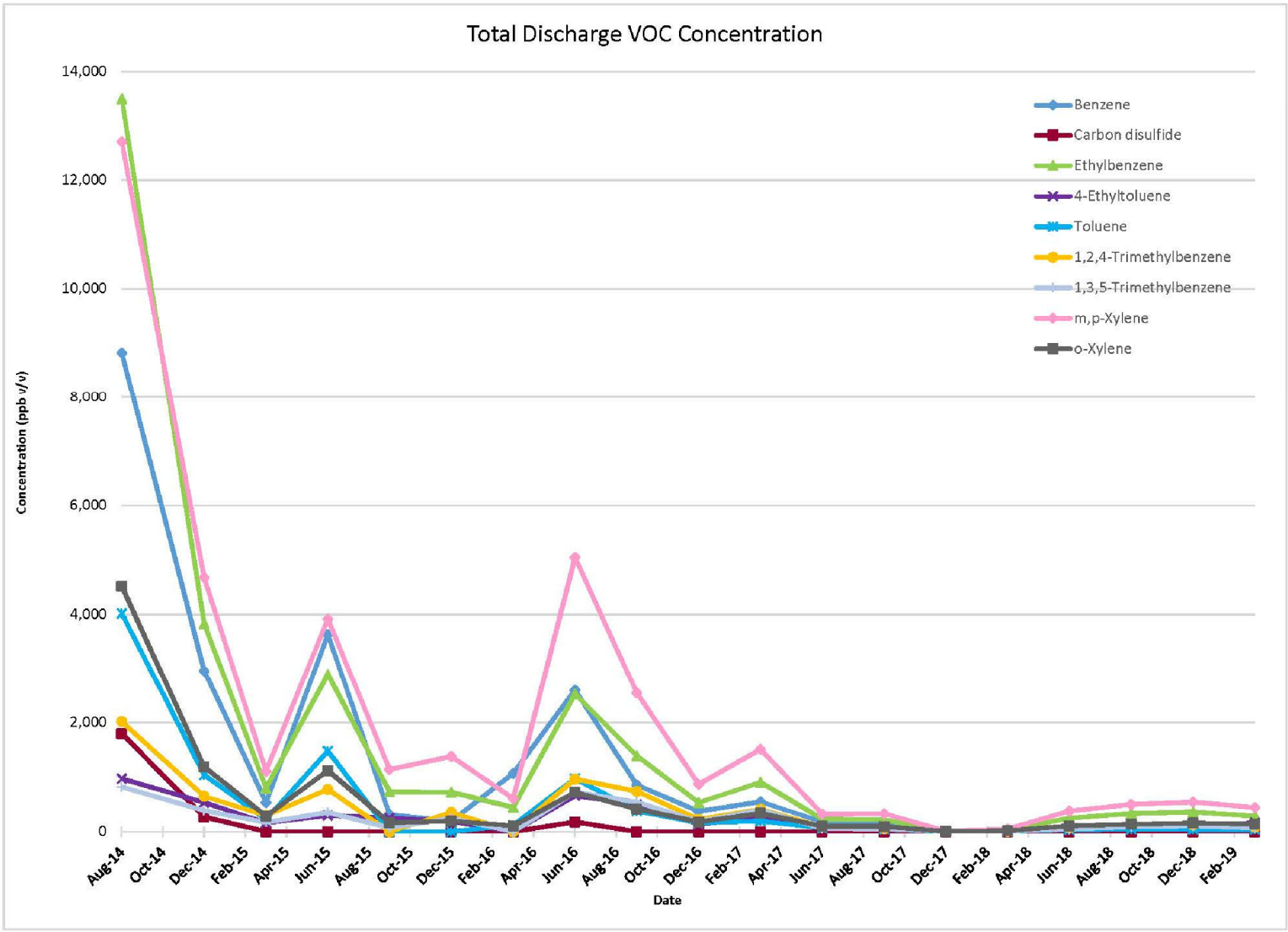

EQUUS Environmental, LLC
1323 East 71st Street, Suite 200
Tulsa, Oklahoma 74136-5065
918.921.5331
www.EQUUSENV.com

DOCUMENT TITLE
FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE
SVE SYSTEM VOC DISCHARGE CONCENTRATIONS VERSUS TIME

CLIENT CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	JEC		
APPROVED BY	MNM	SCALE	NTS
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
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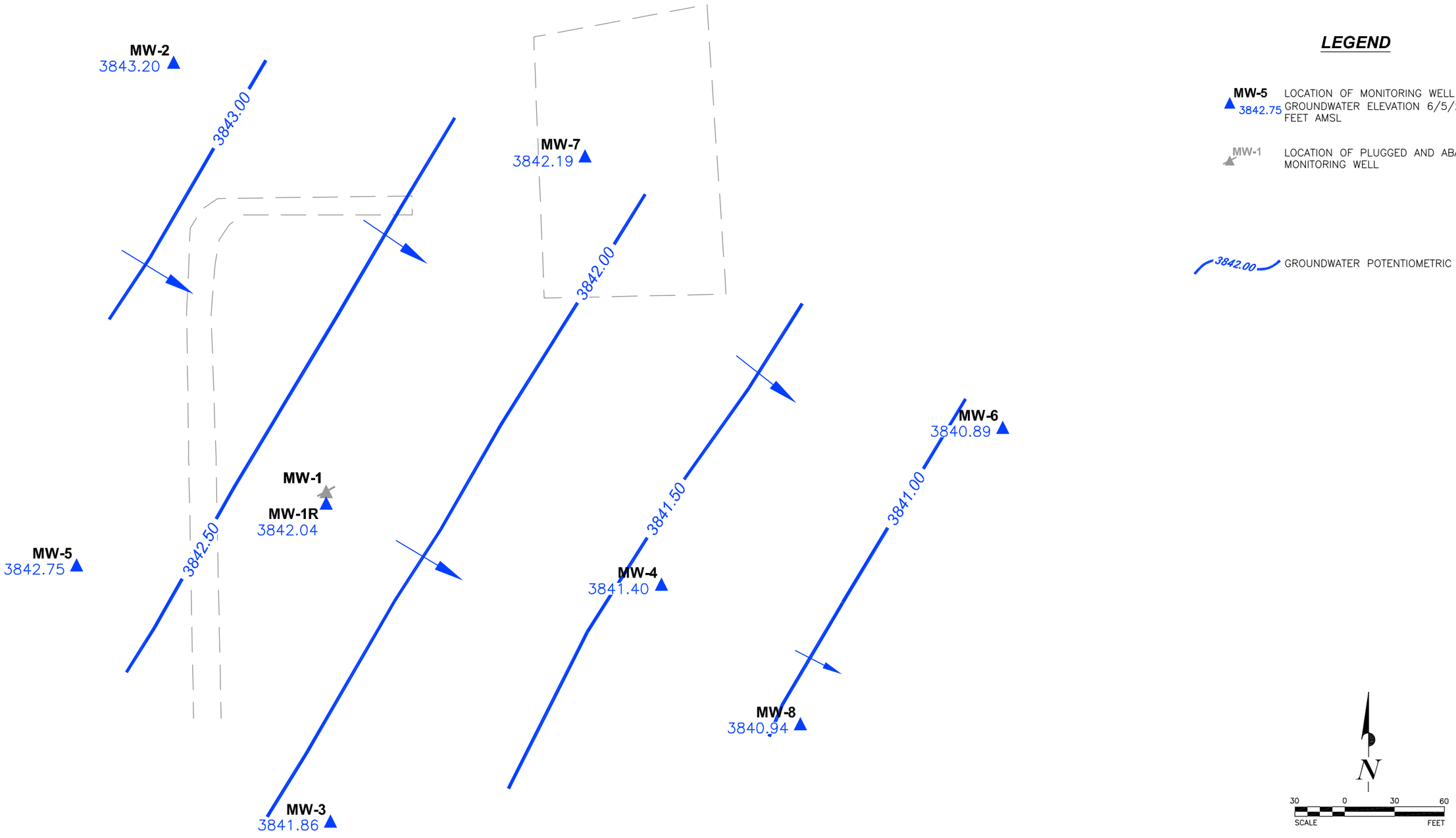

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DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, JUNE 5, 2018***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
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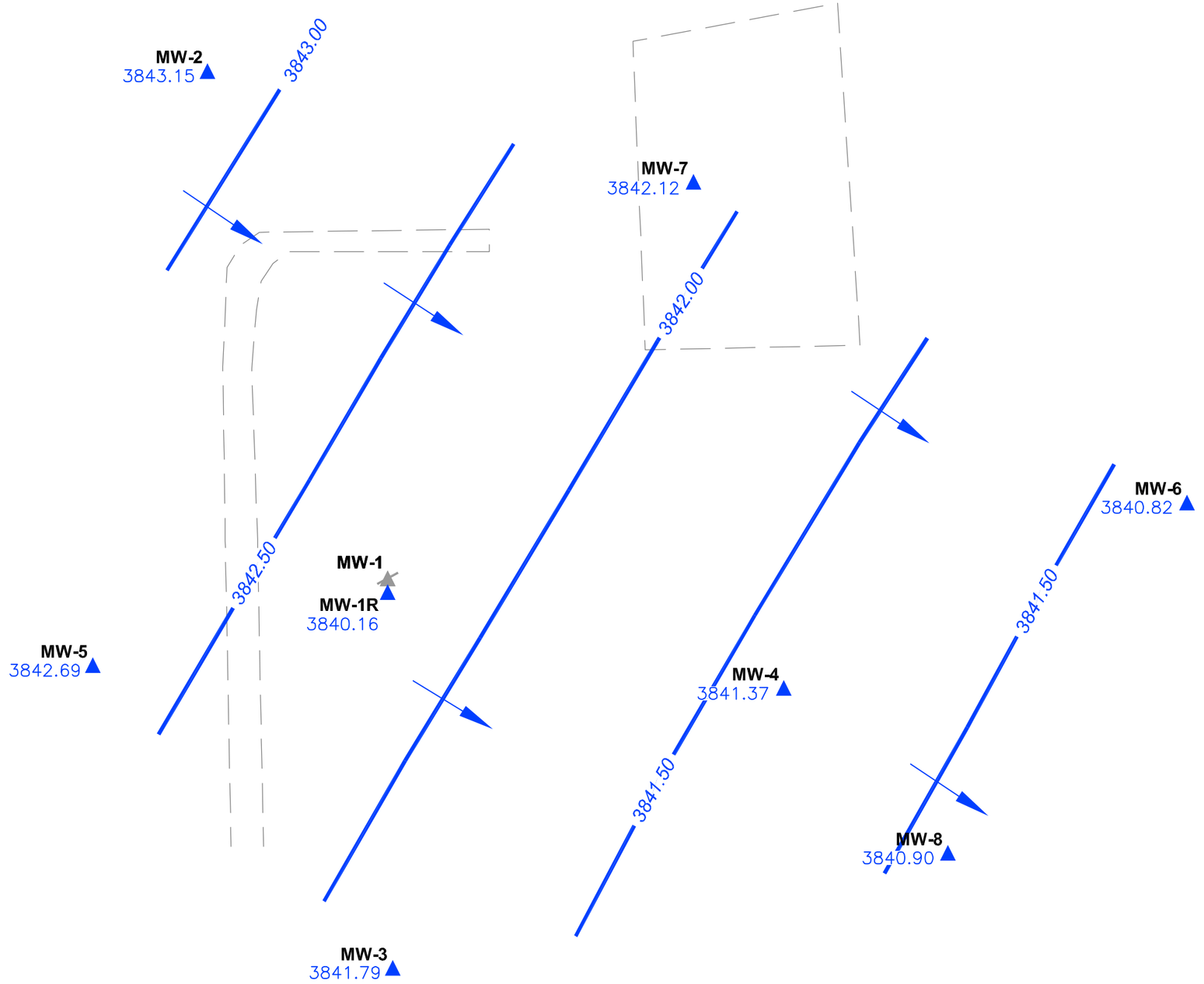

LEGEND

MW-5 3842.69 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 9/5/2018, FEET AMSL

MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL

3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

N

30 0 30 60
SCALE FEET

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Tulsa, Oklahoma 74136-5065
918.921.5331
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DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, SEPTEMBER 5, 2018***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
CHKSTATM:H18001	5

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LEGEND

- **MW-5** 3842.61 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 12/11/2018, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

N

30 0 30 60
SCALE FEET

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DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, DECEMBER 11, 2018***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
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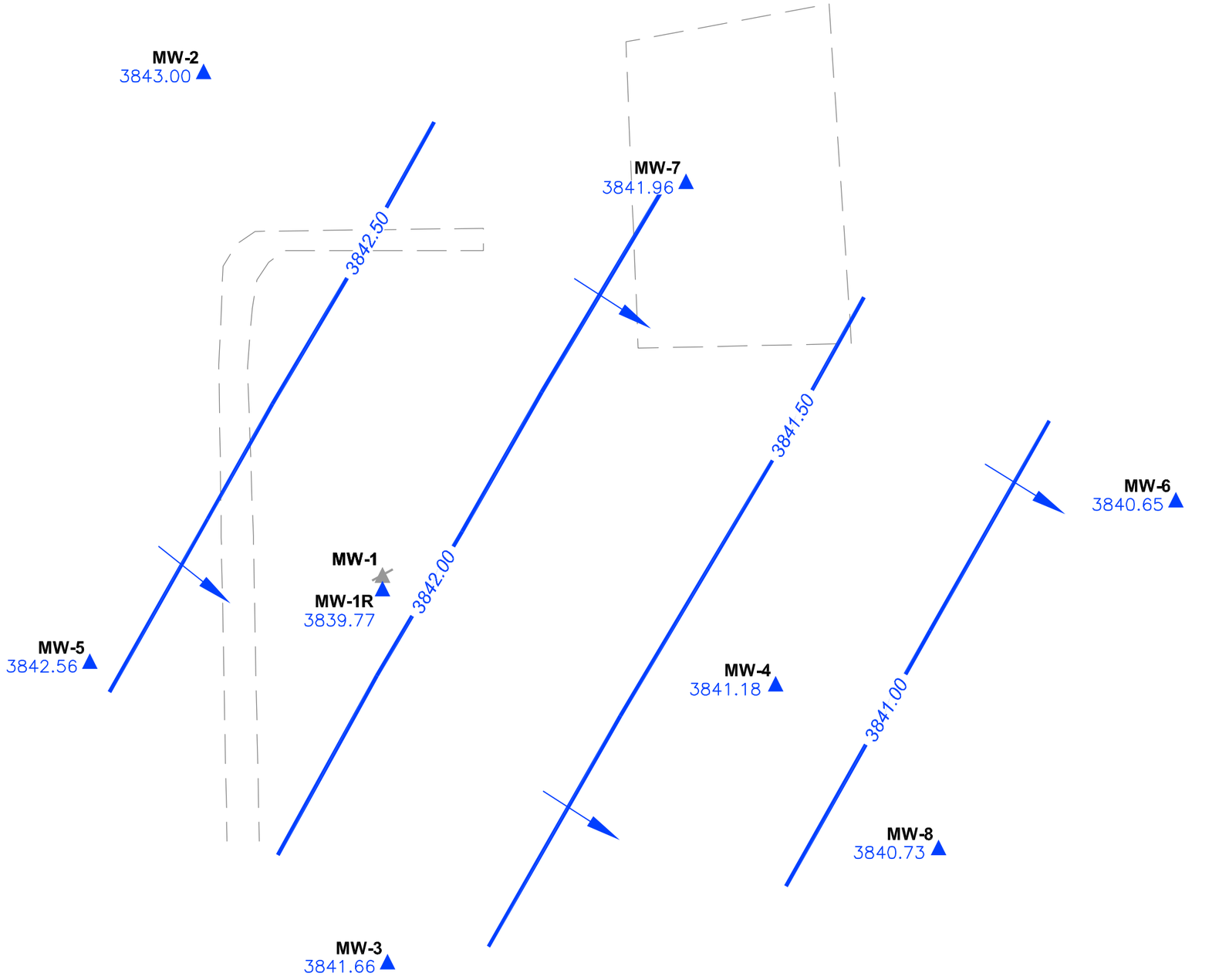

LEGEND

MW-5 3842.87 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 3/6/2019, FEET AMSL

MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL

3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

N

30 0 30 60
SCALE FEET

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DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, MARCH 6, 2019***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
CHKSTATM:H18001	7

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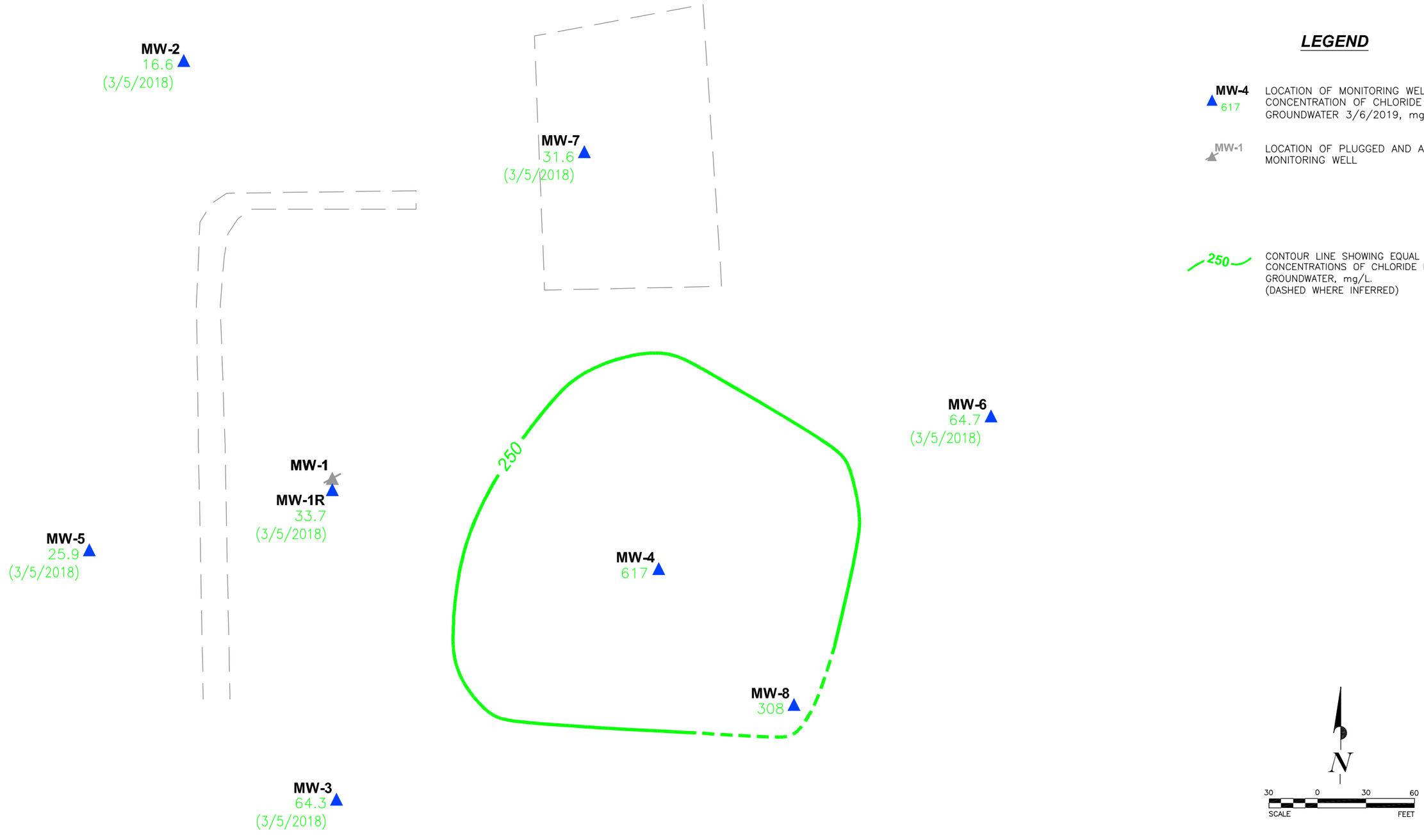

LEGEND

- MW-4 / 617 — LOCATION OF MONITORING WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER 3/6/2019, mg/L
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 250 — CONTOUR LINE SHOWING EQUAL CONCENTRATIONS OF CHLORIDE IN GROUNDWATER, mg/L. (DASHED WHERE INFERRED)

EQUUS Environmental, LLC
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www.EQUUSENV.com

DOCUMENT TITLE: FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: *ISOPLETH OF CHLORIDE CONCENTRATIONS IN GROUNDWATER, MARCH 6, 2019*

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM		
APPROVED BY	MNM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
CHKSTATM:H18001	8

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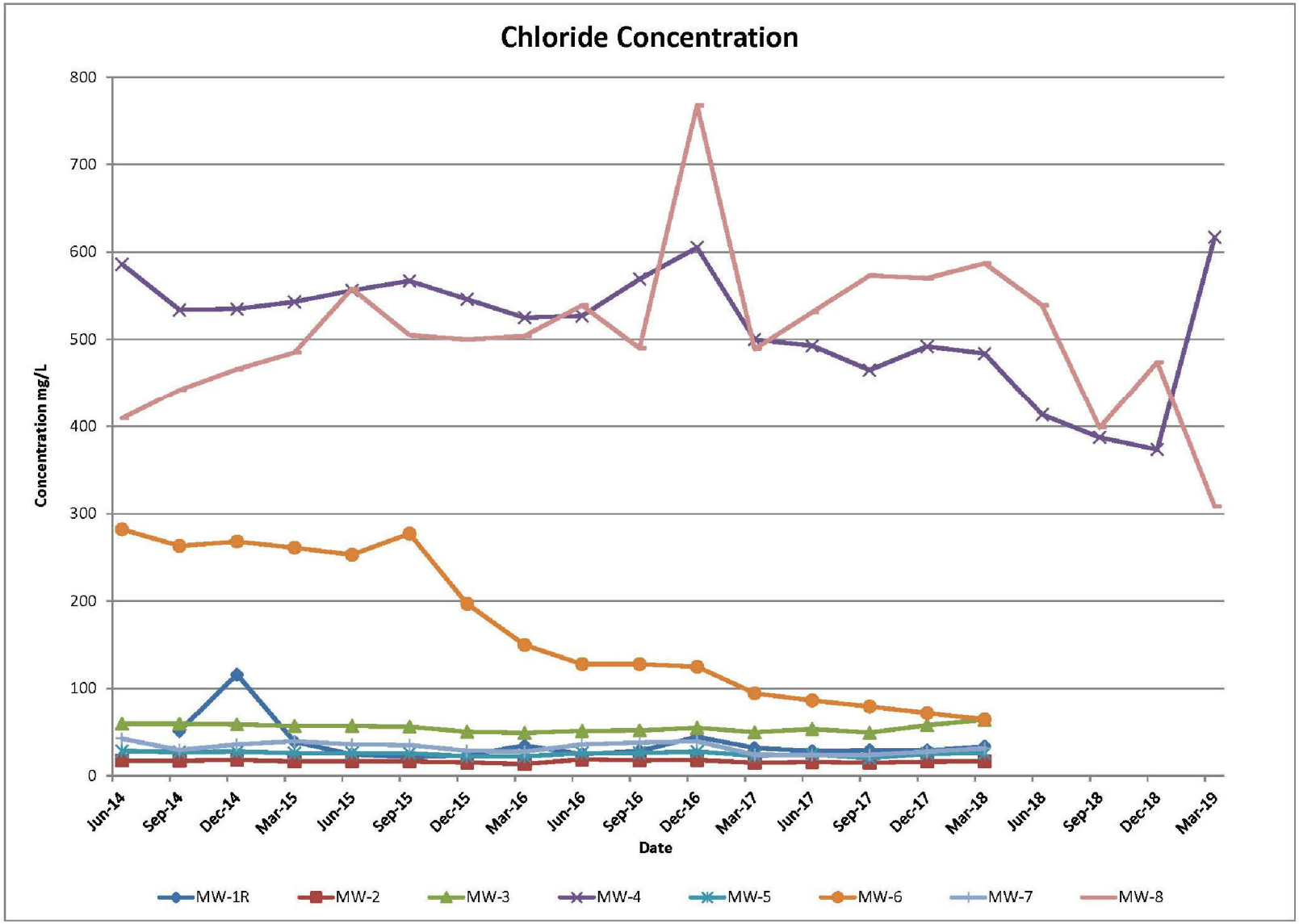

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DOCUMENT TITLE
FIFTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE
CHLORIDE CONCENTRATION TREND GRAPHS

CLIENT
CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION
STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	CNA		
APPROVED BY	MNM	SCALE	NTS
DRAWN BY	SKG	DATE	5/20/2019

PROJECT NUMBER	FIGURE NUMBER
CHKSTATM:H18001	9

APPENDICES

A Stage 2 Abatement Plan

B NMOCD Approval of Stage 2 Abatement Plan

C Laboratory Analytical Reports and Chain-of-Custody Documentation

APPENDIX A

STAGE 2 ABATEMENT PLAN

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401
www.arcadis-us.com

ENVIRONMENT

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject:
State M-1 AP-072
Stage 2 Abatement Plan

Date:
March 27, 2012

Contact:
Sharon Hall

Phone:
432 687-5400

Email:
shall@aracdis-us.com

Our ref:
MT001088

ARCADIS U.S., Inc.
TX Engineering License # F-533

Dear Mr. Von Gonten:

On behalf of Chesapeake Energy Corporation, ARCCADIS U.S. Inc. respectfully submits the enclosed Stage 2 Abatement plan for the State M-1 site (AP-072). A Stage 1 Abatement Plan Report was submitted on March 20, 2012. Your review and approval of this Abatement Plan will be appreciated. The landowner, Darr Angell, is anxious for us to complete soil remediation at this site.

If you have any questions please do not hesitate to contact Bradley Blevins at (575) 391-1462 or via e-mail at bblevins@chkenergy or me at (432) 687-5400, e-mail address shall@aracdis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Sharon E. Hall

Sharon E. Hall
Associate Vice President

Copies:
Bradley Blevins- Chesapeake, Hobbs

Imagine the result

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Chesapeake Energy Corporation

State M-1 AP-072
Stage 2 Abatement
Plan Proposal

Hobbs, New Mexico

March 27, 2012

ARCADIS

Sharon Hall
Associate Vice President

State M-1 AP-072

Stage 2 Abatement
Plan Proposal

Prepared for:
Chesapeake Energy
Corporation
Hobbs, New Mexico

Prepared by:
ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401

Our Ref.:
MT001088.0001.00001

Date:
March 27, 2012

Table of Contents

Figures

Appendices

ARCADIS

1. INTRODUCTION

The subject site is a former tank battery site located east of Buckeye, New Mexico. The site was purchased by Chesapeake Energy Corporation (Chesapeake) in April 2004. Chesapeake did not operate the tank battery or the associated well field and began the process of facility abandonment in 2007.

Seven monitor wells and nine soil borings have been drilled at the site. Elevated chloride concentrations and limited hydrocarbon compounds were detected in soil samples collected from soil borings and monitoring wells. Elevated chlorides were detected in the down gradient monitor wells and light non-aqueous phase liquid (LNAPL) occurs in monitoring well MW-1. LNAPL recovery activities have been piloted at the site and will commence again upon completion of surface reclamation activities.

2. SUMMARY OF STAGE 1 ABATEMENT ACTIVITIES

Initial site investigation activities were conducted in May of 2007 following abandonment of the tank battery. Stage 1 Abatement activities were conducted during the period of May 2007 through September 2011. Stage 1 Abatement activities included drilling and soil sampling of nine boreholes, drilling and sampling of seven monitor wells, EM 31 and EM 34 surveys, conversion of one monitoring well into a recovery well and recovery of phase-separated hydrocarbons from the recovery well.

New Mexico Oil Conservation Division (NMOCD) was notified of impacts to groundwater at the site via e-mail on May 30, 2007. NMOCD notified Chesapeake in a letter dated June 19, 2007 that a Stage 1 Abatement Plan was required for the site in accordance with Rule 19.

The Stage 1 Abatement Plan was submitted to NMOCD on August 22, 2007. The plan summarized site activities taken to date. The plan proposed the drilling and sampling of a minimum of three additional soil borings and installation and sampling of nine groundwater monitoring wells.

BBC contacted NMOCD via email on April 24, 2010 to inquire about the status of the Stage 1 Abatement Plan approval and Chesapeake's desire to conduct the proposed Stage 1 Abatement Plan activities. On May 27, 2010, NMOCD responded via email that the State was not staffed to review the Abatement Plans (APs) in a timely manner. On June 23, 2010, BBC contacted NMOCD via email to request a waiver of the Public Notice requirement and inform NMOCD that Chesapeake and the landowner were

anxious to move forward with the proposed AP activities. NMOCD replied via email on June 23, 2010 stating they were still understaffed to review the AP and could not waive the Public Notice requirement. They advised BBC that Chesapeake could proceed "at risk." On July 12, 2010 BBC informed NMOCD by registered letter that Chesapeake was planning to start the Stage 1 Assessment on or about August 23, 2010. They further informed NMOCD they would be submitting the required Public Notices, a copy of which was attached to the letter. NMOCD did not respond to the registered letter.

The public notices were published in the Hobbs News-Sun and Lovington Leader on July 22, 2010 and the Albuquerque Journal on July 24, 2010. No comments were received from the public or NMOCD during the 30-day comment period and Chesapeake proceeded with the proposed Stage 1 Abatement Plan activities on August 26, 2010. Copies of correspondence and Public Notice are included in Appendix A.

A detailed description of site activities and results can be found in the report submitted to NMOCD dated March 20, 2012 entitled State M-1 AP-072, Stage 1 Abatement Report (Site Assessment Investigation). Analytical results for soil and groundwater sampling are summarized on Figure 1.

3. STAGE 2 ABATEMENT PLAN PROPOSAL

After review of various remedial options, we propose the following Stage 2 Abatement Plan. The plan addresses soil and groundwater remediation.

3.1 Soil Remediation

The selected remedial option will be the excavation of near-surface soils and installation of clay liners. The anticipated extent and depth of excavation is based on assessment activities (laboratory analysis and visual observation) and is shown in Figure 2. Near surface soils (to a depth of 5 feet below ground surface) with chloride concentrations in excess of 1,000 milligrams per kilogram (mg/kg) and a Total Petroleum Hydrocarbons (TPH) concentration in excess of 1,000 mg/kg will be excavated and disposed. Excavated soils will be disposed at Lea Land Landfill.

Areas where chloride or TPH concentrations are expected to exceed 1,000 mg/kg at depths greater than 5 feet below ground surface soils will be excavated to a depth of 5

feet below ground surface. Soils will be screened in the field for chlorides using chloride field test kits and for TPH using a photoionization. Critical samples (samples used to delineate the excavations) will be submitted for laboratory analysis of chlorides and/or TPH. Following excavation, a 12-inch compacted clay layer that meets or exceeds a permeability of equal to or less than 1×10^{-8} centimeters per second will be installed in the excavations. The lined excavations will be backfilled with four feet of locally obtained native soil. All of the excavated areas will be re-seeded with native vegetation. Areas that are supporting vegetation will not be disturbed.

Use of the USEPA Multi-Med model demonstrates that the clay liners will mitigate the leaching of chlorides to groundwater. The model predicts that after 7000 years of infiltration through the liner the maximum concentration of chlorides in groundwater will be 221.8 milligrams per liter (mg/L). The Multi-Med inputs and outputs are included in Appendix A.

3.2 Groundwater Remediation and Monitoring

One additional groundwater monitoring well will be installed downgradient of the site. The monitoring well will be designated MW-8.

Groundwater samples will be collected from all of the monitoring wells and analyzed for chlorides using USEPA method 9056 for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling will be discontinued when eight quarters of sample results indicate chloride concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to the NMOCD annually on June 15.

Following removal of LNAPL from MW-1, groundwater samples will be collected from MW-1 and analyzed for benzene, toluene ethylbenzene and xylenes (BTEX) using USEPA method 8260B for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling of MW-1 for BTEX will be discontinued when eight quarters of sample results indicate BTEX concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to

the NMOCD annually on June 15. Proposed groundwater remediation is presented in Sections 3.2.1 and 3.2.2.

3.2.1 Chlorides

Chloride concentrations in groundwater exceed New Mexico Water Quality Control Commission standards in two wells (MW-1 411mg/L and MW-4 472mg/L).

Removal of near-surface soils that are a potential source of chlorides and BTEX in groundwater and lining of excavations with chloride and TPH concentrations in excess of 1,000 mg/kg will mitigate leaching of chlorides to groundwater. Considering the relatively low concentrations of chlorides in groundwater and the fact that soil removal and clay liner infiltration barrier installation will be conducted at this site, we propose monitoring the site for a period of two years before considering pumping of groundwater at this site. With the proposed source removal and mitigation and the severe drought conditions being experienced in this area, we believe it prudent to evaluate if chloride mass removal by pumping is warranted at this site.

3.2.2 Hydrocarbons

A pilot LNAPL recovery test will take place over a three week period and will be used to develop long-term recovery procedures. LNAPL will be recovered from MW-1 and disposed in a NMOCD approved facility. Additionally, two soil vent borings equipped with wind turbines will be installed in the area near MW-1.

4. PUBLIC NOTIFICATION

Written notification of submittal of the Stage 2 Abatement Plan Proposal and site activities will be sent to all surface owners of record within a one-mile radius of the site. NMOCD will be supplied with a list of parties to be notified. Publication of notice of activities will be published in a state-wide circulated newspaper, the Albuquerque Journal, and two county newspapers, the Hobbs-Daily News Sun and the Lovington Leader.

5. REMEDIATION WORK SCHEDULE

Soil remediation activities are expected to be completed in 15 working days (Monday through Friday). Groundwater remediation activities will be ongoing. An estimated completion date for groundwater remediation is not available.

6. REFERENCES

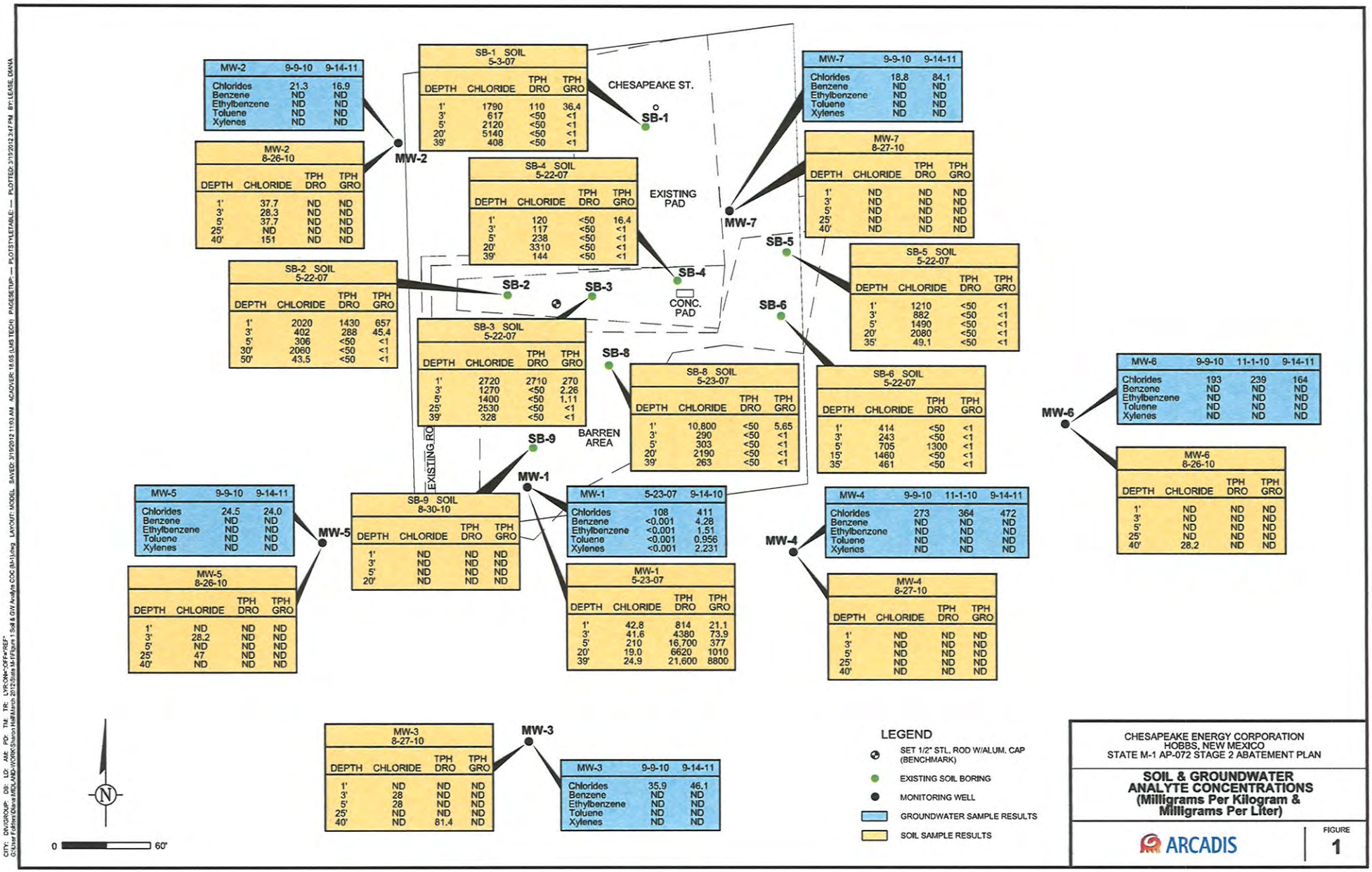
Groundwater Handbook; United States Environmental Protection Agency, Office of Research and Development, Center for Environmental Research Information; 1992

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I

State M-1 AP-072 Stage 1 Abatement Report (Site Assessment Investigation); ARCADIS; March 2012

State M-1Salt Water Disposal Tank Battery, Stage 1 Abatement Plan (Ap-072), BBC International; August 2007

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I



MW-2	9-9-10	9-14-11
Chlorides	21.3	16.9
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-2 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	37.7	ND	ND
3'	28.3	ND	ND
5'	37.7	ND	ND
25'	ND	ND	ND
40'	151	ND	ND

SB-1 SOIL 5-3-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	1790	110	36.4
3'	617	<50	<1
5'	2120	<50	<1
20'	5140	<50	<1
39'	408	<50	<1

SB-4 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	120	<50	16.4
3'	117	<50	<1
5'	238	<50	<1
20'	3310	<50	<1
39'	144	<50	<1

SB-2 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	2020	1430	657
3'	402	288	45.4
5'	306	<50	<1
30'	2060	<50	<1
50'	43.5	<50	<1

SB-3 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	2720	2710	270
3'	1270	<50	2.26
5'	1400	<50	1.11
25'	2530	<50	<1
39'	328	<50	<1

MW-7	9-9-10	9-14-11
Chlorides	18.8	84.1
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-7 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	ND	ND	ND

SB-5 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	1210	<50	<1
3'	882	<50	<1
5'	1490	<50	<1
20'	2080	<50	<1
35'	49.1	<50	<1

SB-8 SOIL 5-23-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	10,800	<50	5.65
3'	290	<50	<1
5'	303	<50	<1
20'	2190	<50	<1
39'	263	<50	<1

SB-6 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	414	<50	<1
3'	243	<50	<1
5'	705	1300	<1
15'	1460	<50	<1
35'	461	<50	<1

MW-6	9-9-10	11-1-10	9-14-11
Chlorides	193	239	164
Benzene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
Xylenes	ND	ND	ND

MW-6 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	28.2	ND	ND

MW-5	9-9-10	9-14-11
Chlorides	24.5	24.0
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-5 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	28.2	ND	ND
5'	ND	ND	ND
25'	47	ND	ND
40'	ND	ND	ND

SB-9 SOIL 8-30-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
20'	ND	ND	ND

MW-1	5-23-07	9-14-10
Chlorides	108	411
Benzene	<0.001	4.28
Ethylbenzene	<0.001	1.51
Toluene	<0.001	0.956
Xylenes	<0.001	2.231

MW-1 5-23-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	42.8	814	21.1
3'	41.6	4380	73.9
5'	210	16,700	377
20'	19.0	6620	1010
39'	24.9	21,600	8800

MW-4	9-9-10	11-1-10	9-14-11
Chlorides	273	364	472
Benzene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
Xylenes	ND	ND	ND

MW-4 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	ND	ND	ND

MW-3 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	28	ND	ND
5'	28	ND	ND
25'	ND	ND	ND
40'	ND	81.4	ND

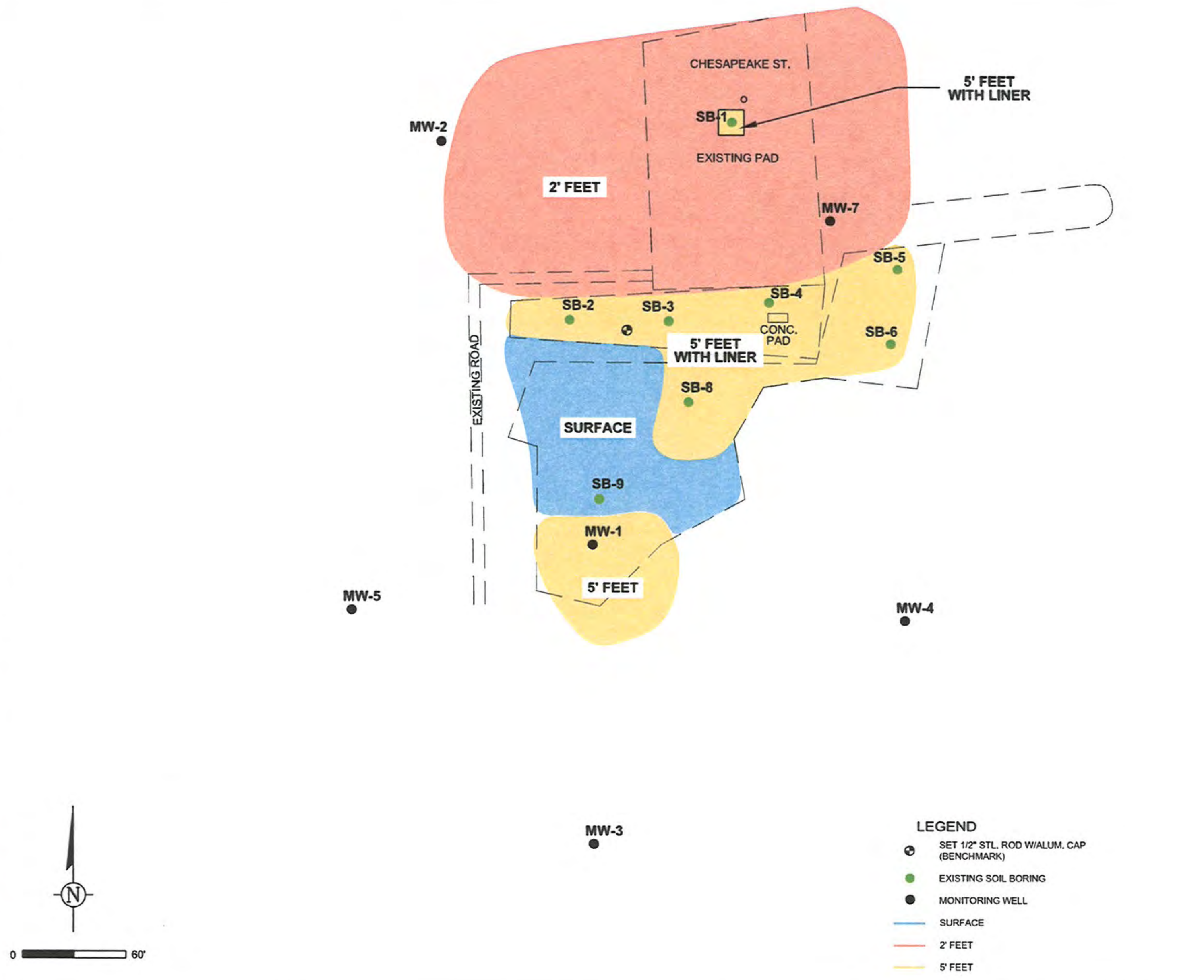
MW-3	9-9-10	9-14-11
Chlorides	35.9	46.1
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

SOIL & GROUNDWATER ANALYTE CONCENTRATIONS (Milligrams Per Kilogram & Milligrams Per Liter)

ARCADIS

FIGURE 1



CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

PROPOSED EXCAVATION MAP

ARCADIS

FIGURE 2

ARCADIS

Appendix A

Multi-Med Model Inputs and Outputs

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico
Multimed Model Input and Output (With Liner)

MODEL INPUT AND OUTPUT						MODEL RANGE	
INPUT PARAMETERS						Minimum	Maximum
Unsaturated Zone Flow Parameters							
Depth of Unsaturated Zone	m	45	feet	13.7	m	0.000000001	None
Hydraulic Conductivity	cm/hr	2	ft/day	2.54	cm/hr	0.00000000001	10,000
Unsaturated Zone Porosity	fraction	0.05	fraction	0.05	fraction	0.000000001	0.99
Residual Water Content	fraction	0.01	fraction	0.010	fraction	0.000000001	1
Unsaturated Zone Transport Parameters							
Thickness of Layer	m	45	feet	13.7	m	0.000000001	None
Percent of Organic Matter	%	2.6	%	2.6	%	0	100
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Biological Decay Coefficient	1/yr	0	1/yr	0	1/yr	0	None
Aquifer Parameters							
Aquifer Porosity	fraction	0.25	fraction	0.25	fraction	0.000000001	0.99
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Aquifer Thickness	m	50	ft	15.24	m	0.000000001	100,000
Hydraulic Conductivity	m/yr	2	ft/day	223	m/yr	0.0000001	100,000,000
Hydraulic Gradient	m/m	0.007	m/m	0.007	m/m	0.00000001	None
Organic Carbon Content	fraction	0.00315	fraction	0.00315	fraction	0.000001	1
Temperature of Aquifer	°C	14.4	°C	14.4	°C	0.00000001	None
pH		6.2		6.2		0.3	14
x-distance Radial Distance from Site to Receptor	m	1	m	1	m	1	None
Source Parameters							
Infiltration Rate from the Facility	m/yr	0.124	in/yr	0.00315	m/yr	0.0000000001	10,000,000,000
Area of Waste Disposal Unit	m^2	46,800	ft^2	4348	m^2	0.01	None
Length Scale of Facility	m	240	feet	73.2	m	0.000000001	10,000,000,000
Width Scale of Facility	m	195	feet	59.4	m	0.000000001	10,000,000,000
Recharge Rate into the Plume	m/yr	16.71	in/yr	0.4244	m/yr	0	10,000,000,000
Duration of Pulse	yr	8,000	yr	8000	yr	0.000000001	None
Initial Concentration at Landfill	mg/L	6,000	mg/L	6,000	mg/L	0	None
Additional Parameters							
Method				Gaussian		Gaussian	Patch
Name of Chemical Specified				Chloride			

MODEL OUTPUT			
Final Concentration at Landfill	mg/L	221.8	mg/L

MODEL OUTPUT				
Concentration at Landfill	0.0 mg/L	Time	1 yr
	0.0 mg/L		10 yr
	0.0 mg/L		20 yr
	18.9 mg/L		50 yr
	36.6 mg/L		70 yr
	45.4 mg/L		80 yr
	61.8 mg/L		100 yr
	123.4 mg/L		200 yr
	154.1 mg/L		300 yr
	166.3 mg/L		400 yr
	178.5 mg/L		500 yr
	190.7 mg/L		600 yr
	204.8 mg/L		800 yr
	211.1 mg/L		1,000 yr
	220.4 mg/L		2,000 yr
	221.6 mg/L		3,000 yr
	221.8 mg/L		4,000 yr
	221.8 mg/L		5,000 yr
	221.8 mg/L		6,000 yr
	221.8 mg/L		7,000 yr

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico

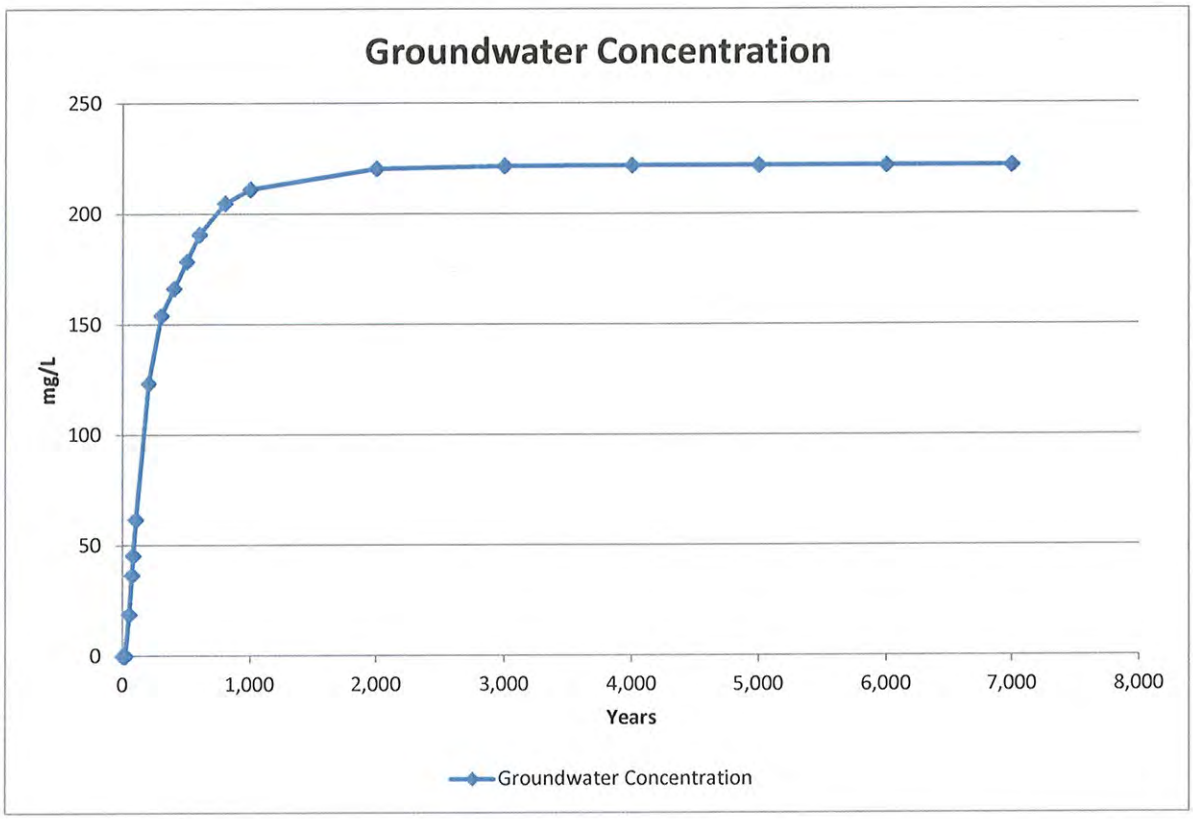


TABLE 6-3. TOTAL POROSITY OF VARIOUS MATERIALS

Material	No. of Analyses	Range	Arithmetic Mean
Igneous Rocks			
Weathered granite	8	0.34-0.57	0.45
Weathered gabbro	4	0.42-0.45	0.43
Basalt	94	0.03-0.35	0.17
Sedimentary Materials			
Sandstone	65	0.14-0.49	0.34
Siltstone	7	0.21-0.41	0.35
Sand (fine)	243	0.26-0.53	0.43
Sand (coarse)	26	0.31-0.46	0.39
Gravel (fine)	38	0.25-0.38	0.34
Gravel (coarse)	15	0.24-0.36	0.28
Silt	281	0.34-0.61	0.46
Clay	74	0.34-0.57	0.42
Limestone	74	0.07-0.56	0.3
Metamorphic Rocks			
Schist	18	0.04-0.49	0.38

Sources: From Mercer et al. (1982),
McWhorter and Sunada (1977),
Original reference Morris and Johnson, (1967).

Texture	Bulk Density g/cm^3	Average Wilting Point	Plant Available Water Inches/Ft
Sandy loam	1.6	0.057	1.66
Silt Loam	1.45	0.119	2
Loam	1.5	0.097	2.4
Sandy clay loam	1.45	0.137	1.66
Clay loam	1.45	0.157	1.9

TABLE 6-8. MEAN BULK DENSITY (g/cm3) FOR FIVE SOIL TEXTURAL CLASSIFICATIONSa,b

Soil Texture	Mean Value	Range Reported
Silt Loams	1.32	0.86 - 1.67
Clay and Clay Loams	1.3	0.94 - 1.54
Sandy Loams	1.49	1.25 - 1.76
Gravelly Silt Loams	1.22	1.02 - 1.58
Loams	1.42	1.16 - 1.58
All Soils	1.35	0.86 - 1.76

a Baes, C.F., III and R.D. Sharp. 1983. A Proposal for Estimation of Soil Leaching Constants for Use in Assessment Models. J. Environ. Qual. 12(1):17-28 (Original reference).

b From Dean et al. (1989)

TABLE 6-2. DESCRIPTIVE STATISTICS FOR SATURATED HYDRAULIC CONDUCTIVITY (cm hr-1)

Soil Type	Hydraulic Conductivity (Ks)* x	s	CV	n		
Clay**	0.2	0.42	210.3	114	cm/hr	17.52
Clay Loam	0.26	0.7	267.2	345	cm/hr	22.776
Loam	1.04	1.82	174.6	735	cm/hr	91.104
Loamy Sand	14.59	11.36	77.9	315	cm/hr	1278.084
Silt	0.25	0.33	129.9	88	cm/hr	21.9
Silt Loam	0.45	1.23	275.1	1093	cm/hr	39.42
Silty Clay	0.02	0.11	453.3	126	cm/hr	1.752
Silty Clay Loam	0.07	0.19	288.7	592	cm/hr	6.132
Sand	29.7	15.6	52.4	246	cm/hr	2601.72
Sandy Clay	0.12	0.28	234.1	46	cm/hr	10.512
Sandy Clay Loam	1.31	2.74	208.6	214	cm/hr	114.756
Sandy Loam	4.42	5.63	127	1183	cm/hr	387.192

* n = Sample size, = Mean, s = Standard deviation, CV = Coefficient of variation (percent)

** Agricultural soil, less than 60 percent clay

Sources: From Dean et al. (1989),
Original reference Carsel and Parrish (1988).

Saturated water content is the maximum volumetric amount of water in the soil when all pores are filled with water. Very often it is assumed that saturated water content equals the porosity n . However, in many cases qS is smaller than n due to the fact that small amounts of air will be trapped in very small pores. Residual water content can be defined as the asymptote of the pF-curve when h gets very high negative values. Usually qR is very small - on the order of 0.001--0.02 for coarse soils but gets as high values as 0.15..0.25 for heavy clay soils. Air entry point ha is

Soil texture. Fine-textured soils can hold much more organic matter than sandy soils for two reasons. First, clay particles form electrochemical bonds that hold organic compounds. Second, decomposition occurs faster in well-aerated sandy soils. A sandy loam rarely holds more than 2% organic matter.

The recharge rate in this model is the net amount of water that percolates directly into the aquifer system outside of the land disposal facility. The recharge is assumed to have no contamination and hence dilutes the groundwater contaminant plume. The recharge rate into the plume can be calculated in a variety of ways. One possibility is to use a model, such as HELP (Hydrologic Evaluation of Landfill Performance) (Schroeder et al., 1984), without any engineering controls (leachate collection system or a liner) to simulate the water balance for natural conditions.

The infiltration rate is the net amount of leachate that percolates into the aquifer system from a land disposal facility. Because of the use of engineering controls and the presence of non-native porous materials in the landfill facility, the infiltration rate will typically be different than the recharge rate. However, it can be estimated by similar

Most soils contain 2-10 percent organic matter. *The Importance of Soil Organic Matter: Key to Drought-Resistant Soil and Sustained Food Production. http://www.fao.org*

APPENDIX B

NMOCD APPROVAL OF STAGE 2 ABATEMENT PLAN

From:	Chase Acker
To:	Bruce McKenzie
Subject:	FW: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM
Date:	Monday, April 14, 2014 1:56:01 PM

From: Griswold, Jim, EMNRD [mailto:Jim.Griswold@state.nm.us]
Sent: Thursday, June 27, 2013 5:14 PM
To: Larry Wooten
Cc: Hall, Sharon; Chase Acker
Subject: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM

Mr. Wooten,

The Oil Conservation Division (OCD) has reviewed the Stage 2 Abatement Plan for the above-referenced site submitted on your behalf by Arcadis and dated 3/27/12. That plan has substantially met the requirements of 19.15.30 NMAC and is hereby approved. Please proceed with field activities.

Be advised this approval does not relieve Chesapeake of responsibility should the situation continue to pose a threat to groundwater, surface water, human health, or the environment. Furthermore, this approval does not relieve your responsibility for compliance with any federal, state, or local laws and/or regulations. Please retain a copy of this email for your files, as no hardcopy will be sent. If you have any questions, please feel free to contact me at any time.

Jim Griswold
Senior Hydrologist
EMNRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505.476.3465
email: jim.griswold@state.nm.us

APPENDIX C

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-40004-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: STATE M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

CathyGartner

Authorized for release by:
6/18/2018 5:47:30 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-40004-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-40004-1

Comments
No additional comments.

Receipt
The sample was received on 6/5/2018 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Client Sample ID: 20180604-M-SVE — Lab Sample ID: 320-40004-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	87.9		6.24		ppb v/v	15.6		TO-15	Total/NA
Ethylbenzene	250		6.24		ppb v/v	15.6		TO-15	Total/NA
4-Ethyltoluene	42.7		6.24		ppb v/v	15.6		TO-15	Total/NA
Toluene	34.4		6.24		ppb v/v	15.6		TO-15	Total/NA
1,2,4-Trimethylbenzene	71.3		12.5		ppb v/v	15.6		TO-15	Total/NA
1,3,5-Trimethylbenzene	46.2		6.24		ppb v/v	15.6		TO-15	Total/NA
m,p-Xylene	376		12.5		ppb v/v	15.6		TO-15	Total/NA
o-Xylene	107		6.24		ppb v/v	15.6		TO-15	Total/NA
Total VOC as Hexane (C6-C12)	46500		1560		ppb v/v	15.6		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Client Sample ID: 20180604-M-SVE
Date Collected: 06/04/18 10:30
Date Received: 06/05/18 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-40004-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		78.0		ppb v/v			06/16/18 21:41	15.6
Benzene	**87.9**		6.24		ppb v/v			06/16/18 21:41	15.6
Benzyl chloride	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Bromodichloromethane	ND		4.68		ppb v/v			06/16/18 21:41	15.6
Bromoform	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Bromomethane	ND		12.5		ppb v/v			06/16/18 21:41	15.6
2-Butanone (MEK)	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Carbon disulfide	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Carbon tetrachloride	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Chlorobenzene	ND		4.68		ppb v/v			06/16/18 21:41	15.6
Dibromochloromethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Chloroethane	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Chloroform	ND		4.68		ppb v/v			06/16/18 21:41	15.6
Chloromethane	ND		12.5		ppb v/v			06/16/18 21:41	15.6
1,2-Dibromoethane (EDB)	ND		12.5		ppb v/v			06/16/18 21:41	15.6
1,2-Dichlorobenzene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,3-Dichlorobenzene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,4-Dichlorobenzene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Dichlorodifluoromethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,1-Dichloroethane	ND		4.68		ppb v/v			06/16/18 21:41	15.6
1,2-Dichloroethane	ND		12.5		ppb v/v			06/16/18 21:41	15.6
1,1-Dichloroethene	ND		12.5		ppb v/v			06/16/18 21:41	15.6
cis-1,2-Dichloroethene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
trans-1,2-Dichloroethene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,2-Dichloropropane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
cis-1,3-Dichloropropene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
trans-1,3-Dichloropropene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Ethylbenzene	**250**		6.24		ppb v/v			06/16/18 21:41	15.6
4-Ethyltoluene	**42.7**		6.24		ppb v/v			06/16/18 21:41	15.6
Hexachlorobutadiene	ND		31.2		ppb v/v			06/16/18 21:41	15.6
2-Hexanone	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Methylene Chloride	ND		6.24		ppb v/v			06/16/18 21:41	15.6
4-Methyl-2-pentanone (MIBK)	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Styrene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,1,2,2-Tetrachloroethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Tetrachloroethene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Toluene	**34.4**		6.24		ppb v/v			06/16/18 21:41	15.6
1,2,4-Trichlorobenzene	ND		31.2		ppb v/v			06/16/18 21:41	15.6
1,1,1-Trichloroethane	ND		4.68		ppb v/v			06/16/18 21:41	15.6
1,1,2-Trichloroethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Trichloroethene	ND		6.24		ppb v/v			06/16/18 21:41	15.6
Trichlorofluoromethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		6.24		ppb v/v			06/16/18 21:41	15.6
1,2,4-Trimethylbenzene	**71.3**		12.5		ppb v/v			06/16/18 21:41	15.6
1,3,5-Trimethylbenzene	**46.2**		6.24		ppb v/v			06/16/18 21:41	15.6
Vinyl acetate	ND		12.5		ppb v/v			06/16/18 21:41	15.6
Vinyl chloride	ND		6.24		ppb v/v			06/16/18 21:41	15.6

Client Sample ID: 20180604-M-SVE
Date Collected: 06/04/18 10:30
Date Received: 06/05/18 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-40004-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	376		12.5		ppb v/v			06/16/18 21:41	15.6
o-Xylene	107		6.24		ppb v/v			06/16/18 21:41	15.6
Total VOC as Hexane (C6-C12)	46500		1560		ppb v/v			06/16/18 21:41	15.6

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*		*06/16/18 21:41*	*15.6*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*		*06/16/18 21:41*	*15.6*
Toluene-d8 (Surr)	*106*		*70 - 130*		*06/16/18 21:41*	*15.6*

Surrogate Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DCA	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-40004-1	20180604-M-SVE	108	97	106
LCS 320-229475/4	Lab Control Sample	106	100	106
LCSD 320-229475/5	Lab Control Sample Dup	105	98	104
MB 320-229475/9	Method Blank	100	92	103

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-229475/9
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.00		ppb v/v			06/16/18 16:35	1
Benzene	ND		0.400		ppb v/v			06/16/18 16:35	1
Benzyl chloride	ND		0.800		ppb v/v			06/16/18 16:35	1
Bromodichloromethane	ND		0.300		ppb v/v			06/16/18 16:35	1
Bromoform	ND		0.400		ppb v/v			06/16/18 16:35	1
Bromomethane	ND		0.800		ppb v/v			06/16/18 16:35	1
2-Butanone (MEK)	ND		0.800		ppb v/v			06/16/18 16:35	1
Carbon disulfide	ND		0.800		ppb v/v			06/16/18 16:35	1
Carbon tetrachloride	ND		0.800		ppb v/v			06/16/18 16:35	1
Chlorobenzene	ND		0.300		ppb v/v			06/16/18 16:35	1
Dibromochloromethane	ND		0.400		ppb v/v			06/16/18 16:35	1
Chloroethane	ND		0.800		ppb v/v			06/16/18 16:35	1
Chloroform	ND		0.300		ppb v/v			06/16/18 16:35	1
Chloromethane	ND		0.800		ppb v/v			06/16/18 16:35	1
1,2-Dibromoethane (EDB)	ND		0.800		ppb v/v			06/16/18 16:35	1
1,2-Dichlorobenzene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,3-Dichlorobenzene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,4-Dichlorobenzene	ND		0.400		ppb v/v			06/16/18 16:35	1
Dichlorodifluoromethane	ND		0.400		ppb v/v			06/16/18 16:35	1
1,1-Dichloroethane	ND		0.300		ppb v/v			06/16/18 16:35	1
1,2-Dichloroethane	ND		0.800		ppb v/v			06/16/18 16:35	1
1,1-Dichloroethene	ND		0.800		ppb v/v			06/16/18 16:35	1
cis-1,2-Dichloroethene	ND		0.400		ppb v/v			06/16/18 16:35	1
trans-1,2-Dichloroethene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,2-Dichloropropane	ND		0.400		ppb v/v			06/16/18 16:35	1
cis-1,3-Dichloropropene	ND		0.400		ppb v/v			06/16/18 16:35	1
trans-1,3-Dichloropropene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.400		ppb v/v			06/16/18 16:35	1
Ethylbenzene	ND		0.400		ppb v/v			06/16/18 16:35	1
4-Ethyltoluene	ND		0.400		ppb v/v			06/16/18 16:35	1
Hexachlorobutadiene	ND		2.00		ppb v/v			06/16/18 16:35	1
2-Hexanone	ND		0.400		ppb v/v			06/16/18 16:35	1
Methylene Chloride	ND		0.400		ppb v/v			06/16/18 16:35	1
4-Methyl-2-pentanone (MIBK)	ND		0.400		ppb v/v			06/16/18 16:35	1
Styrene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,1,2,2-Tetrachloroethane	ND		0.400		ppb v/v			06/16/18 16:35	1
Tetrachloroethene	ND		0.400		ppb v/v			06/16/18 16:35	1
Toluene	ND		0.400		ppb v/v			06/16/18 16:35	1
1,2,4-Trichlorobenzene	ND		2.00		ppb v/v			06/16/18 16:35	1
1,1,1-Trichloroethane	ND		0.300		ppb v/v			06/16/18 16:35	1
1,1,2-Trichloroethane	ND		0.400		ppb v/v			06/16/18 16:35	1
Trichloroethene	ND		0.400		ppb v/v			06/16/18 16:35	1
Trichlorofluoromethane	ND		0.400		ppb v/v			06/16/18 16:35	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.400		ppb v/v			06/16/18 16:35	1
1,2,4-Trimethylbenzene	ND		0.800		ppb v/v			06/16/18 16:35	1
1,3,5-Trimethylbenzene	ND		0.400		ppb v/v			06/16/18 16:35	1
Vinyl acetate	ND		0.800		ppb v/v			06/16/18 16:35	1
Vinyl chloride	ND		0.400		ppb v/v			06/16/18 16:35	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-229475/9
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.800		ppb v/v			06/16/18 16:35	1
o-Xylene	ND		0.400		ppb v/v			06/16/18 16:35	1
Total VOC as Hexane (C6-C12)	ND		100		ppb v/v			06/16/18 16:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*06/16/18 16:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*06/16/18 16:35*	*1*
Toluene-d8 (Surr)	*103*		*70 - 130*		*06/16/18 16:35*	*1*

Lab Sample ID: LCS 320-229475/4
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	16.57		ppb v/v		83	65 - 125
Benzene	20.0	19.94		ppb v/v		100	68 - 128
Benzyl chloride	16.0	16.84		ppb v/v		105	67 - 127
Bromodichloromethane	20.0	20.04		ppb v/v		100	71 - 131
Bromoform	20.0	19.35		ppb v/v		97	66 - 126
Bromomethane	20.0	19.83		ppb v/v		99	73 - 134
2-Butanone (MEK)	20.0	21.11		ppb v/v		106	73 - 133
Carbon disulfide	20.0	19.06		ppb v/v		95	71 - 131
Carbon tetrachloride	20.0	18.44		ppb v/v		92	63 - 126
Chlorobenzene	20.0	18.43		ppb v/v		92	63 - 123
Dibromochloromethane	20.0	19.13		ppb v/v		96	66 - 126
Chloroethane	20.0	19.86		ppb v/v		99	73 - 133
Chloroform	20.0	19.73		ppb v/v		99	70 - 130
Chloromethane	20.0	19.52		ppb v/v		98	61 - 140
1,2-Dibromoethane (EDB)	20.0	18.71		ppb v/v		94	64 - 124
1,2-Dichlorobenzene	20.0	19.85		ppb v/v		99	62 - 126
1,3-Dichlorobenzene	20.0	20.12		ppb v/v		101	59 - 130
1,4-Dichlorobenzene	20.0	20.26		ppb v/v		101	58 - 132
Dichlorodifluoromethane	20.0	20.12		ppb v/v		101	69 - 129
1,1-Dichloroethane	20.0	19.73		ppb v/v		99	71 - 131
1,2-Dichloroethane	20.0	19.33		ppb v/v		97	71 - 131
1,1-Dichloroethene	20.0	18.79		ppb v/v		94	72 - 132
cis-1,2-Dichloroethene	20.0	19.84		ppb v/v		99	70 - 130
trans-1,2-Dichloroethene	20.0	19.12		ppb v/v		96	72 - 132
1,2-Dichloropropane	20.0	19.96		ppb v/v		100	72 - 132
cis-1,3-Dichloropropene	20.0	19.75		ppb v/v		99	72 - 132
trans-1,3-Dichloropropene	20.0	19.18		ppb v/v		96	66 - 126
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	20.51		ppb v/v		103	74 - 134
Ethylbenzene	20.0	20.26		ppb v/v		101	64 - 124
4-Ethyltoluene	20.0	20.72		ppb v/v		104	66 - 129
Hexachlorobutadiene	20.0	20.61		ppb v/v		103	58 - 131
2-Hexanone	20.0	18.83		ppb v/v		94	69 - 129
Methylene Chloride	20.0	18.50		ppb v/v		92	67 - 127

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-229475/4
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
4-Methyl-2-pentanone (MIBK)			20.0	20.17		ppb v/v		101	74 - 134		
Styrene			20.0	20.18		ppb v/v		101	67 - 127		
1,1,2,2-Tetrachloroethane			20.0	19.44		ppb v/v		97	64 - 124		
Tetrachloroethene			20.0	18.97		ppb v/v		95	63 - 123		
Toluene			20.0	20.66		ppb v/v		103	68 - 128		
1,2,4-Trichlorobenzene			20.0	20.79		ppb v/v		104	58 - 138		
1,1,1-Trichloroethane			20.0	19.43		ppb v/v		97	69 - 129		
1,1,2-Trichloroethane			20.0	18.95		ppb v/v		95	64 - 124		
Trichloroethene			20.0	19.94		ppb v/v		100	70 - 130		
Trichlorofluoromethane			20.0	19.26		ppb v/v		96	71 - 131		
1,1,2-Trichloro-1,2,2-trifluoroethane			20.0	19.20		ppb v/v		96	70 - 130		
1,2,4-Trimethylbenzene			20.0	20.17		ppb v/v		101	60 - 132		
1,3,5-Trimethylbenzene			20.0	20.83		ppb v/v		104	65 - 125		
Vinyl acetate			20.0	19.24		ppb v/v		96	65 - 134		
Vinyl chloride			20.0	19.91		ppb v/v		100	59 - 152		
Hexane			20.0	18.41		ppb v/v		92	70 - 130		
m,p-Xylene			40.0	40.98		ppb v/v		102	65 - 125		
o-Xylene			20.0	20.12		ppb v/v		101	65 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*
Toluene-d8 (Surr)	*106*		*70 - 130*

Lab Sample ID: LCSD 320-229475/5
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			20.0	17.22		ppb v/v		86	65 - 125	4	25
Benzene			20.0	17.62		ppb v/v		88	68 - 128	12	25
Benzyl chloride			16.0	16.13		ppb v/v		101	67 - 127	4	25
Bromodichloromethane			20.0	18.39		ppb v/v		92	71 - 131	9	25
Bromoform			20.0	18.19		ppb v/v		91	66 - 126	6	25
Bromomethane			20.0	18.87		ppb v/v		94	73 - 134	5	25
2-Butanone (MEK)			20.0	20.56		ppb v/v		103	73 - 133	3	25
Carbon disulfide			20.0	18.13		ppb v/v		91	71 - 131	5	25
Carbon tetrachloride			20.0	17.07		ppb v/v		85	63 - 126	8	25
Chlorobenzene			20.0	17.39		ppb v/v		87	63 - 123	6	25
Dibromochloromethane			20.0	17.57		ppb v/v		88	66 - 126	8	25
Chloroethane			20.0	19.01		ppb v/v		95	73 - 133	4	25
Chloroform			20.0	18.23		ppb v/v		91	70 - 130	8	25
Chloromethane			20.0	18.71		ppb v/v		94	61 - 140	4	25
1,2-Dibromoethane (EDB)			20.0	17.65		ppb v/v		88	64 - 124	6	25
1,2-Dichlorobenzene			20.0	18.94		ppb v/v		95	62 - 126	5	25
1,3-Dichlorobenzene			20.0	19.06		ppb v/v		95	59 - 130	5	25
1,4-Dichlorobenzene			20.0	19.22		ppb v/v		96	58 - 132	5	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-229475/5
Matrix: Air
Analysis Batch: 229475

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane			20.0	19.10		ppb v/v		95	69 - 129	5	25
1,1-Dichloroethane			20.0	18.05		ppb v/v		90	71 - 131	9	25
1,2-Dichloroethane			20.0	16.85		ppb v/v		84	71 - 131	14	25
1,1-Dichloroethene			20.0	17.83		ppb v/v		89	72 - 132	5	25
cis-1,2-Dichloroethene			20.0	18.38		ppb v/v		92	70 - 130	8	25
trans-1,2-Dichloroethene			20.0	17.79		ppb v/v		89	72 - 132	7	25
1,2-Dichloropropane			20.0	18.06		ppb v/v		90	72 - 132	10	25
cis-1,3-Dichloropropene			20.0	17.71		ppb v/v		89	72 - 132	11	25
trans-1,3-Dichloropropene			20.0	18.01		ppb v/v		90	66 - 126	6	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			20.0	19.54		ppb v/v		98	74 - 134	5	25
Ethylbenzene			20.0	19.19		ppb v/v		96	64 - 124	5	25
4-Ethyltoluene			20.0	19.85		ppb v/v		99	66 - 129	4	25
Hexachlorobutadiene			20.0	19.96		ppb v/v		100	58 - 131	3	25
2-Hexanone			20.0	17.69		ppb v/v		88	69 - 129	6	25
Methylene Chloride			20.0	17.12		ppb v/v		86	67 - 127	8	25
4-Methyl-2-pentanone (MIBK)			20.0	18.23		ppb v/v		91	74 - 134	10	25
Styrene			20.0	19.17		ppb v/v		96	67 - 127	5	25
1,1,2,2-Tetrachloroethane			20.0	18.44		ppb v/v		92	64 - 124	5	25
Tetrachloroethene			20.0	18.25		ppb v/v		91	63 - 123	4	25
Toluene			20.0	18.96		ppb v/v		95	68 - 128	9	25
1,2,4-Trichlorobenzene			20.0	20.06		ppb v/v		100	58 - 138	4	25
1,1,1-Trichloroethane			20.0	18.05		ppb v/v		90	69 - 129	7	25
1,1,2-Trichloroethane			20.0	17.93		ppb v/v		90	64 - 124	6	25
Trichloroethene			20.0	18.57		ppb v/v		93	70 - 130	7	25
Trichlorofluoromethane			20.0	18.52		ppb v/v		93	71 - 131	4	25
1,1,2-Trichloro-1,2,2-trifluoroethane			20.0	18.16		ppb v/v		91	70 - 130	6	25
1,2,4-Trimethylbenzene			20.0	19.14		ppb v/v		96	60 - 132	5	25
1,3,5-Trimethylbenzene			20.0	19.92		ppb v/v		100	65 - 125	4	25
Vinyl acetate			20.0	18.40		ppb v/v		92	65 - 134	4	25
Vinyl chloride			20.0	19.22		ppb v/v		96	59 - 152	4	25
Hexane			20.0	17.14		ppb v/v		86	70 - 130	7	25
m,p-Xylene			40.0	38.90		ppb v/v		97	65 - 125	5	25
o-Xylene			20.0	19.12		ppb v/v		96	65 - 125	5	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Air - GC/MS VOA

Analysis Batch: 229475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-40004-1	20180604-M-SVE	Total/NA	Air	TO-15	
MB 320-229475/9	Method Blank	Total/NA	Air	TO-15	
LCS 320-229475/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-229475/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Client Sample ID: 20180604-M-SVE
Date Collected: 06/04/18 10:30
Date Received: 06/05/18 09:15

Lab Sample ID: 320-40004-1
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		15.6	25 mL	250 mL	229475	06/16/18 21:41	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-18

Method Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: STATE M-1

TestAmerica Job ID: 320-40004-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-40004-1	20180604-M-SVE	Air	06/04/18 10:30	06/05/18 09:15

CHAIN OF CUSTODY RECORD

No. 04199

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKH STM 101	PROJECT NAME: CHK STATE M	COC 1 of 1
SHIPPED TO: TA-320	PROJECT MANAGER: BRUCE McKENZIE	TAT: STANDARD

SAMPLER'S PRINTED NAME: Terry Fisher
SAMPLER'S SIGNATURE:

TAG # (White): 34000832
CAN # 12428

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	TO-15 TOTAL VOCS AS HEXANE	REMARKS
6-4-18	1030	20180604-M-SVE	Air	1	X X	

320-90004 Chain of Custody

TOTAL NUMBER OF CONTAINERS → 1

RELINQUISHED BY:	DATE 6-4-18 TIME 1500	RECEIVED BY:	DATE 6-5-18 TIME 710
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FEDEX
AIRBILL NUMBER: 7111 9985 1512

RECEIVED IN LABORATORY BY: DATE TIME

Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at julie.czech@ecogrp.com

LABORATORY CONTACT: CATHY O 480 615-301-5041

LABORATORY ADDRESS: 880 RIVERSIDE PARKWAY W. SACRAMENTO, CA 95605

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Tag ID = 20180604 Start 1015 End 1025

6/18/2018

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 320-40004-1
SDG Number: Property ID: 891077

Login Number: 40004
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Not requested on COC.
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: B 04-24-18

Date of QC: 5/9/18

320-38447 Chain of Custody

Data File Number: 1805092\

(File ID for certification analysis of canister designated below)

CANISTER ID NUMBERS

*	34000589
	7799
	34000832
	34001386
	34002100
	34002081
	7851
	8407
	34000586
	34000100
	34001261
	34000592

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED

1st Level Reviewed By — Date: 5/10/18

2nd Level Reviewed By — Date: 5/10/18

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38447-1

SDG No.:

Client Sample ID: 34000589 Lab Sample ID: 320-38447-1

Matrix: Air Lab File ID: 18050921.D

Analysis Method: TO-15 Date Collected: 04/24/2018 00:00

Sample wt/vol: 250(mL) Date Analyzed: 05/10/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 222314 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	1.2	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	0.17	J	0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38447-1

SDG No.:

Client Sample ID: 34000589 Lab Sample ID: 320-38447-1

Matrix: Air Lab File ID: 18050921.D

Analysis Method: TO-15 Date Collected: 04/24/2018 00:00

Sample wt/vol: 250(mL) Date Analyzed: 05/10/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 222314 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	0.095	J B	0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	0.39	J B	0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38447-1

SDG No.:

Client Sample ID: 34000589 Lab Sample ID: 320-38447-1

Matrix: Air Lab File ID: 18050921.D

Analysis Method: TO-15 Date Collected: 04/24/2018 00:00

Sample wt/vol: 250(mL) Date Analyzed: 05/10/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 222314 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	98		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		70-130
2037-26-5	Toluene-d8 (Surr)	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D
Lims ID: 320-38447-A-1
Client ID: 34000589
Sample Type: Client
Inject. Date: 10-May-2018 03:58:30 ALS Bottle#: 27 Worklist Smp#: 21
Purge Vol: 250.000 mL Dil. Factor: 1.0000
Sample Info: 320-38447-A-1
Misc. Info.: 500
Operator ID: SRS Instrument ID: ATMS2

Method: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\TO15_ATMS2N.m
Limit Group: MSA - TO15 - ICAL
Last Update: 10-May-2018 18:41:23 Calib Date: 21-Apr-2018 22:42:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS2\20180421-57027.b\18042112.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK014

First Level Reviewer: phanthasena Date: 10-May-2018 18:41:23

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	11.368	11.368	0.000	96	50679	4.00	
* 2 1,4-Difluorobenzene	114	13.454	13.454	0.000	96	205149	4.00	
* 3 Chlorobenzene-d5 (IS)	117	19.513	19.513	0.000	90	189567	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	12.517	12.517	0.000	0	84934	3.85	
$ 5 Toluene-d8 (Surr)	100	16.685	16.679	0.006	98	130776	3.91	
$ 6 4-Bromofluorobenzene (Surr	95	21.533	21.533	0.000	89	139748	3.92	
10 Propene	41	3.940	3.933	0.007	98	5248	0.3861	
32 Acetone	43	6.951	6.896	0.055	92	18190	1.19	
39 Methylene Chloride	49	8.070	8.076	-0.006	42	1829	0.0946	
40 Carbon disulfide	76	8.119	8.113	0.006	99	5141	0.1750	

Reagents:

VAMSIS20_00146 Amount Added: 50.00 Units: mL Run Reagent

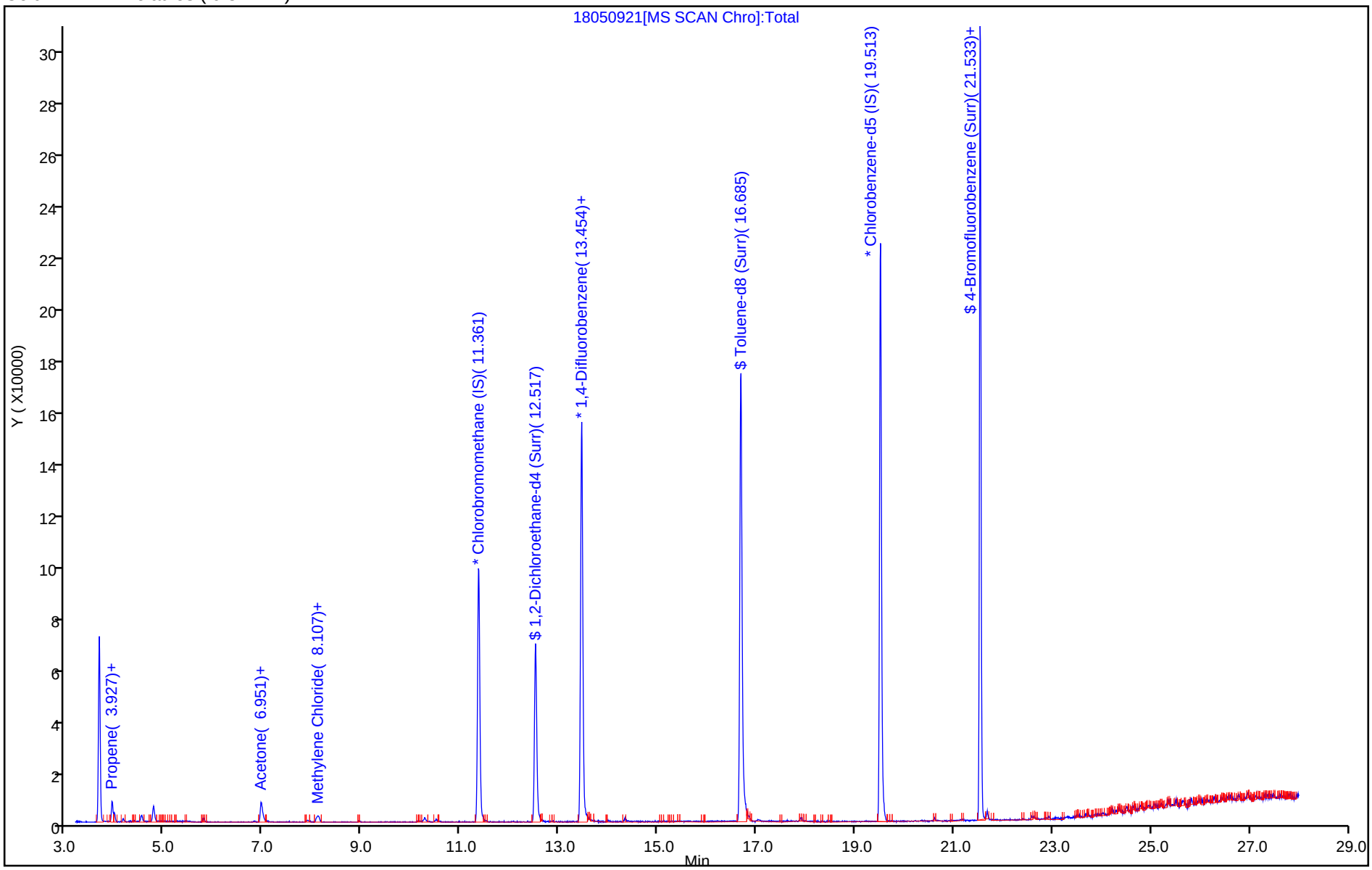
Report Date: 10-May-2018 18:41:24 Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D

Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2	Operator ID:	SRS
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1	Worklist Smp#:	21
Client ID:	34000589				
Purge Vol:	250.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	27
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



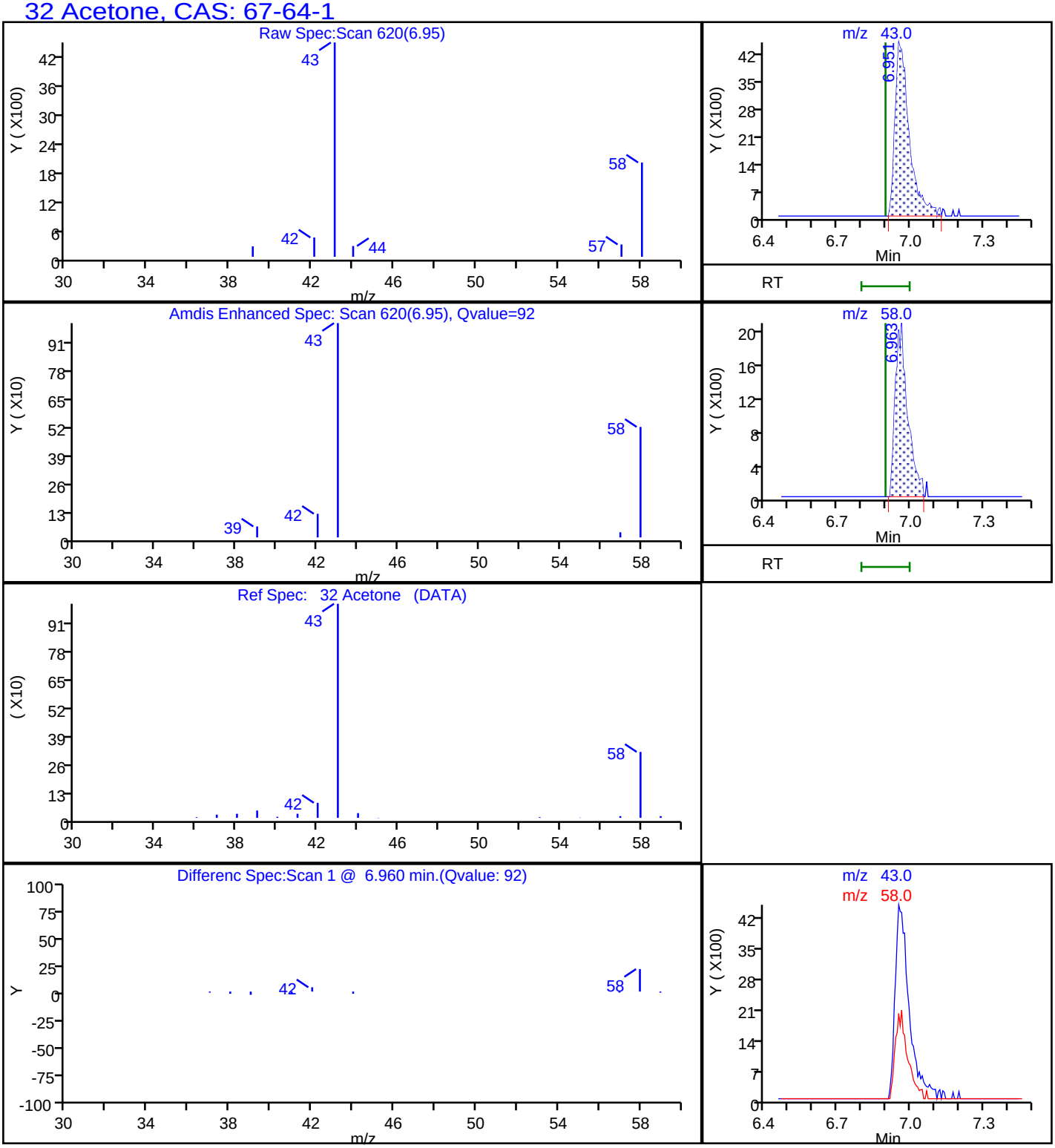
Report Date: 10-May-2018 18:41:24 Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D

Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1



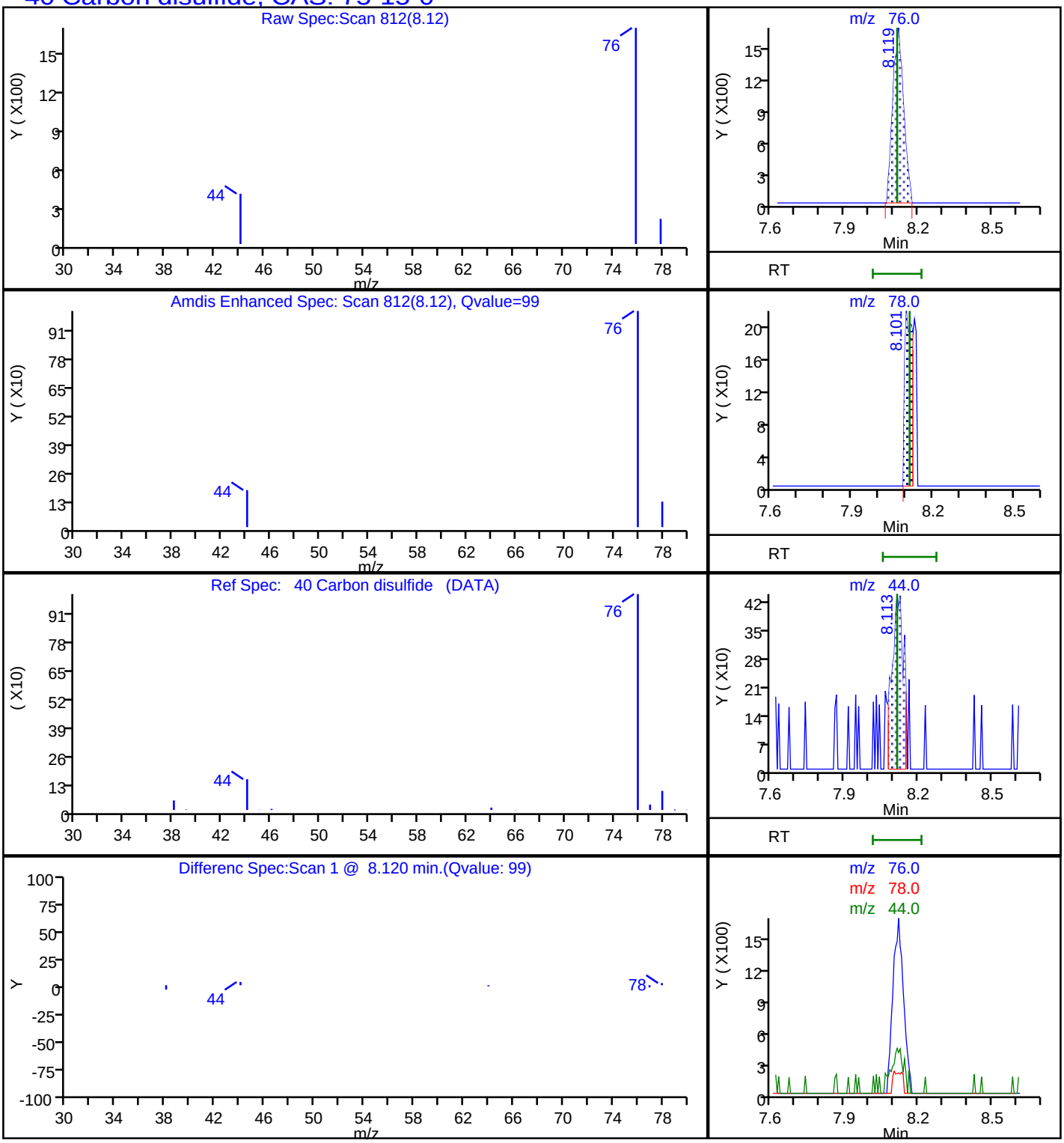
Report Date: 10-May-2018 18:41:24 Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D

Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

40 Carbon disulfide, CAS: 75-15-0



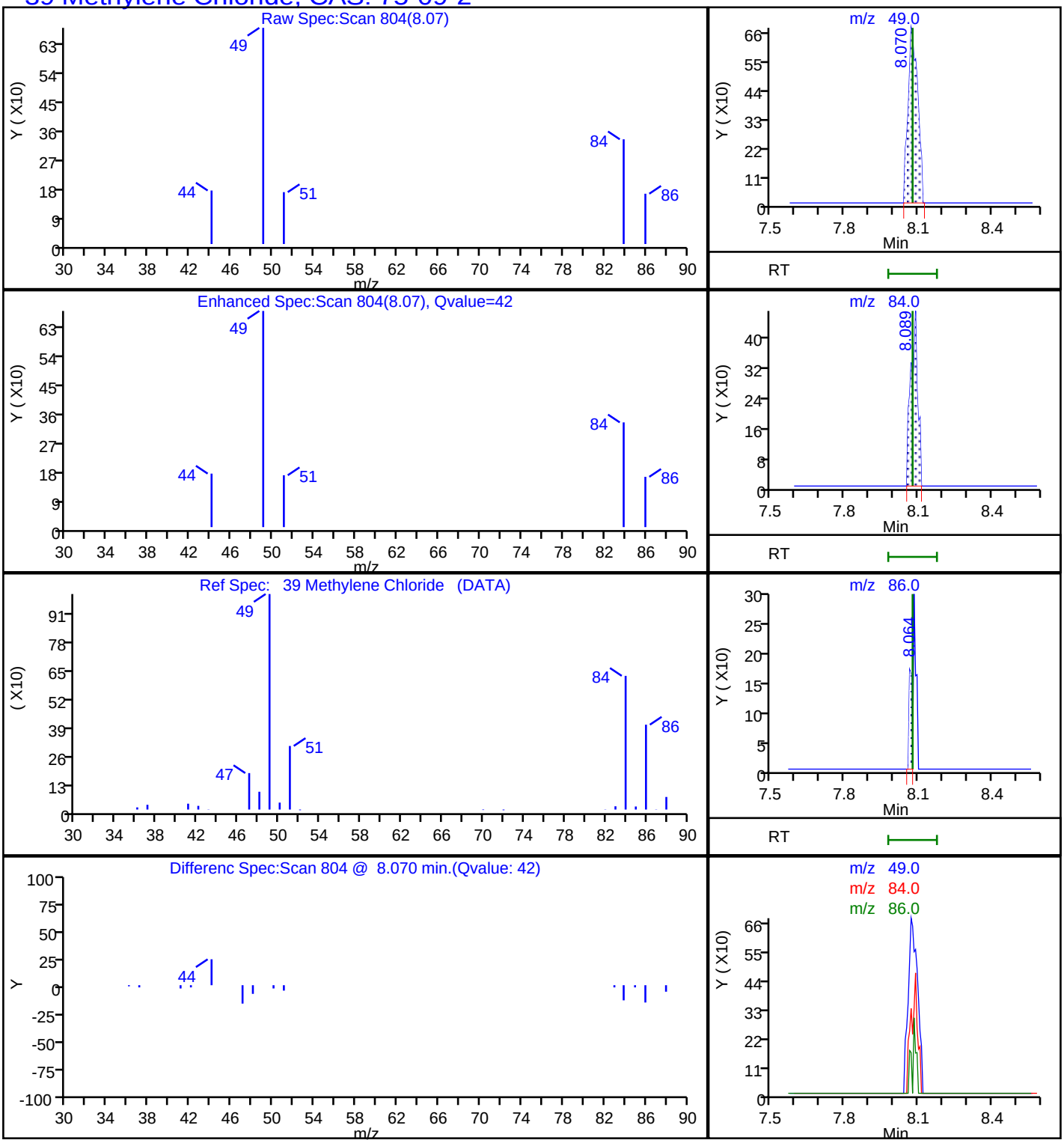
Report Date: 10-May-2018 18:41:24 Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D

Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

39 Methylene Chloride, CAS: 75-09-2



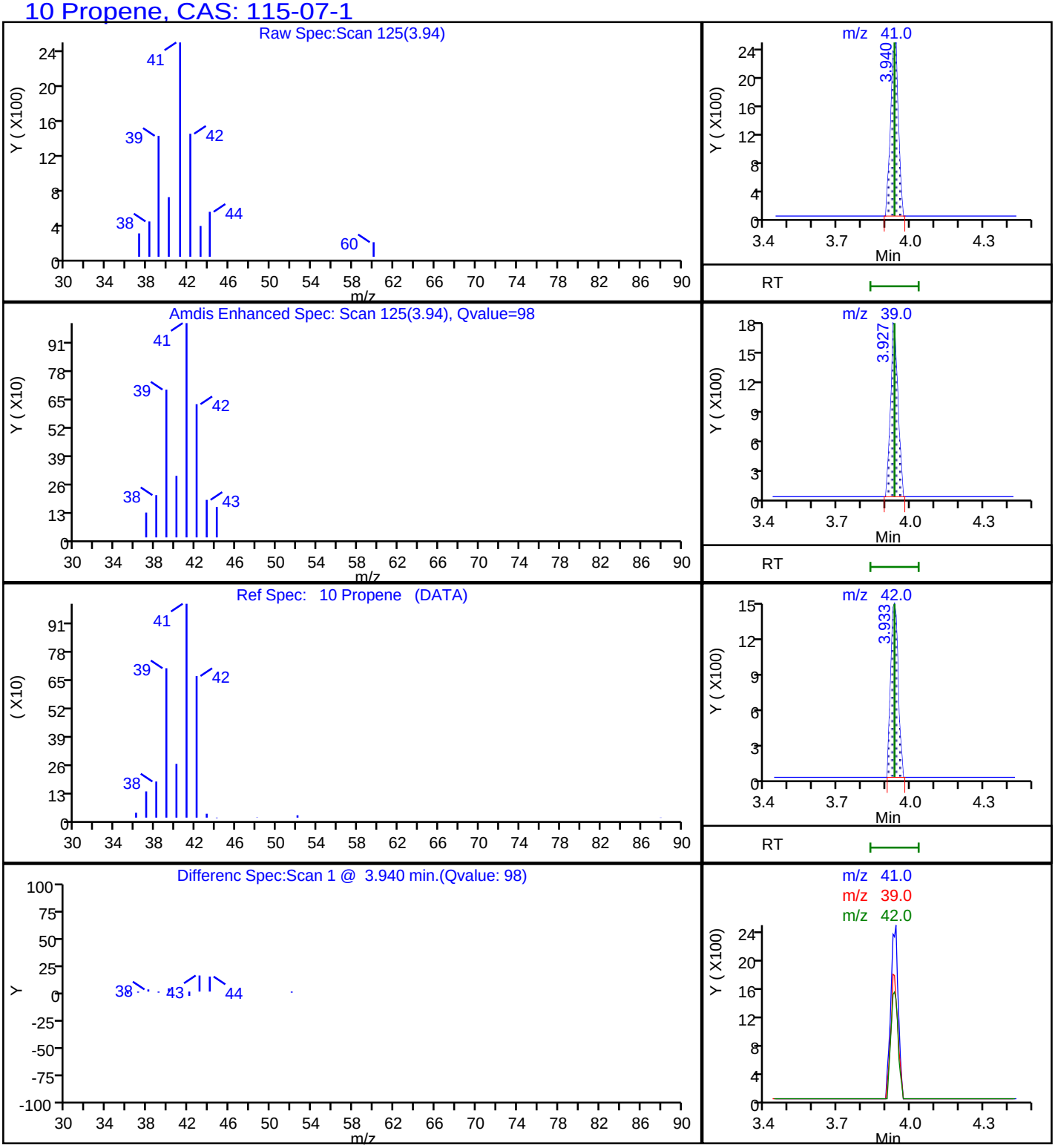
Report Date: 10-May-2018 18:41:24 Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D

Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

10 Propene, CAS: 115-07-1



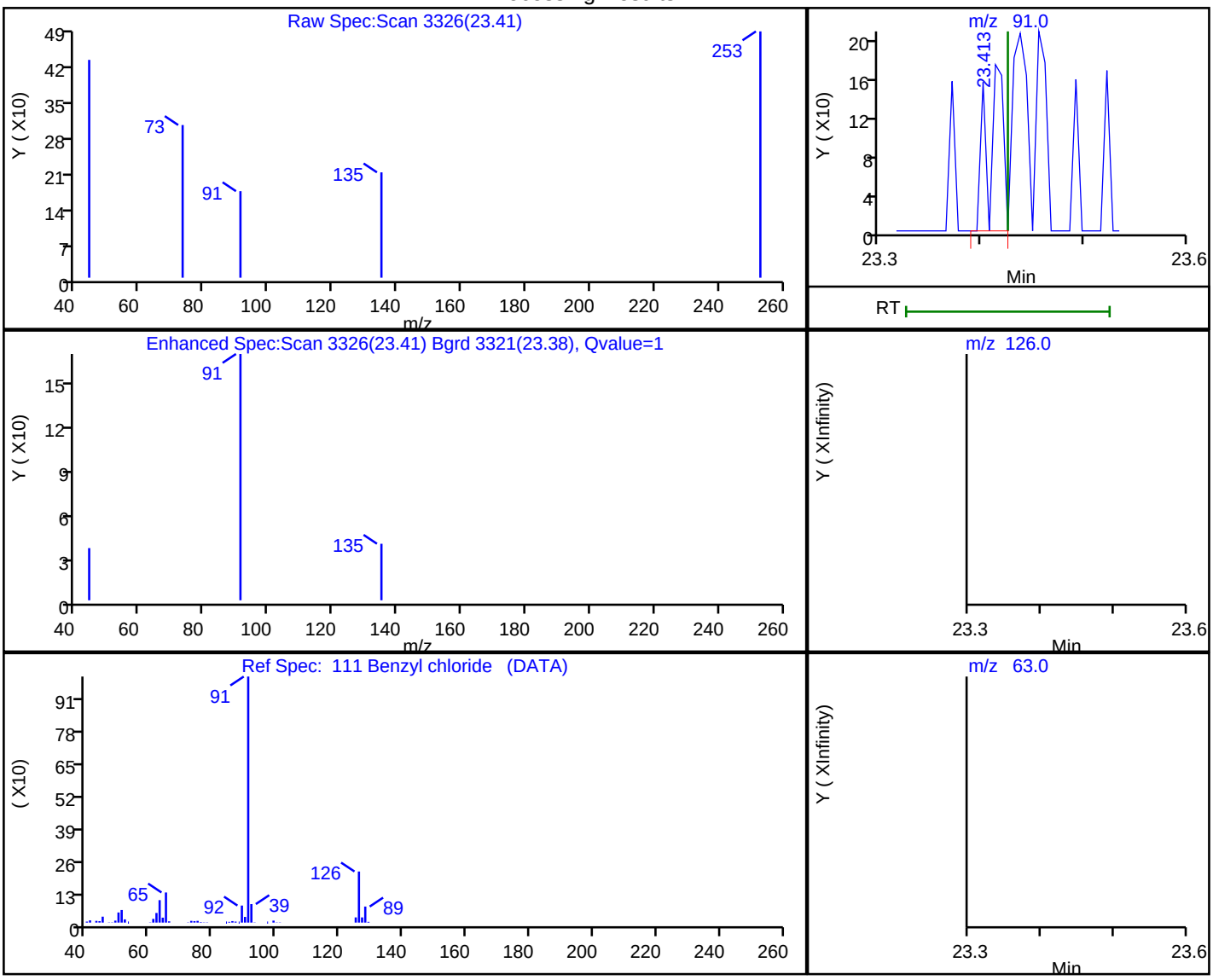
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D				
Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

111 Benzyl chloride, CAS: 100-44-7

Processing Results



RT	Mass	Response	Amount
23.41	91.00	176	0.003265
23.43	126.00	0	
23.43	63.00	0	

Reviewer: phanthasena, 10-May-2018 18:41:23

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

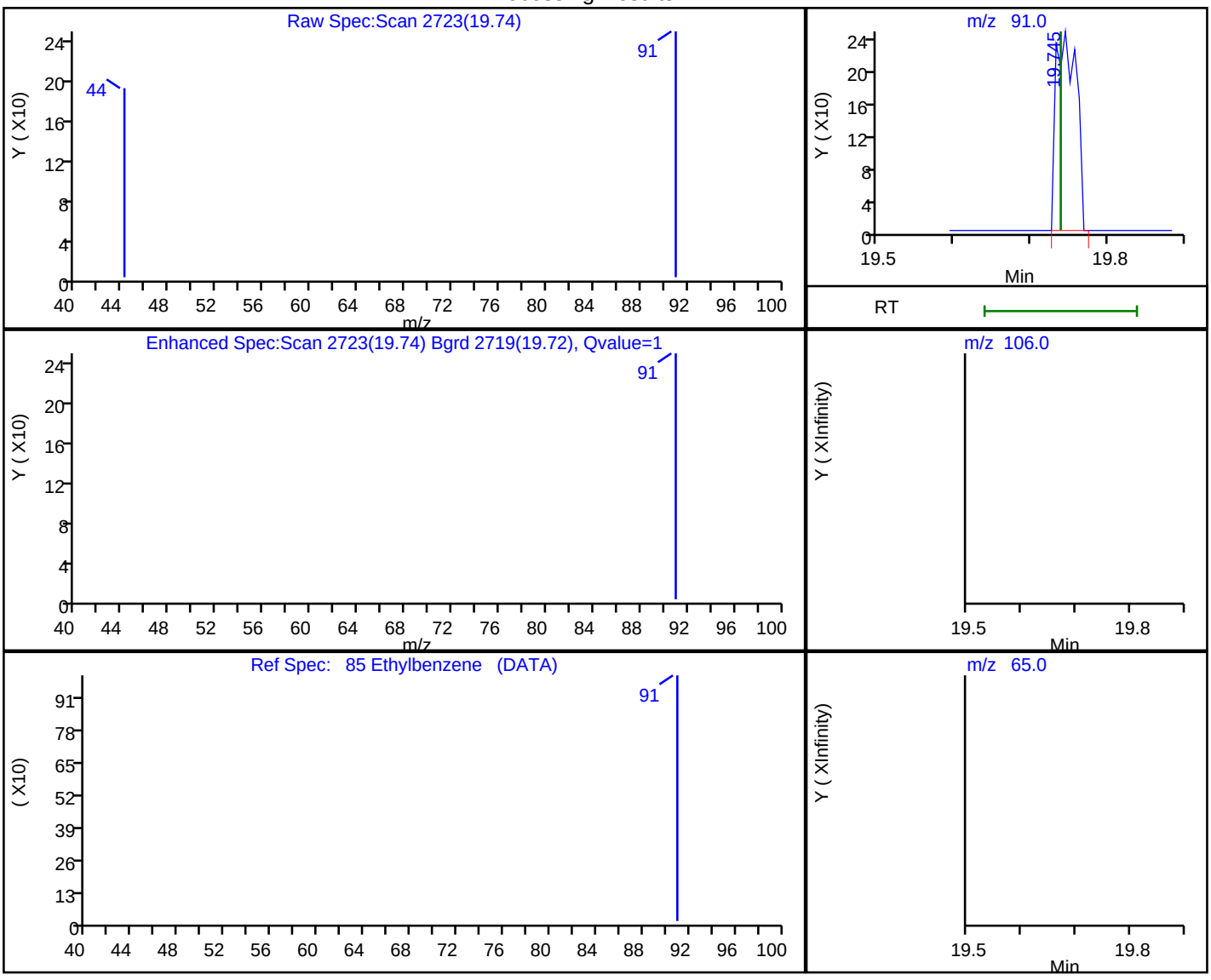
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D				
Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

85 Ethylbenzene, CAS: 100-41-4

Processing Results



RT	Mass	Response	Amount
19.74	91.00	448	0.009742
19.74	106.00	0	
19.74	65.00	0	

Reviewer: phanthasena, 10-May-2018 18:41:23

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

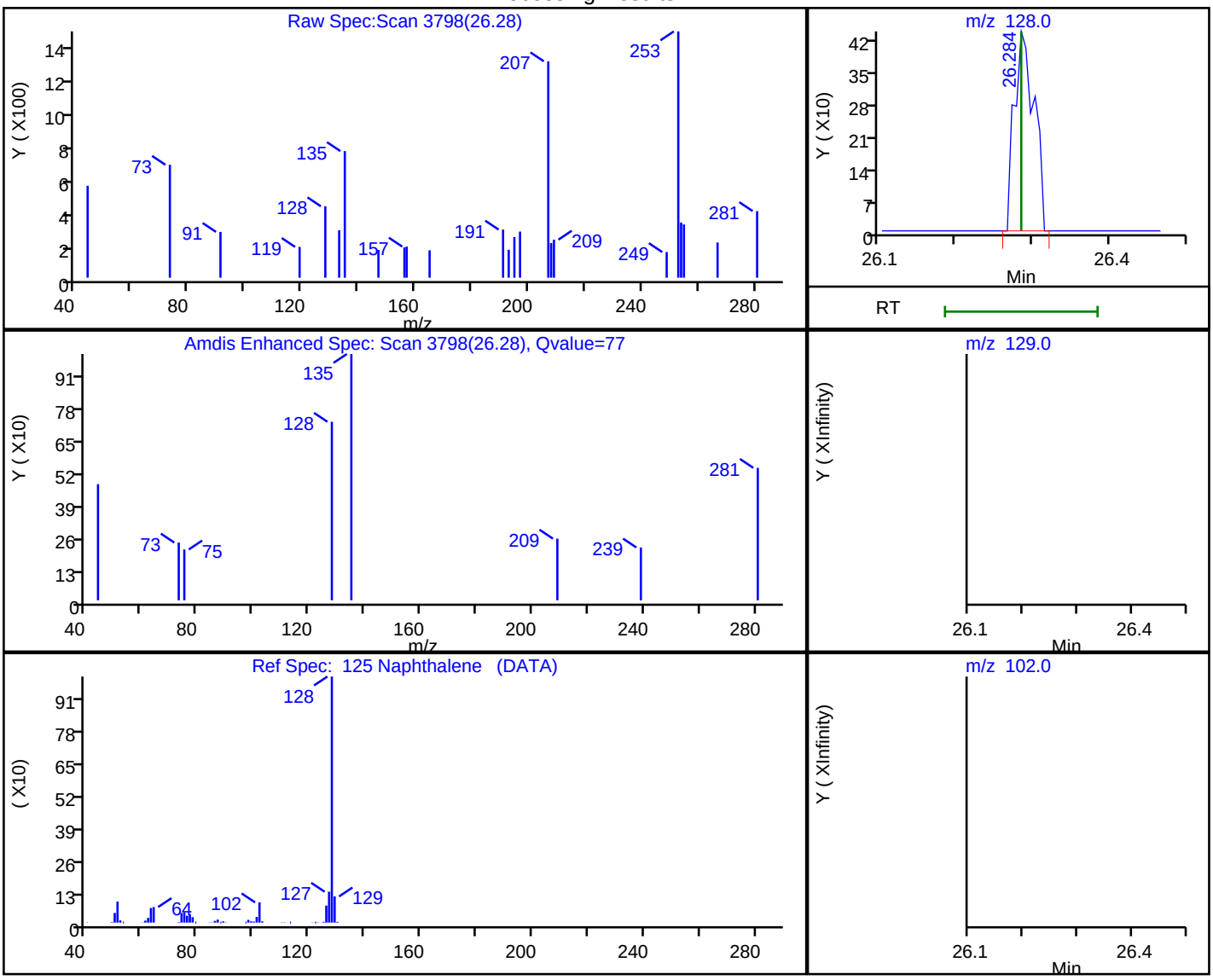
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D				
Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

125 Naphthalene, CAS: 91-20-3

Processing Results



RT	Mass	Response	Amount
26.28	128.00	779	0.012503
26.28	129.00	0	
26.28	102.00	0	

Reviewer: phanthasena, 10-May-2018 18:41:23

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

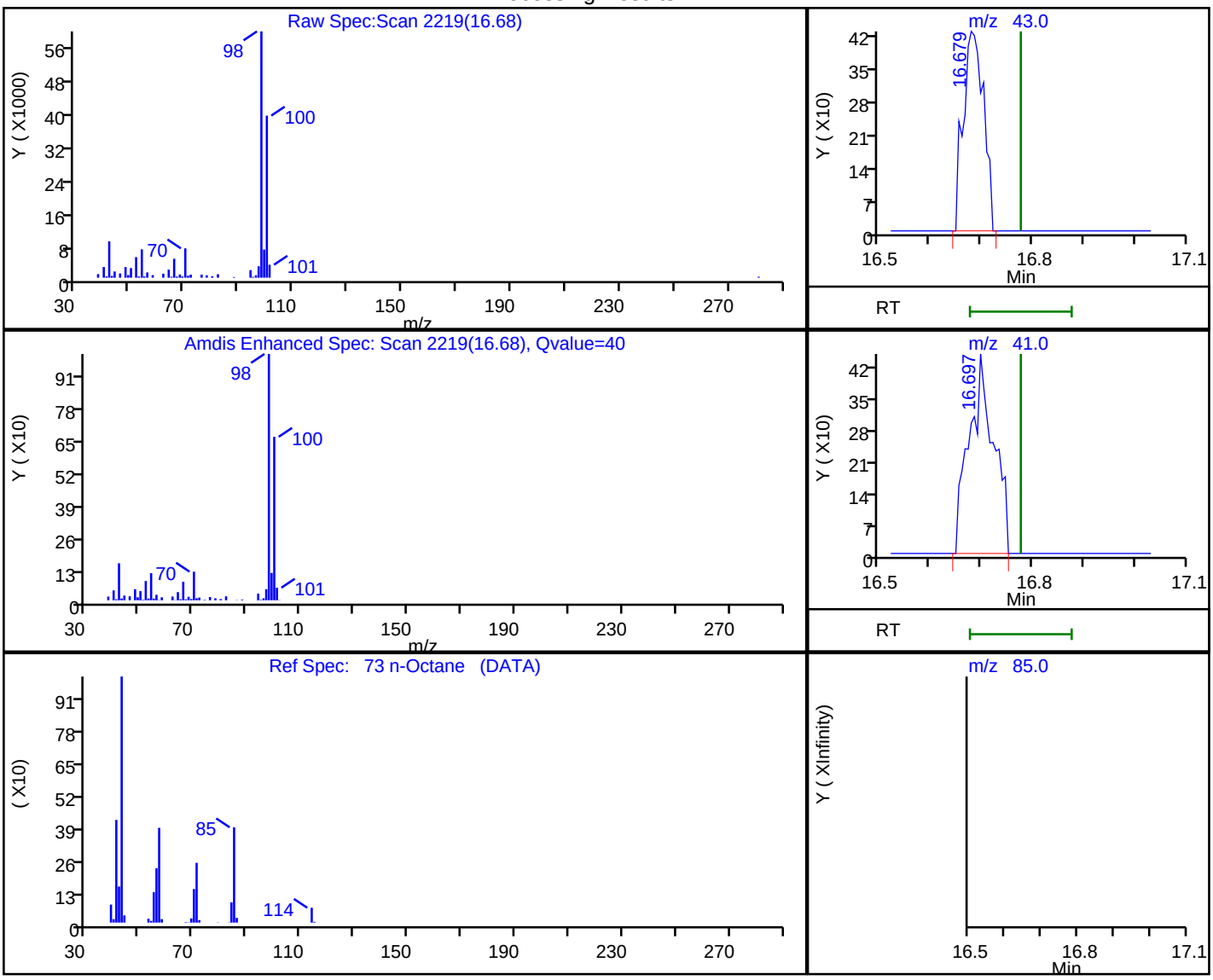
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D				
Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

73 n-Octane, CAS: 111-65-9

Processing Results



RT	Mass	Response	Amount
16.68	43.00	1178	0.032636
16.70	41.00	1479	
16.78	85.00	0	

Reviewer: phanthasena, 10-May-2018 18:41:23

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

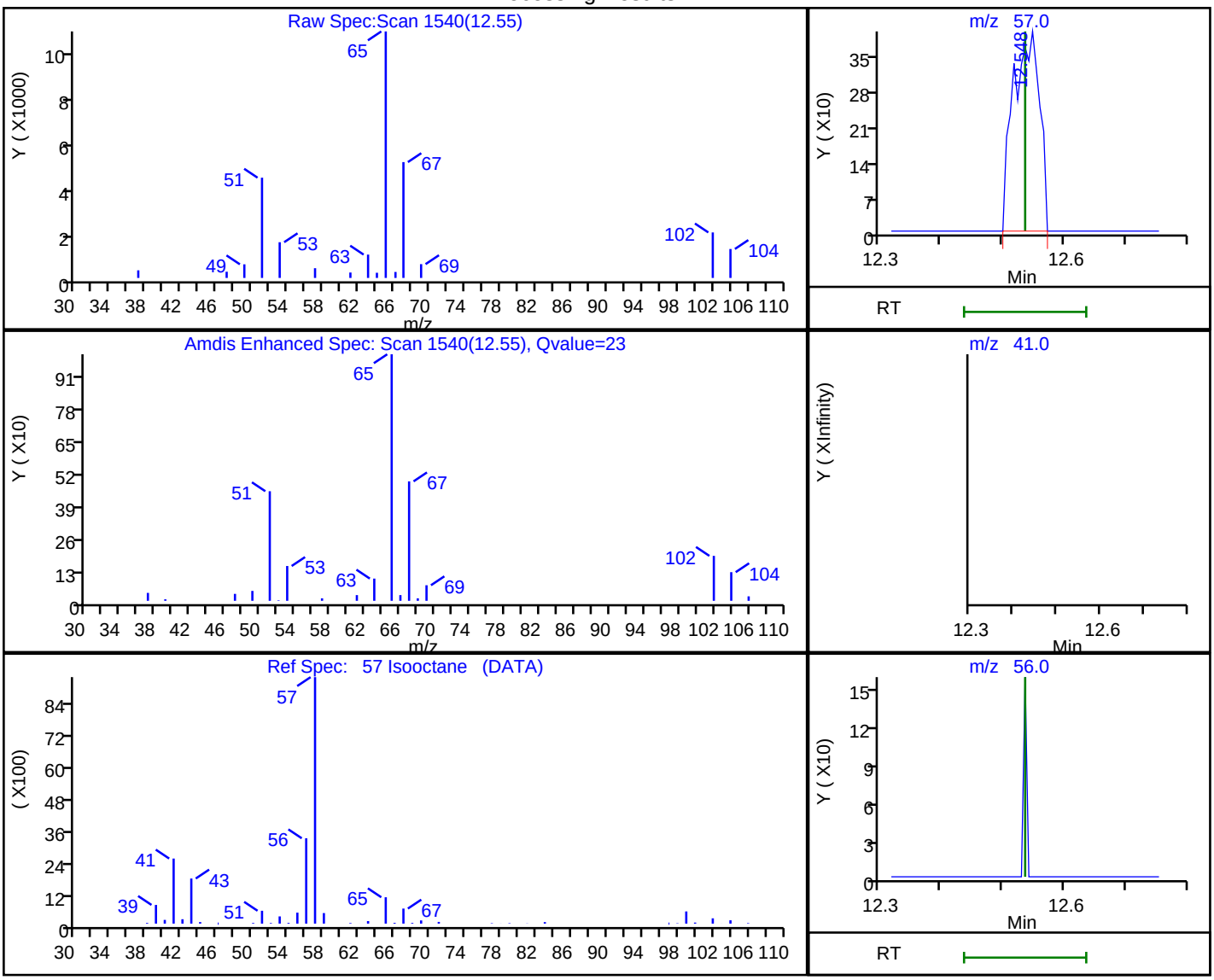
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS2\20180509-57907.b\18050921.D				
Injection Date:	10-May-2018 03:58:30	Instrument ID:	ATMS2		
Lims ID:	320-38447-A-1	Lab Sample ID:	320-38447-1		
Client ID:	34000589				
Operator ID:	SRS	ALS Bottle#:	27	Worklist Smp#:	21
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

57 Isooctane, CAS: 540-84-1

Processing Results



RT	Mass	Response	Amount
12.55	57.00	1182	0.014273
12.54	41.00	0	
12.54	56.00	0	

Reviewer: phanthasena, 10-May-2018 18:41:23

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-42983-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

CathyGartner

Authorized for release by:
9/20/2018 3:39:49 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-42983-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-42983-1

Comments
No additional comments.

Receipt
The sample was received on 9/10/2018 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Client Sample ID: 20180906-M-SVE

Lab Sample ID: 320-42983-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	112		9.91		ppb v/v	24.77		TO-15	Total/NA
Ethylbenzene	334		9.91		ppb v/v	24.77		TO-15	Total/NA
4-Ethyltoluene	89.2		9.91		ppb v/v	24.77		TO-15	Total/NA
Toluene	44.3		9.91		ppb v/v	24.77		TO-15	Total/NA
1,2,4-Trimethylbenzene	134		19.8		ppb v/v	24.77		TO-15	Total/NA
1,3,5-Trimethylbenzene	88.6		9.91		ppb v/v	24.77		TO-15	Total/NA
m,p-Xylene	501		19.8		ppb v/v	24.77		TO-15	Total/NA
o-Xylene	153		9.91		ppb v/v	24.77		TO-15	Total/NA
Total VOC as Hexane (C6-C12)	76600		2480		ppb v/v	24.77		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Client Sample ID: 20180906-M-SVE
Date Collected: 09/06/18 09:28
Date Received: 09/10/18 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-42983-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		124		ppb v/v			09/19/18 23:12	24.77
Benzene	**112**		9.91		ppb v/v			09/19/18 23:12	24.77
Benzyl chloride	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Bromodichloromethane	ND		7.43		ppb v/v			09/19/18 23:12	24.77
Bromoform	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Bromomethane	ND		19.8		ppb v/v			09/19/18 23:12	24.77
2-Butanone (MEK)	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Carbon disulfide	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Carbon tetrachloride	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Chlorobenzene	ND		7.43		ppb v/v			09/19/18 23:12	24.77
Dibromochloromethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Chloroethane	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Chloroform	ND		7.43		ppb v/v			09/19/18 23:12	24.77
Chloromethane	ND		19.8		ppb v/v			09/19/18 23:12	24.77
1,2-Dibromoethane (EDB)	ND		19.8		ppb v/v			09/19/18 23:12	24.77
1,2-Dichlorobenzene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,3-Dichlorobenzene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,4-Dichlorobenzene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Dichlorodifluoromethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,1-Dichloroethane	ND		7.43		ppb v/v			09/19/18 23:12	24.77
1,2-Dichloroethane	ND		19.8		ppb v/v			09/19/18 23:12	24.77
1,1-Dichloroethene	ND		19.8		ppb v/v			09/19/18 23:12	24.77
cis-1,2-Dichloroethene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
trans-1,2-Dichloroethene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,2-Dichloropropane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
cis-1,3-Dichloropropene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
trans-1,3-Dichloropropene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Ethylbenzene	**334**		9.91		ppb v/v			09/19/18 23:12	24.77
4-Ethyltoluene	**89.2**		9.91		ppb v/v			09/19/18 23:12	24.77
Hexachlorobutadiene	ND		49.5		ppb v/v			09/19/18 23:12	24.77
2-Hexanone	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Methylene Chloride	ND		9.91		ppb v/v			09/19/18 23:12	24.77
4-Methyl-2-pentanone (MIBK)	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Styrene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,1,2,2-Tetrachloroethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Tetrachloroethene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Toluene	**44.3**		9.91		ppb v/v			09/19/18 23:12	24.77
1,2,4-Trichlorobenzene	ND		49.5		ppb v/v			09/19/18 23:12	24.77
1,1,1-Trichloroethane	ND		7.43		ppb v/v			09/19/18 23:12	24.77
1,1,2-Trichloroethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Trichloroethene	ND		9.91		ppb v/v			09/19/18 23:12	24.77
Trichlorofluoromethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		9.91		ppb v/v			09/19/18 23:12	24.77
1,2,4-Trimethylbenzene	**134**		19.8		ppb v/v			09/19/18 23:12	24.77
1,3,5-Trimethylbenzene	**88.6**		9.91		ppb v/v			09/19/18 23:12	24.77
Vinyl acetate	ND		19.8		ppb v/v			09/19/18 23:12	24.77
Vinyl chloride	ND		9.91		ppb v/v			09/19/18 23:12	24.77

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Client Sample ID: 20180906-M-SVE
Date Collected: 09/06/18 09:28
Date Received: 09/10/18 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-42983-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	501		19.8		ppb v/v			09/19/18 23:12	24.77
o-Xylene	153		9.91		ppb v/v			09/19/18 23:12	24.77
Total VOC as Hexane (C6-C12)	76600		2480		ppb v/v			09/19/18 23:12	24.77

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*115*		*70 - 130*		*09/19/18 23:12*	*24.77*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*		*09/19/18 23:12*	*24.77*
Toluene-d8 (Surr)	*104*		*70 - 130*		*09/19/18 23:12*	*24.77*

Surrogate Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DCA	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-42983-1	20180906-M-SVE	115	106	104
LCS 320-246517/3	Lab Control Sample	118	112	106
LCSD 320-246517/4	Lab Control Sample Dup	118	110	105
MB 320-246517/7	Method Blank	113	108	110

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-246517/7
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.00		ppb v/v			09/19/18 16:03	1
Benzene	ND		0.400		ppb v/v			09/19/18 16:03	1
Benzyl chloride	ND		0.800		ppb v/v			09/19/18 16:03	1
Bromodichloromethane	ND		0.300		ppb v/v			09/19/18 16:03	1
Bromoform	ND		0.400		ppb v/v			09/19/18 16:03	1
Bromomethane	ND		0.800		ppb v/v			09/19/18 16:03	1
2-Butanone (MEK)	ND		0.800		ppb v/v			09/19/18 16:03	1
Carbon disulfide	ND		0.800		ppb v/v			09/19/18 16:03	1
Carbon tetrachloride	ND		0.800		ppb v/v			09/19/18 16:03	1
Chlorobenzene	ND		0.300		ppb v/v			09/19/18 16:03	1
Dibromochloromethane	ND		0.400		ppb v/v			09/19/18 16:03	1
Chloroethane	ND		0.800		ppb v/v			09/19/18 16:03	1
Chloroform	ND		0.300		ppb v/v			09/19/18 16:03	1
Chloromethane	ND		0.800		ppb v/v			09/19/18 16:03	1
1,2-Dibromoethane (EDB)	ND		0.800		ppb v/v			09/19/18 16:03	1
1,2-Dichlorobenzene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,3-Dichlorobenzene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,4-Dichlorobenzene	ND		0.400		ppb v/v			09/19/18 16:03	1
Dichlorodifluoromethane	ND		0.400		ppb v/v			09/19/18 16:03	1
1,1-Dichloroethane	ND		0.300		ppb v/v			09/19/18 16:03	1
1,2-Dichloroethane	ND		0.800		ppb v/v			09/19/18 16:03	1
1,1-Dichloroethene	ND		0.800		ppb v/v			09/19/18 16:03	1
cis-1,2-Dichloroethene	ND		0.400		ppb v/v			09/19/18 16:03	1
trans-1,2-Dichloroethene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,2-Dichloropropane	ND		0.400		ppb v/v			09/19/18 16:03	1
cis-1,3-Dichloropropene	ND		0.400		ppb v/v			09/19/18 16:03	1
trans-1,3-Dichloropropene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.400		ppb v/v			09/19/18 16:03	1
Ethylbenzene	ND		0.400		ppb v/v			09/19/18 16:03	1
4-Ethyltoluene	ND		0.400		ppb v/v			09/19/18 16:03	1
Hexachlorobutadiene	ND		2.00		ppb v/v			09/19/18 16:03	1
2-Hexanone	ND		0.400		ppb v/v			09/19/18 16:03	1
Methylene Chloride	ND		0.400		ppb v/v			09/19/18 16:03	1
4-Methyl-2-pentanone (MIBK)	ND		0.400		ppb v/v			09/19/18 16:03	1
Styrene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,1,2,2-Tetrachloroethane	ND		0.400		ppb v/v			09/19/18 16:03	1
Tetrachloroethene	ND		0.400		ppb v/v			09/19/18 16:03	1
Toluene	ND		0.400		ppb v/v			09/19/18 16:03	1
1,2,4-Trichlorobenzene	ND		2.00		ppb v/v			09/19/18 16:03	1
1,1,1-Trichloroethane	ND		0.300		ppb v/v			09/19/18 16:03	1
1,1,2-Trichloroethane	ND		0.400		ppb v/v			09/19/18 16:03	1
Trichloroethene	ND		0.400		ppb v/v			09/19/18 16:03	1
Trichlorofluoromethane	ND		0.400		ppb v/v			09/19/18 16:03	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.400		ppb v/v			09/19/18 16:03	1
1,2,4-Trimethylbenzene	ND		0.800		ppb v/v			09/19/18 16:03	1
1,3,5-Trimethylbenzene	ND		0.400		ppb v/v			09/19/18 16:03	1
Vinyl acetate	ND		0.800		ppb v/v			09/19/18 16:03	1
Vinyl chloride	ND		0.400		ppb v/v			09/19/18 16:03	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-246517/7
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.800		ppb v/v			09/19/18 16:03	1
o-Xylene	ND		0.400		ppb v/v			09/19/18 16:03	1
Total VOC as Hexane (C6-C12)	ND		100		ppb v/v			09/19/18 16:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*113*		*70 - 130*		*09/19/18 16:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*		*09/19/18 16:03*	*1*
Toluene-d8 (Surr)	*110*		*70 - 130*		*09/19/18 16:03*	*1*

Lab Sample ID: LCS 320-246517/3
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	23.22		ppb v/v		116	65 - 125
Benzene	20.0	20.91		ppb v/v		105	68 - 128
Benzyl chloride	16.0	17.80		ppb v/v		111	67 - 127
Bromodichloromethane	20.0	21.45		ppb v/v		107	71 - 131
Bromoform	20.0	20.81		ppb v/v		104	66 - 126
Bromomethane	20.0	20.19		ppb v/v		101	73 - 134
2-Butanone (MEK)	20.0	20.74		ppb v/v		104	73 - 133
Carbon disulfide	20.0	20.41		ppb v/v		102	71 - 131
Carbon tetrachloride	20.0	22.06		ppb v/v		110	63 - 126
Chlorobenzene	20.0	19.51		ppb v/v		98	63 - 123
Dibromochloromethane	20.0	20.73		ppb v/v		104	66 - 126
Chloroethane	20.0	21.62		ppb v/v		108	73 - 133
Chloroform	20.0	21.02		ppb v/v		105	70 - 130
Chloromethane	20.0	20.96		ppb v/v		105	61 - 140
1,2-Dibromoethane (EDB)	20.0	20.33		ppb v/v		102	64 - 124
1,2-Dichlorobenzene	20.0	20.87		ppb v/v		104	62 - 126
1,3-Dichlorobenzene	20.0	20.73		ppb v/v		104	59 - 130
1,4-Dichlorobenzene	20.0	20.99		ppb v/v		105	58 - 132
Dichlorodifluoromethane	20.0	21.26		ppb v/v		106	69 - 129
1,1-Dichloroethane	20.0	21.56		ppb v/v		108	71 - 131
1,2-Dichloroethane	20.0	22.42		ppb v/v		112	71 - 131
1,1-Dichloroethene	20.0	21.76		ppb v/v		109	72 - 132
cis-1,2-Dichloroethene	20.0	20.41		ppb v/v		102	70 - 130
trans-1,2-Dichloroethene	20.0	21.28		ppb v/v		106	72 - 132
1,2-Dichloropropane	20.0	22.47		ppb v/v		112	72 - 132
cis-1,3-Dichloropropene	20.0	21.09		ppb v/v		105	72 - 132
trans-1,3-Dichloropropene	20.0	21.17		ppb v/v		106	66 - 126
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	20.81		ppb v/v		104	74 - 134
Ethylbenzene	20.0	20.61		ppb v/v		103	64 - 124
4-Ethyltoluene	20.0	20.68		ppb v/v		103	66 - 129
Hexachlorobutadiene	20.0	20.34		ppb v/v		102	58 - 131
2-Hexanone	20.0	21.50		ppb v/v		108	69 - 129
Methylene Chloride	20.0	22.52		ppb v/v		113	67 - 127

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-246517/3
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
4-Methyl-2-pentanone (MIBK)			20.0	23.43		ppb v/v		117	74 - 134		
Styrene			20.0	20.29		ppb v/v		101	67 - 127		
1,1,2,2-Tetrachloroethane			20.0	20.39		ppb v/v		102	64 - 124		
Tetrachloroethene			20.0	20.55		ppb v/v		103	63 - 123		
Toluene			20.0	20.55		ppb v/v		103	68 - 128		
1,2,4-Trichlorobenzene			20.0	19.60		ppb v/v		98	58 - 138		
1,1,1-Trichloroethane			20.0	21.41		ppb v/v		107	69 - 129		
1,1,2-Trichloroethane			20.0	20.62		ppb v/v		103	64 - 124		
Trichloroethene			20.0	20.60		ppb v/v		103	70 - 130		
Trichlorofluoromethane			20.0	21.27		ppb v/v		106	71 - 131		
1,1,2-Trichloro-1,2,2-trifluoroethane			20.0	20.52		ppb v/v		103	70 - 130		
1,2,4-Trimethylbenzene			20.0	21.50		ppb v/v		107	60 - 132		
1,3,5-Trimethylbenzene			20.0	20.89		ppb v/v		104	65 - 125		
Vinyl acetate			20.0	22.87		ppb v/v		114	65 - 134		
Vinyl chloride			20.0	21.73		ppb v/v		109	59 - 152		
Hexane			20.0	22.86		ppb v/v		114	70 - 130		
m,p-Xylene			40.0	41.45		ppb v/v		104	65 - 125		
o-Xylene			20.0	21.32		ppb v/v		107	65 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*118*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 130*
Toluene-d8 (Surr)	*106*		*70 - 130*

Lab Sample ID: LCSD 320-246517/4
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			20.0	23.16		ppb v/v		116	65 - 125	0	25
Benzene			20.0	20.70		ppb v/v		103	68 - 128	1	25
Benzyl chloride			16.0	17.46		ppb v/v		109	67 - 127	2	25
Bromodichloromethane			20.0	21.10		ppb v/v		105	71 - 131	2	25
Bromoform			20.0	20.67		ppb v/v		103	66 - 126	1	25
Bromomethane			20.0	20.61		ppb v/v		103	73 - 134	2	25
2-Butanone (MEK)			20.0	20.63		ppb v/v		103	73 - 133	1	25
Carbon disulfide			20.0	20.35		ppb v/v		102	71 - 131	0	25
Carbon tetrachloride			20.0	21.74		ppb v/v		109	63 - 126	1	25
Chlorobenzene			20.0	19.52		ppb v/v		98	63 - 123	0	25
Dibromochloromethane			20.0	20.58		ppb v/v		103	66 - 126	1	25
Chloroethane			20.0	21.76		ppb v/v		109	73 - 133	1	25
Chloroform			20.0	20.79		ppb v/v		104	70 - 130	1	25
Chloromethane			20.0	21.39		ppb v/v		107	61 - 140	2	25
1,2-Dibromoethane (EDB)			20.0	20.33		ppb v/v		102	64 - 124	0	25
1,2-Dichlorobenzene			20.0	20.37		ppb v/v		102	62 - 126	2	25
1,3-Dichlorobenzene			20.0	20.36		ppb v/v		102	59 - 130	2	25
1,4-Dichlorobenzene			20.0	20.62		ppb v/v		103	58 - 132	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-246517/4
Matrix: Air
Analysis Batch: 246517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane			20.0	20.93		ppb v/v		105	69 - 129	2	25
1,1-Dichloroethane			20.0	21.42		ppb v/v		107	71 - 131	1	25
1,2-Dichloroethane			20.0	22.05		ppb v/v		110	71 - 131	2	25
1,1-Dichloroethene			20.0	21.58		ppb v/v		108	72 - 132	1	25
cis-1,2-Dichloroethene			20.0	20.37		ppb v/v		102	70 - 130	0	25
trans-1,2-Dichloroethene			20.0	21.30		ppb v/v		107	72 - 132	0	25
1,2-Dichloropropane			20.0	22.24		ppb v/v		111	72 - 132	1	25
cis-1,3-Dichloropropene			20.0	20.71		ppb v/v		104	72 - 132	2	25
trans-1,3-Dichloropropene			20.0	21.14		ppb v/v		106	66 - 126	0	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			20.0	20.49		ppb v/v		102	74 - 134	2	25
Ethylbenzene			20.0	20.53		ppb v/v		103	64 - 124	0	25
4-Ethyltoluene			20.0	20.23		ppb v/v		101	66 - 129	2	25
Hexachlorobutadiene			20.0	19.94		ppb v/v		100	58 - 131	2	25
2-Hexanone			20.0	21.56		ppb v/v		108	69 - 129	0	25
Methylene Chloride			20.0	22.39		ppb v/v		112	67 - 127	1	25
4-Methyl-2-pentanone (MIBK)			20.0	22.94		ppb v/v		115	74 - 134	2	25
Styrene			20.0	20.39		ppb v/v		102	67 - 127	0	25
1,1,2,2-Tetrachloroethane			20.0	20.42		ppb v/v		102	64 - 124	0	25
Tetrachloroethene			20.0	20.43		ppb v/v		102	63 - 123	1	25
Toluene			20.0	20.26		ppb v/v		101	68 - 128	1	25
1,2,4-Trichlorobenzene			20.0	19.07		ppb v/v		95	58 - 138	3	25
1,1,1-Trichloroethane			20.0	21.08		ppb v/v		105	69 - 129	2	25
1,1,2-Trichloroethane			20.0	20.53		ppb v/v		103	64 - 124	0	25
Trichloroethene			20.0	20.38		ppb v/v		102	70 - 130	1	25
Trichlorofluoromethane			20.0	21.25		ppb v/v		106	71 - 131	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane			20.0	20.45		ppb v/v		102	70 - 130	0	25
1,2,4-Trimethylbenzene			20.0	20.58		ppb v/v		103	60 - 132	4	25
1,3,5-Trimethylbenzene			20.0	19.27		ppb v/v		96	65 - 125	8	25
Vinyl acetate			20.0	22.50		ppb v/v		112	65 - 134	2	25
Vinyl chloride			20.0	22.05		ppb v/v		110	59 - 152	1	25
Hexane			20.0	22.49		ppb v/v		112	70 - 130	2	25
m,p-Xylene			40.0	41.53		ppb v/v		104	65 - 125	0	25
o-Xylene			20.0	21.38		ppb v/v		107	65 - 125	0	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*118*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*110*		*70 - 130*
Toluene-d8 (Surr)	*105*		*70 - 130*

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Air - GC/MS VOA

Analysis Batch: 246517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-42983-1	20180906-M-SVE	Total/NA	Air	TO-15	
MB 320-246517/7	Method Blank	Total/NA	Air	TO-15	
LCS 320-246517/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-246517/4	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Client Sample ID: 20180906-M-SVE
Date Collected: 09/06/18 09:28
Date Received: 09/10/18 09:15

Lab Sample ID: 320-42983-1
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		24.77	16.6 mL	250 mL	246517	09/19/18 23:12	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

Method Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 320-42983-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-42983-1	20180906-M-SVE	Air	09/06/18 09:28	09/10/18 09:15

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

CHAIN OF CUSTODY RECORD

No. 04392

PROJECT NUMBER: CHKHSTM1Ø1	PROJECT NAME: CHK STATE M	COC 1 of 1
SHIPPED TO: TA-32Ø	PROJECT MANAGER: DAVID BRADY	TAT: STANDARD

SAMPLER'S PRINTED NAME:

SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	TO-15	TOTAL VOCs AS HEXANE	REMARKS
9-6-18	0928	20180906-M-SVE	AIR	1	X	X	TAG # / CAN # > 34ØØØ4Ø4

320-42983 Chain of Custody

TOTAL NUMBER OF CONTAINERS → 1

RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME
[signature]	DATE 9-6-18 TIME 1600	Emily James TA-SAC	DATE 9/10/18 TIME 9:15
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FEDEX

AIRBILL NUMBER:

RECEIVED IN LABORATORY BY: DATE TIME

Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at julie.czech@eccgrp.com

LABORATORY CONTACT: 615-301-5041

LABORATORY ADDRESS: 88Ø RIVERSIDE PARKWAY W. SACRAMENTO, CA 95605

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB PAGE #2 - ENVIRO CLEAN PROJECT FILE PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 320-42983-1
SDG Number: Property ID: 891077

Login Number: 42983
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: B 08-09-18

Date of QC: 8/14/18

320-41941 Chain of Custody

Data File Number: C:\MSDCHEM\1\DATA\180814\
(File ID for certification analysis of canister designated below)

CANISTER ID NUMBERS

*	34000504 0815r18081423.d
	8239
	34000887
	8017
	34000239
	34001558
	34000189
	34000404
	34002133
	34001140
	34000298
	7791

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED

1st Level Reviewed By — Date: 8/15/18

2nd Level Reviewed By — Date: 8/20/18

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41941-1

SDG No.:

Client Sample ID: 34000504 Lab Sample ID: 320-41941-1

Matrix: Air Lab File ID: MS618081423.D

Analysis Method: TO-15 Date Collected: 08/09/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 08/15/2018 09:46

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 239840 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	1.2	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	0.50	J	0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41941-1

SDG No.:

Client Sample ID: 34000504 Lab Sample ID: 320-41941-1

Matrix: Air Lab File ID: MS618081423.D

Analysis Method: TO-15 Date Collected: 08/09/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 08/15/2018 09:46

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 239840 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	0.10	J	0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	0.15	J B	0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41941-1

SDG No.:

Client Sample ID: 34000504 Lab Sample ID: 320-41941-1

Matrix: Air Lab File ID: MS618081423.D

Analysis Method: TO-15 Date Collected: 08/09/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 08/15/2018 09:46

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 239840 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074
87-61-6	1,2,3-Trichlorobenzene	ND		2.0	0.62
60-29-7	Ethyl ether	ND		0.80	0.20
71-36-3	n-Butanol	ND		2.0	0.26
111-84-2	n-Nonane	ND		0.80	0.058

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	108		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		70-130
2037-26-5	Toluene-d8 (Surr)	100		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D
Lims ID: 320-41941-A-1
Client ID: 34000504
Sample Type: Client
Inject. Date: 15-Aug-2018 09:46:30 ALS Bottle#: 13 Worklist Smp#: 21
Purge Vol: 25.000 mL Dil. Factor: 1.0000
Sample Info: 320-41941-A-1
Misc. Info.: 500 mL CAN CERT
Operator ID: LHS Instrument ID: ATMS6

Method: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\TO15_ATMS6.m
Limit Group: MSA - TO15 - ICAL
Last Update: 15-Aug-2018 12:44:17 Calib Date: 14-Aug-2018 18:17:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081407.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK001

First Level Reviewer: leeh Date: 15-Aug-2018 12:40:05

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	11.030	11.036	-0.006	92	42801	4.00	
* 2 1,4-Difluorobenzene	114	13.196	13.202	-0.006	96	164675	4.00	
* 3 Chlorobenzene-d5 (IS)	117	19.967	19.967	0.000	91	124629	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	12.234	12.240	-0.007	41	65566	4.26	
$ 5 Toluene-d8 (Surr)	100	16.596	16.596	-0.001	98	95696	3.98	
$ 6 4-Bromofluorobenzene (Surr	95	22.589	22.589	0.000	0	63280	4.31	
11 Propene	41	3.176	3.192	-0.018	96	2953	0.1540	
13 Dichlorodifluoromethane	85	3.237	3.253	-0.018	96	2363	0.0801	
14 1,2-Dichloro-1,1,2,2-tetra	135	3.456	3.472	-0.018	89	891	0.0516	
26 Trichlorofluoromethane	101	5.372	5.387	-0.018	73	941	0.0357	
32 Acetone	43	6.248	6.269	-0.025	99	29174	1.21	
39 Methylene Chloride	49	7.514	7.533	-0.024	94	2290	0.1026	
40 Carbon disulfide	76	7.532	7.552	-0.024	95	11556	0.5014	

Reagents:

VAMSIS20_00206 Amount Added: 50.00 Units: mL Run Reagent

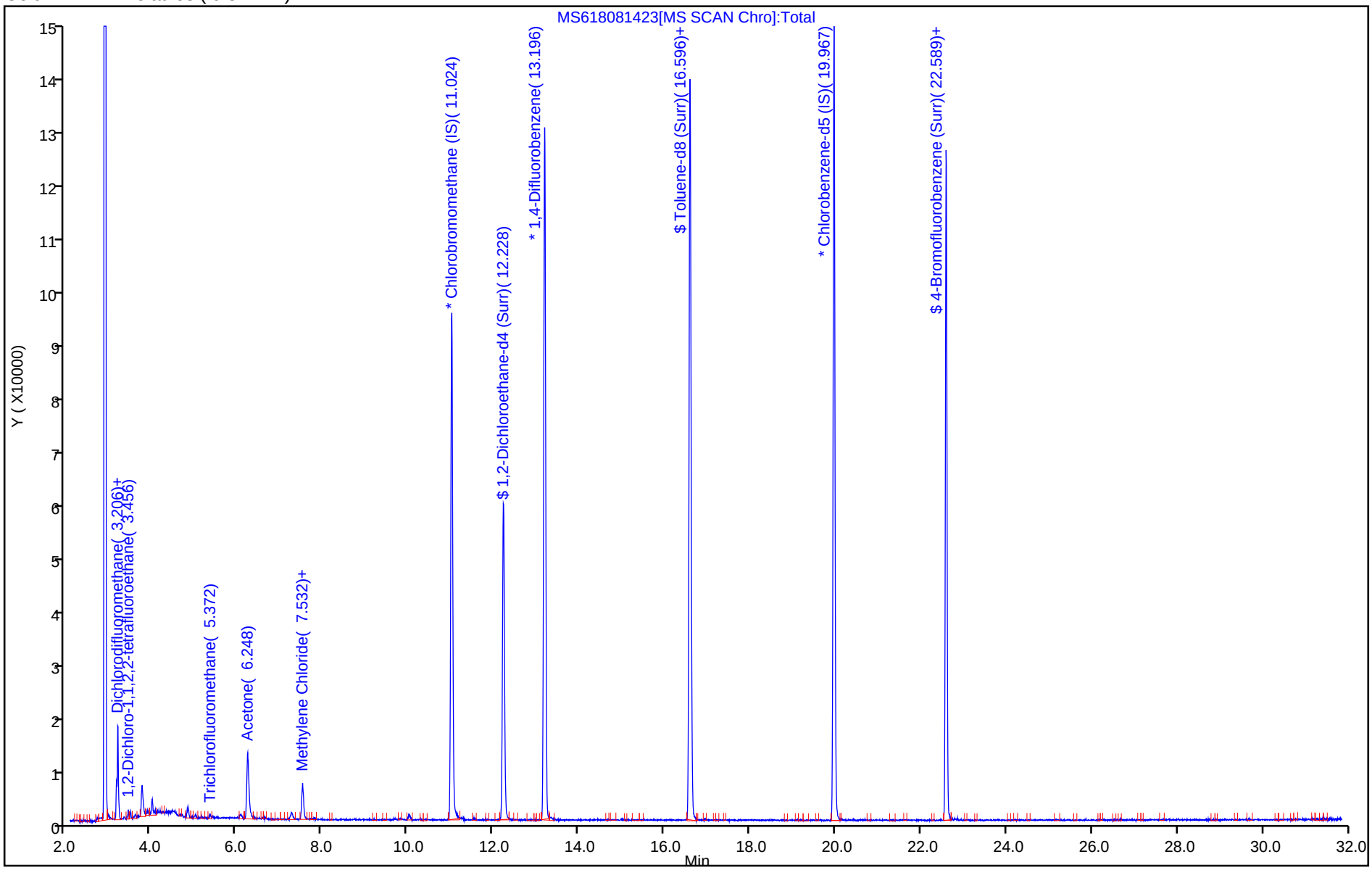
Report Date: 15-Aug-2018 12:44:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D

Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6	Operator ID:	LHS
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1	Worklist Smp#:	21
Client ID:	34000504				
Purge Vol:	25.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	13
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



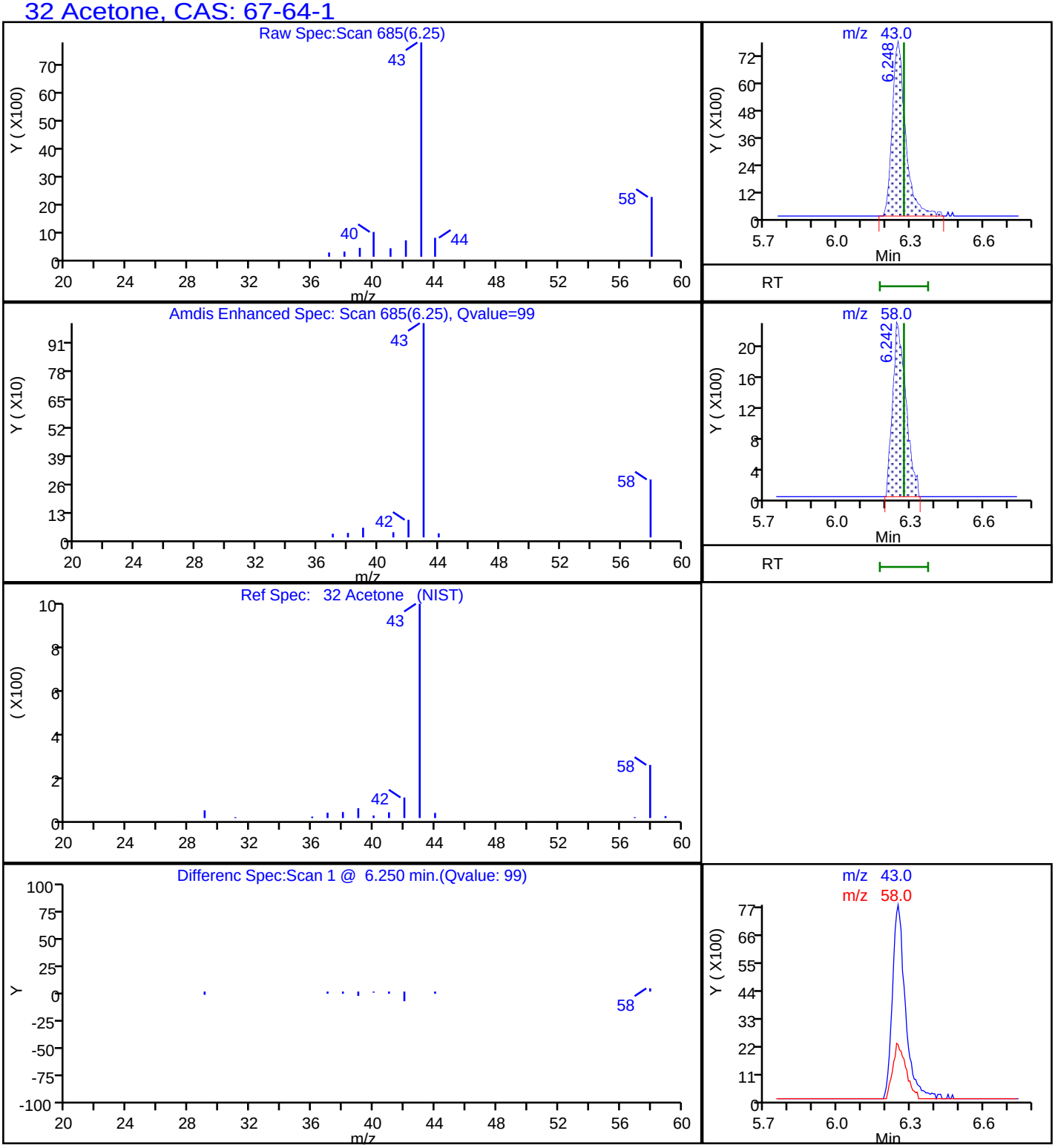
Report Date: 15-Aug-2018 12:44:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D

Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1



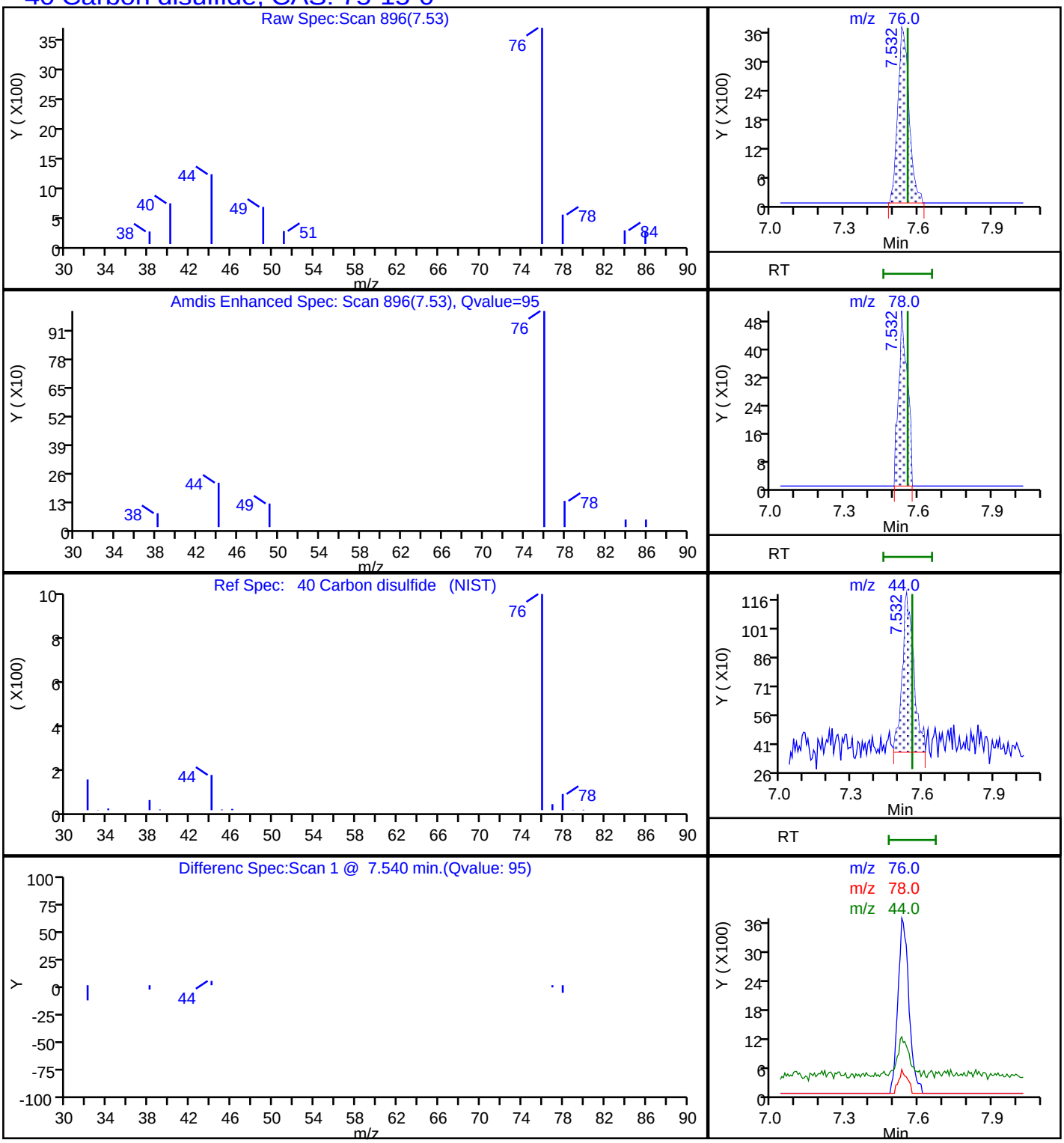
Report Date: 15-Aug-2018 12:44:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D

Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

40 Carbon disulfide, CAS: 75-15-0



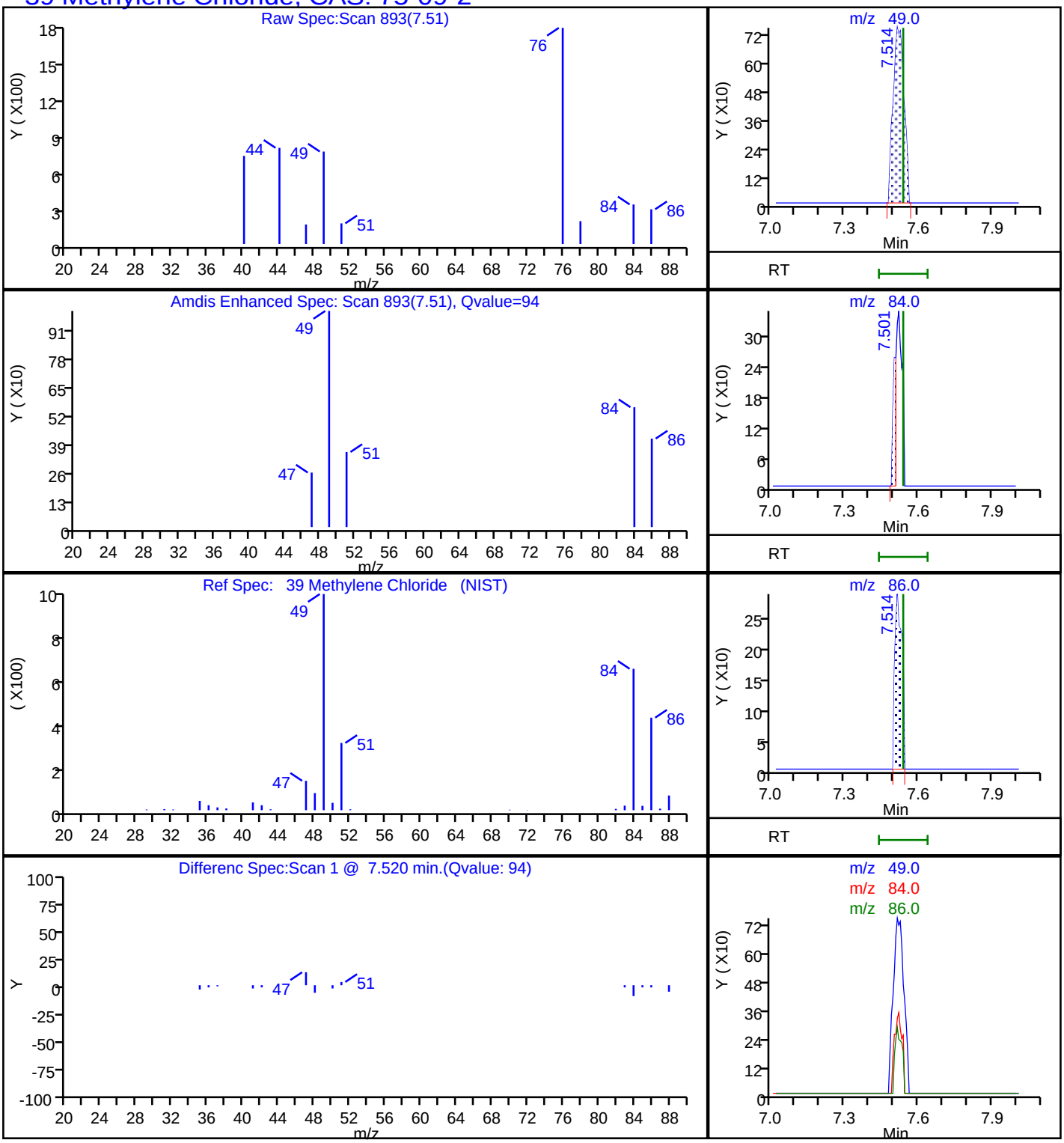
Report Date: 15-Aug-2018 12:44:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D

Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

39 Methylene Chloride, CAS: 75-09-2



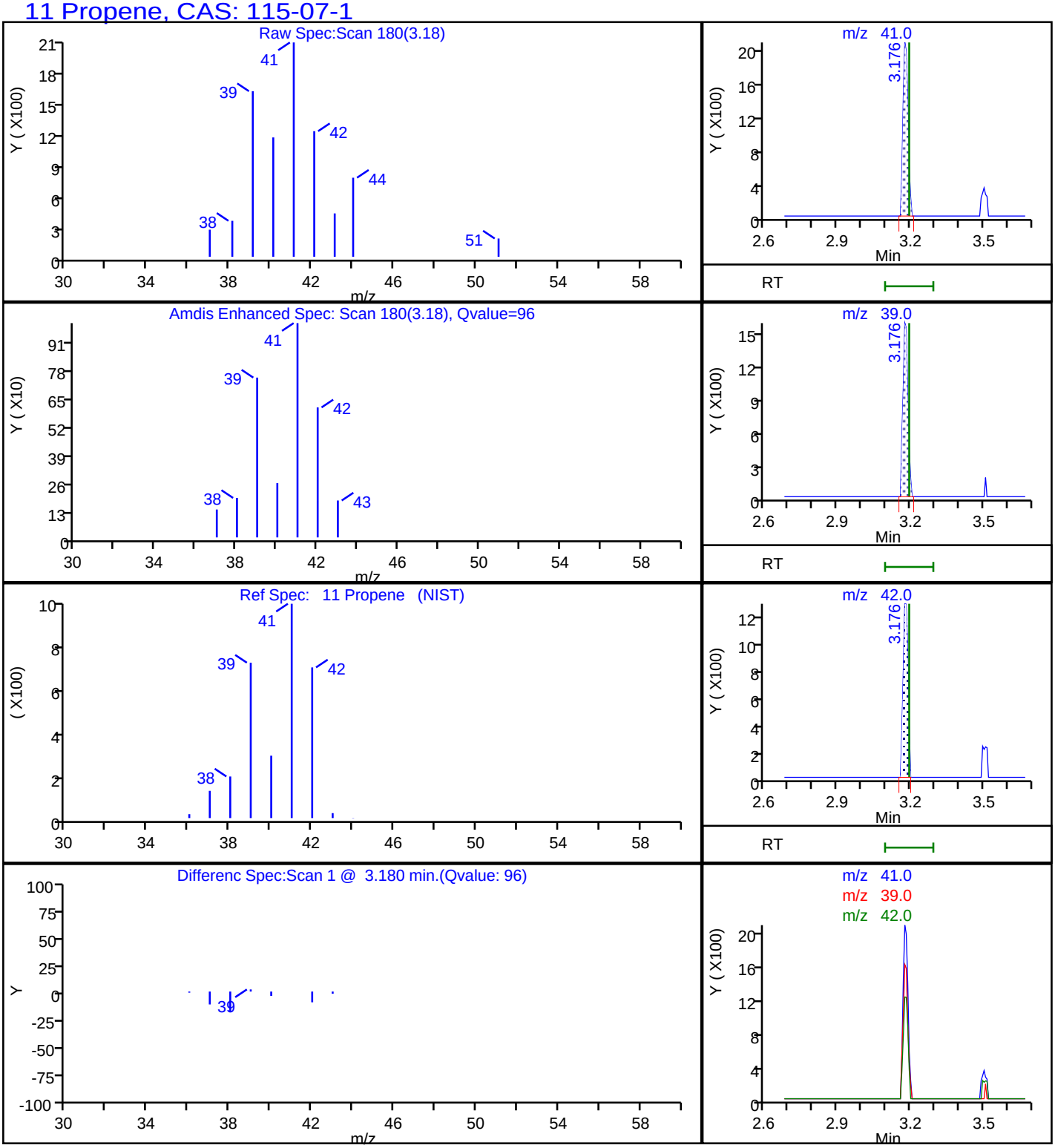
Report Date: 15-Aug-2018 12:44:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D

Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

11 Propene, CAS: 115-07-1



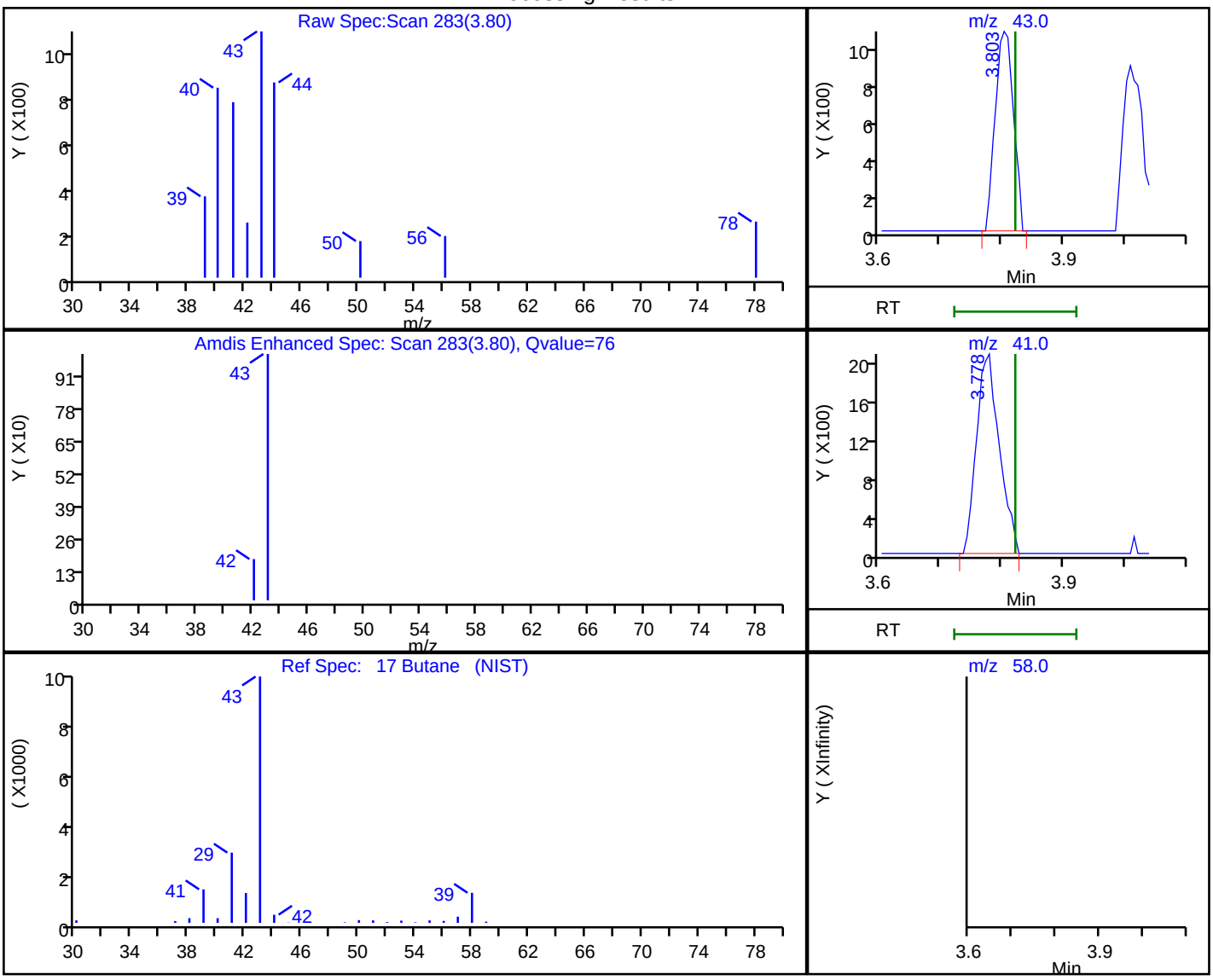
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D				
Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

17 Butane, CAS: 106-97-8

Processing Results



RT	Mass	Response	Amount
3.80	43.00	2124	0.078183
3.78	41.00	5408	
3.82	58.00	0	

Reviewer: leeh, 15-Aug-2018 12:39:37

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

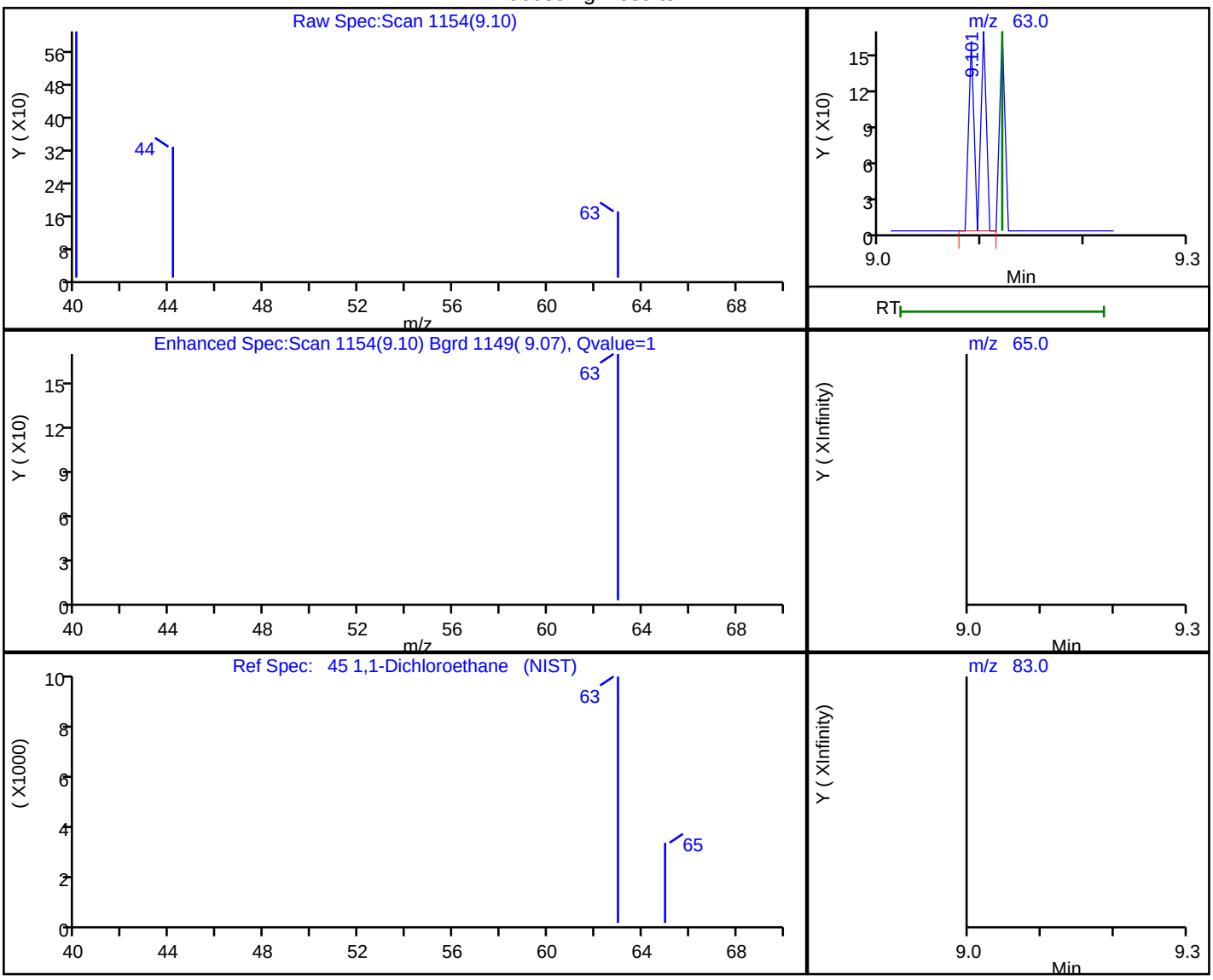
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D				
Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

45 1,1-Dichloroethane, CAS: 75-34-3

Processing Results



RT	Mass	Response	Amount
9.10	63.00	115	0.004946
9.12	65.00	0	
9.12	83.00	0	

Reviewer: leeh, 15-Aug-2018 12:39:16

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

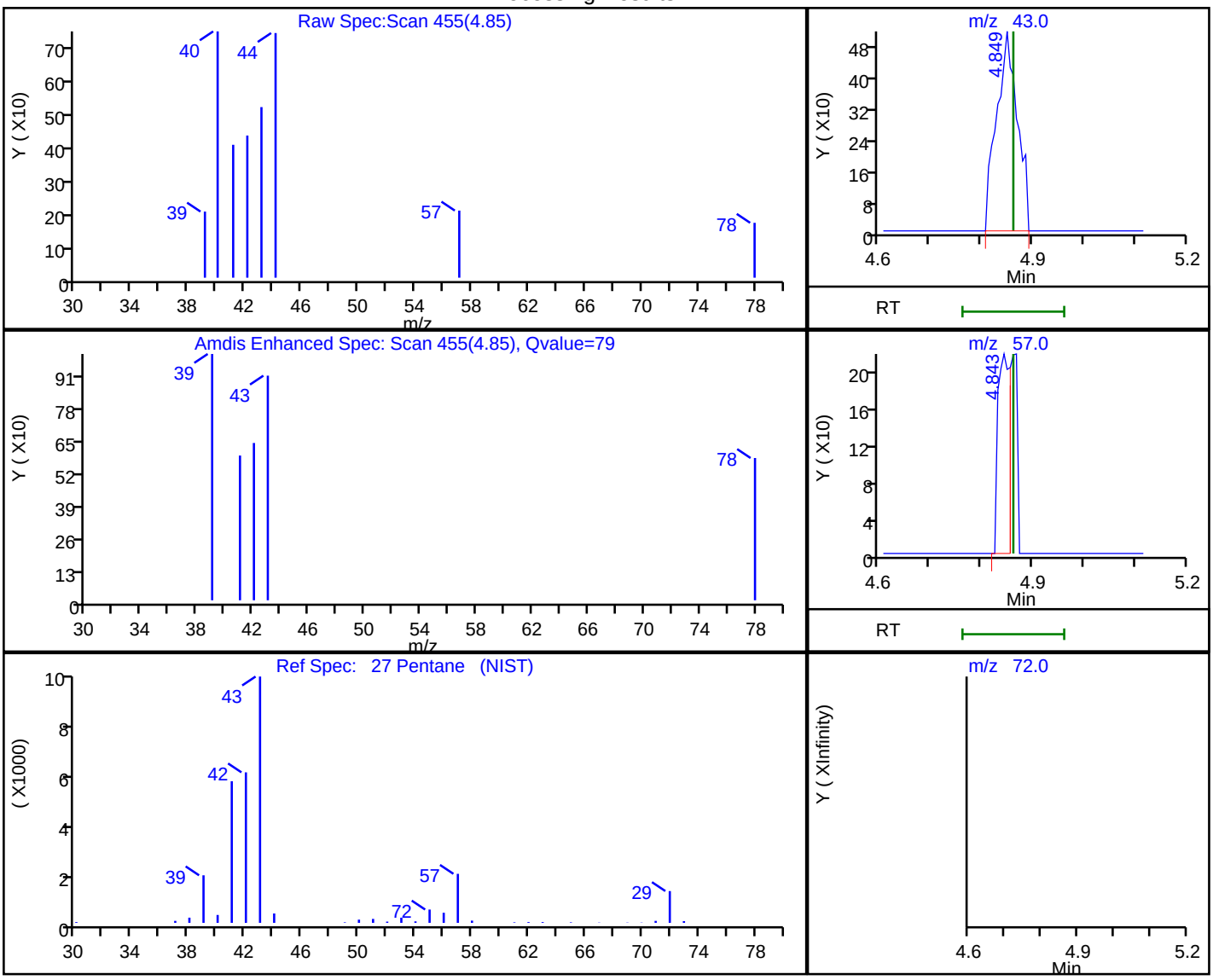
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D				
Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

27 Pentane, CAS: 109-66-0

Processing Results



RT	Mass	Response	Amount
4.85	43.00	1468	0.067699
4.84	57.00	370	
4.86	72.00	0	

Reviewer: leeh, 15-Aug-2018 12:39:40

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

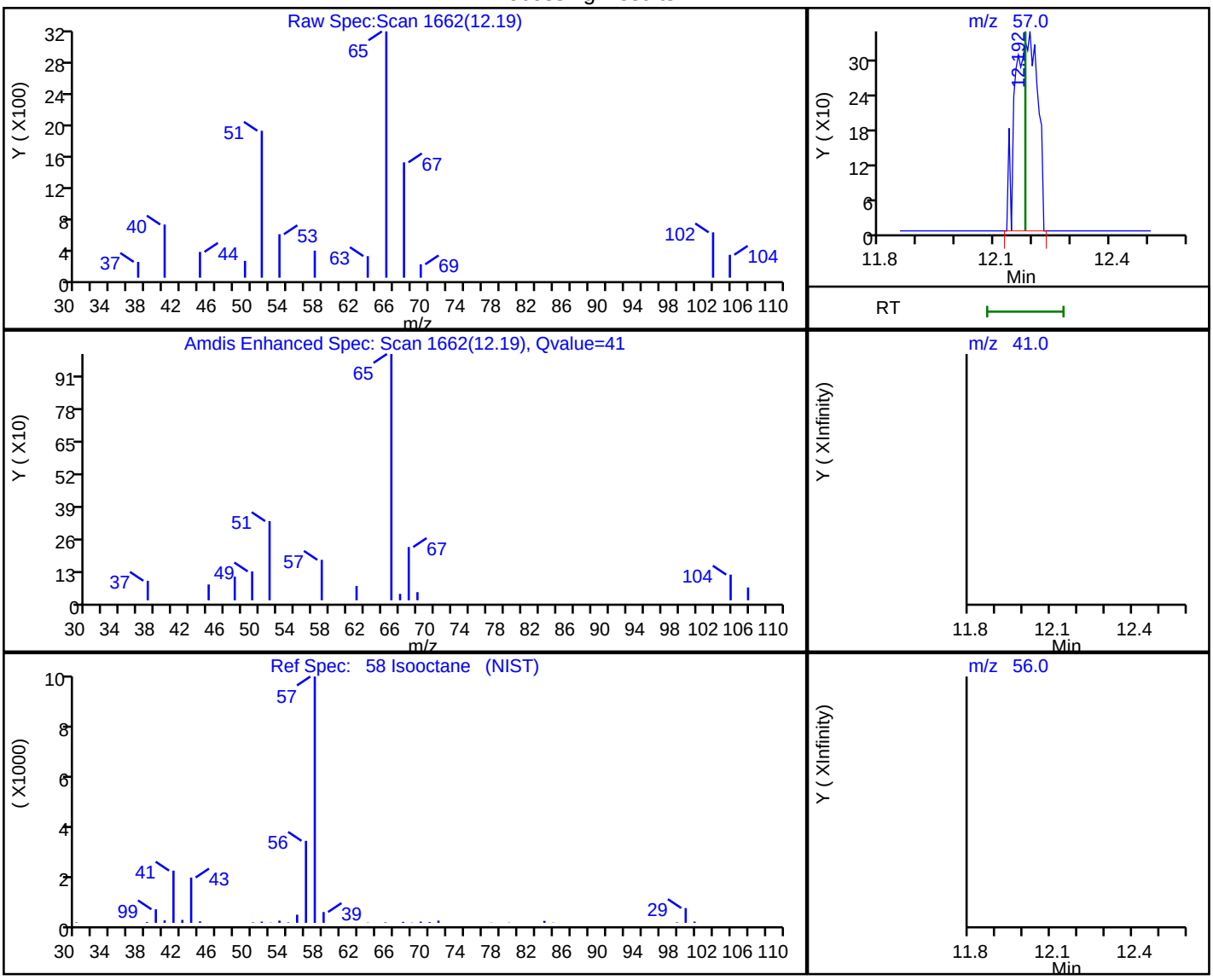
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS6\20180814-62684.b\MS618081423.D				
Injection Date:	15-Aug-2018 09:46:30	Instrument ID:	ATMS6		
Lims ID:	320-41941-A-1	Lab Sample ID:	320-41941-1		
Client ID:	34000504				
Operator ID:	LHS	ALS Bottle#:	13	Worklist Smp#:	21
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

58 Isooctane, CAS: 540-84-1

Processing Results



RT	Mass	Response	Amount
12.19	57.00	1393	0.017060
12.18	41.00	0	
12.18	56.00	0	

Reviewer: leeh, 15-Aug-2018 12:39:47

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-46208-1
TestAmerica Sample Delivery Group: Property ID 891077
Client Project/Site: State M

For:
Chesapeake Energy Corporation
PO BOX 548806
Oklahoma City, Oklahoma 73154

Attn: Chase Acker

Cathy Gartner

Authorized for release by:
1/2/2019 4:06:41 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-46208-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-46208-1

Comments
No additional comments.

Receipt
The sample was received on 12/17/2018 9:20 AM; the sample arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Client Sample ID: 20181211-M-SVE

Lab Sample ID: 320-46208-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	137		14.2		ppb v/v	35.5		TO-15	Total/NA
Ethylbenzene	363		14.2		ppb v/v	35.5		TO-15	Total/NA
4-Ethyltoluene	76.7		14.2		ppb v/v	35.5		TO-15	Total/NA
Toluene	41.0		14.2		ppb v/v	35.5		TO-15	Total/NA
1,2,4-Trimethylbenzene	124		28.4		ppb v/v	35.5		TO-15	Total/NA
1,3,5-Trimethylbenzene	102		14.2		ppb v/v	35.5		TO-15	Total/NA
m,p-Xylene	544		28.4		ppb v/v	35.5		TO-15	Total/NA
o-Xylene	158		14.2		ppb v/v	35.5		TO-15	Total/NA
Total VOC as Hexane (C6-C12)	107000		3550		ppb v/v	35.5		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Client Sample ID: 20181211-M-SVE
Date Collected: 12/11/18 14:50
Date Received: 12/17/18 09:20
Sample Container: Summa Canister 6L

Lab Sample ID: 320-46208-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		178		ppb v/v			12/28/18 02:58	35.5
Benzene	**137**		14.2		ppb v/v			12/28/18 02:58	35.5
Benzyl chloride	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Bromodichloromethane	ND		10.7		ppb v/v			12/28/18 02:58	35.5
Bromoform	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Bromomethane	ND		28.4		ppb v/v			12/28/18 02:58	35.5
2-Butanone (MEK)	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Carbon disulfide	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Carbon tetrachloride	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Chlorobenzene	ND		10.7		ppb v/v			12/28/18 02:58	35.5
Dibromochloromethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Chloroethane	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Chloroform	ND		10.7		ppb v/v			12/28/18 02:58	35.5
Chloromethane	ND		28.4		ppb v/v			12/28/18 02:58	35.5
1,2-Dibromoethane (EDB)	ND		28.4		ppb v/v			12/28/18 02:58	35.5
1,2-Dichlorobenzene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,3-Dichlorobenzene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,4-Dichlorobenzene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Dichlorodifluoromethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,1-Dichloroethane	ND		10.7		ppb v/v			12/28/18 02:58	35.5
1,2-Dichloroethane	ND		28.4		ppb v/v			12/28/18 02:58	35.5
1,1-Dichloroethene	ND		28.4		ppb v/v			12/28/18 02:58	35.5
cis-1,2-Dichloroethene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
trans-1,2-Dichloroethene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,2-Dichloropropane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
cis-1,3-Dichloropropene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
trans-1,3-Dichloropropene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Ethylbenzene	**363**		14.2		ppb v/v			12/28/18 02:58	35.5
4-Ethyltoluene	**76.7**		14.2		ppb v/v			12/28/18 02:58	35.5
Hexachlorobutadiene	ND		71.0		ppb v/v			12/28/18 02:58	35.5
2-Hexanone	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Methylene Chloride	ND		14.2		ppb v/v			12/28/18 02:58	35.5
4-Methyl-2-pentanone (MIBK)	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Styrene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,1,2,2-Tetrachloroethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Tetrachloroethene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Toluene	**41.0**		14.2		ppb v/v			12/28/18 02:58	35.5
1,2,4-Trichlorobenzene	ND		71.0		ppb v/v			12/28/18 02:58	35.5
1,1,1-Trichloroethane	ND		10.7		ppb v/v			12/28/18 02:58	35.5
1,1,2-Trichloroethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Trichloroethene	ND		14.2		ppb v/v			12/28/18 02:58	35.5
Trichlorofluoromethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		14.2		ppb v/v			12/28/18 02:58	35.5
1,2,4-Trimethylbenzene	**124**		28.4		ppb v/v			12/28/18 02:58	35.5
1,3,5-Trimethylbenzene	**102**		14.2		ppb v/v			12/28/18 02:58	35.5
Vinyl acetate	ND		28.4		ppb v/v			12/28/18 02:58	35.5
Vinyl chloride	ND		14.2		ppb v/v			12/28/18 02:58	35.5

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Client Sample ID: 20181211-M-SVE
Date Collected: 12/11/18 14:50
Date Received: 12/17/18 09:20
Sample Container: Summa Canister 6L

Lab Sample ID: 320-46208-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	544		28.4		ppb v/v			12/28/18 02:58	35.5
o-Xylene	158		14.2		ppb v/v			12/28/18 02:58	35.5
Total VOC as Hexane (C6-C12)	107000		3550		ppb v/v			12/28/18 02:58	35.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*12/28/18 02:58*	*35.5*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*12/28/18 02:58*	*35.5*
Toluene-d8 (Surr)	*100*		*70 - 130*		*12/28/18 02:58*	*35.5*

Surrogate Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DCA	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-46208-1	20181211-M-SVE	99	98	100
LCS 320-267620/3	Lab Control Sample	104	97	102
LCSD 320-267620/4	Lab Control Sample Dup	106	91	101
MB 320-267620/6	Method Blank	96	89	99

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-267620/6
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.00		ppb v/v			12/27/18 13:55	1
Benzene	ND		0.400		ppb v/v			12/27/18 13:55	1
Benzyl chloride	ND		0.800		ppb v/v			12/27/18 13:55	1
Bromodichloromethane	ND		0.300		ppb v/v			12/27/18 13:55	1
Bromoform	ND		0.400		ppb v/v			12/27/18 13:55	1
Bromomethane	ND		0.800		ppb v/v			12/27/18 13:55	1
2-Butanone (MEK)	ND		0.800		ppb v/v			12/27/18 13:55	1
Carbon disulfide	ND		0.800		ppb v/v			12/27/18 13:55	1
Carbon tetrachloride	ND		0.800		ppb v/v			12/27/18 13:55	1
Chlorobenzene	ND		0.300		ppb v/v			12/27/18 13:55	1
Dibromochloromethane	ND		0.400		ppb v/v			12/27/18 13:55	1
Chloroethane	ND		0.800		ppb v/v			12/27/18 13:55	1
Chloroform	ND		0.300		ppb v/v			12/27/18 13:55	1
Chloromethane	ND		0.800		ppb v/v			12/27/18 13:55	1
1,2-Dibromoethane (EDB)	ND		0.800		ppb v/v			12/27/18 13:55	1
1,2-Dichlorobenzene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,3-Dichlorobenzene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,4-Dichlorobenzene	ND		0.400		ppb v/v			12/27/18 13:55	1
Dichlorodifluoromethane	ND		0.400		ppb v/v			12/27/18 13:55	1
1,1-Dichloroethane	ND		0.300		ppb v/v			12/27/18 13:55	1
1,2-Dichloroethane	ND		0.800		ppb v/v			12/27/18 13:55	1
1,1-Dichloroethene	ND		0.800		ppb v/v			12/27/18 13:55	1
cis-1,2-Dichloroethene	ND		0.400		ppb v/v			12/27/18 13:55	1
trans-1,2-Dichloroethene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,2-Dichloropropane	ND		0.400		ppb v/v			12/27/18 13:55	1
cis-1,3-Dichloropropene	ND		0.400		ppb v/v			12/27/18 13:55	1
trans-1,3-Dichloropropene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.400		ppb v/v			12/27/18 13:55	1
Ethylbenzene	ND		0.400		ppb v/v			12/27/18 13:55	1
4-Ethyltoluene	ND		0.400		ppb v/v			12/27/18 13:55	1
Hexachlorobutadiene	ND		2.00		ppb v/v			12/27/18 13:55	1
2-Hexanone	ND		0.400		ppb v/v			12/27/18 13:55	1
Methylene Chloride	ND		0.400		ppb v/v			12/27/18 13:55	1
4-Methyl-2-pentanone (MIBK)	ND		0.400		ppb v/v			12/27/18 13:55	1
Styrene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,1,2,2-Tetrachloroethane	ND		0.400		ppb v/v			12/27/18 13:55	1
Tetrachloroethene	ND		0.400		ppb v/v			12/27/18 13:55	1
Toluene	ND		0.400		ppb v/v			12/27/18 13:55	1
1,2,4-Trichlorobenzene	ND		2.00		ppb v/v			12/27/18 13:55	1
1,1,1-Trichloroethane	ND		0.300		ppb v/v			12/27/18 13:55	1
1,1,2-Trichloroethane	ND		0.400		ppb v/v			12/27/18 13:55	1
Trichloroethene	ND		0.400		ppb v/v			12/27/18 13:55	1
Trichlorofluoromethane	ND		0.400		ppb v/v			12/27/18 13:55	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.400		ppb v/v			12/27/18 13:55	1
1,2,4-Trimethylbenzene	ND		0.800		ppb v/v			12/27/18 13:55	1
1,3,5-Trimethylbenzene	ND		0.400		ppb v/v			12/27/18 13:55	1
Vinyl acetate	ND		0.800		ppb v/v			12/27/18 13:55	1
Vinyl chloride	ND		0.400		ppb v/v			12/27/18 13:55	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-267620/6
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.800		ppb v/v			12/27/18 13:55	1
o-Xylene	ND		0.400		ppb v/v			12/27/18 13:55	1
Total VOC as Hexane (C6-C12)	ND		100		ppb v/v			12/27/18 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*		*12/27/18 13:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*12/27/18 13:55*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*12/27/18 13:55*	*1*

Lab Sample ID: LCS 320-267620/3
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	21.2	20.18		ppb v/v		95	65 - 125
Benzene	21.3	21.98		ppb v/v		103	68 - 128
Benzyl chloride	21.0	16.01		ppb v/v		76	67 - 127
Bromodichloromethane	21.1	21.86		ppb v/v		104	71 - 131
Bromoform	21.1	20.86		ppb v/v		99	66 - 126
Bromomethane	21.1	22.20		ppb v/v		105	73 - 134
2-Butanone (MEK)	21.2	21.54		ppb v/v		102	73 - 133
Carbon disulfide	21.1	21.00		ppb v/v		99	71 - 131
Carbon tetrachloride	21.1	23.91		ppb v/v		113	63 - 126
Chlorobenzene	21.2	18.93		ppb v/v		89	63 - 123
Dibromochloromethane	21.1	21.00		ppb v/v		100	66 - 126
Chloroethane	21.1	20.68		ppb v/v		98	73 - 133
Chloroform	21.2	21.91		ppb v/v		103	70 - 130
Chloromethane	21.1	19.34		ppb v/v		92	61 - 140
1,2-Dibromoethane (EDB)	21.1	20.74		ppb v/v		98	64 - 124
1,2-Dichlorobenzene	21.1	19.91		ppb v/v		94	62 - 126
1,3-Dichlorobenzene	20.9	20.38		ppb v/v		97	59 - 130
1,4-Dichlorobenzene	21.2	20.59		ppb v/v		97	58 - 132
Dichlorodifluoromethane	21.1	22.48		ppb v/v		107	69 - 129
1,1-Dichloroethane	21.2	21.60		ppb v/v		102	71 - 131
1,2-Dichloroethane	21.3	21.74		ppb v/v		102	71 - 131
1,1-Dichloroethene	21.3	21.71		ppb v/v		102	72 - 132
cis-1,2-Dichloroethene	21.2	22.56		ppb v/v		107	70 - 130
trans-1,2-Dichloroethene	21.1	21.91		ppb v/v		104	72 - 132
1,2-Dichloropropane	21.1	21.92		ppb v/v		104	72 - 132
cis-1,3-Dichloropropene	22.0	21.21		ppb v/v		96	72 - 132
trans-1,3-Dichloropropene	20.6	20.58		ppb v/v		100	66 - 126
1,2-Dichloro-1,1,2,2-tetrafluoroethane	21.1	22.88		ppb v/v		109	74 - 134
Ethylbenzene	21.1	19.65		ppb v/v		93	64 - 124
4-Ethyltoluene	21.0	22.73		ppb v/v		108	66 - 129
Hexachlorobutadiene	21.0	17.05		ppb v/v		81	58 - 131
2-Hexanone	21.1	20.37		ppb v/v		97	69 - 129
Methylene Chloride	21.1	20.33		ppb v/v		96	67 - 127

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-267620/3
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Methyl-2-pentanone (MIBK)	21.1	20.04		ppb v/v		95	74 - 134
Styrene	21.2	20.09		ppb v/v		95	67 - 127
1,1,2,2-Tetrachloroethane	21.2	20.22		ppb v/v		95	64 - 124
Tetrachloroethene	21.2	22.58		ppb v/v		106	63 - 123
Toluene	21.2	21.58		ppb v/v		102	68 - 128
1,2,4-Trichlorobenzene	21.0	15.85		ppb v/v		76	58 - 138
1,1,1-Trichloroethane	21.2	22.77		ppb v/v		108	69 - 129
1,1,2-Trichloroethane	21.3	20.34		ppb v/v		96	64 - 124
Trichloroethene	21.2	22.98		ppb v/v		108	70 - 130
Trichlorofluoromethane	21.1	22.64		ppb v/v		107	71 - 131
1,1,2-Trichloro-1,2,2-trifluoroethane	21.2	22.65		ppb v/v		107	70 - 130
1,2,4-Trimethylbenzene	21.1	20.63		ppb v/v		98	60 - 132
1,3,5-Trimethylbenzene	21.1	21.41		ppb v/v		102	65 - 125
Vinyl acetate	22.0	20.98		ppb v/v		95	65 - 134
Vinyl chloride	21.1	21.28		ppb v/v		101	59 - 152
Hexane	21.1	21.28		ppb v/v		101	70 - 130
m,p-Xylene	42.2	39.43		ppb v/v		93	65 - 125
o-Xylene	21.1	19.80		ppb v/v		94	65 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*
Toluene-d8 (Surr)	*102*		*70 - 130*

Lab Sample ID: LCSD 320-267620/4
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	21.2	20.09		ppb v/v		95	65 - 125	0	25
Benzene	21.3	22.38		ppb v/v		105	68 - 128	2	25
Benzyl chloride	21.0	16.46		ppb v/v		79	67 - 127	3	25
Bromodichloromethane	21.1	22.02		ppb v/v		104	71 - 131	1	25
Bromoform	21.1	22.27		ppb v/v		106	66 - 126	7	25
Bromomethane	21.1	22.67		ppb v/v		107	73 - 134	2	25
2-Butanone (MEK)	21.2	22.34		ppb v/v		105	73 - 133	4	25
Carbon disulfide	21.1	20.91		ppb v/v		99	71 - 131	0	25
Carbon tetrachloride	21.1	23.87		ppb v/v		113	63 - 126	0	25
Chlorobenzene	21.2	20.33		ppb v/v		96	63 - 123	7	25
Dibromochloromethane	21.1	22.07		ppb v/v		105	66 - 126	5	25
Chloroethane	21.1	20.86		ppb v/v		99	73 - 133	1	25
Chloroform	21.2	21.84		ppb v/v		103	70 - 130	0	25
Chloromethane	21.1	19.90		ppb v/v		94	61 - 140	3	25
1,2-Dibromoethane (EDB)	21.1	21.89		ppb v/v		104	64 - 124	5	25
1,2-Dichlorobenzene	21.1	20.24		ppb v/v		96	62 - 126	2	25
1,3-Dichlorobenzene	20.9	21.37		ppb v/v		102	59 - 130	5	25
1,4-Dichlorobenzene	21.2	21.80		ppb v/v		103	58 - 132	6	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-267620/4
Matrix: Air
Analysis Batch: 267620

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane			21.1	21.76		ppb v/v		103	69 - 129	3	25
1,1-Dichloroethane			21.2	21.56		ppb v/v		101	71 - 131	0	25
1,2-Dichloroethane			21.3	21.69		ppb v/v		102	71 - 131	0	25
1,1-Dichloroethene			21.3	21.36		ppb v/v		100	72 - 132	2	25
cis-1,2-Dichloroethene			21.2	22.85		ppb v/v		108	70 - 130	1	25
trans-1,2-Dichloroethene			21.1	21.63		ppb v/v		102	72 - 132	1	25
1,2-Dichloropropane			21.1	22.32		ppb v/v		106	72 - 132	2	25
cis-1,3-Dichloropropene			22.0	21.65		ppb v/v		98	72 - 132	2	25
trans-1,3-Dichloropropene			20.6	21.55		ppb v/v		105	66 - 126	5	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			21.1	22.57		ppb v/v		107	74 - 134	1	25
Ethylbenzene			21.1	21.08		ppb v/v		100	64 - 124	7	25
4-Ethyltoluene			21.0	22.02		ppb v/v		105	66 - 129	3	25
Hexachlorobutadiene			21.0	17.12		ppb v/v		82	58 - 131	0	25
2-Hexanone			21.1	21.18		ppb v/v		101	69 - 129	4	25
Methylene Chloride			21.1	20.29		ppb v/v		96	67 - 127	0	25
4-Methyl-2-pentanone (MIBK)			21.1	20.47		ppb v/v		97	74 - 134	2	25
Styrene			21.2	21.42		ppb v/v		101	67 - 127	6	25
1,1,2,2-Tetrachloroethane			21.2	21.09		ppb v/v		99	64 - 124	4	25
Tetrachloroethene			21.2	23.20		ppb v/v		109	63 - 123	3	25
Toluene			21.2	22.17		ppb v/v		105	68 - 128	3	25
1,2,4-Trichlorobenzene			21.0	16.02		ppb v/v		76	58 - 138	1	25
1,1,1-Trichloroethane			21.2	22.41		ppb v/v		106	69 - 129	2	25
1,1,2-Trichloroethane			21.3	21.50		ppb v/v		101	64 - 124	6	25
Trichloroethene			21.2	23.28		ppb v/v		110	70 - 130	1	25
Trichlorofluoromethane			21.1	21.95		ppb v/v		104	71 - 131	3	25
1,1,2-Trichloro-1,2,2-trifluoroethane			21.2	22.46		ppb v/v		106	70 - 130	1	25
1,2,4-Trimethylbenzene			21.1	21.01		ppb v/v		99	60 - 132	2	25
1,3,5-Trimethylbenzene			21.1	21.57		ppb v/v		102	65 - 125	1	25
Vinyl acetate			22.0	21.07		ppb v/v		96	65 - 134	0	25
Vinyl chloride			21.1	20.85		ppb v/v		99	59 - 152	2	25
Hexane			21.1	20.99		ppb v/v		99	70 - 130	1	25
m,p-Xylene			42.2	42.45		ppb v/v		101	65 - 125	7	25
o-Xylene			21.1	21.19		ppb v/v		100	65 - 125	7	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

QC Association Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Air - GC/MS VOA

Analysis Batch: 267620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-46208-1	20181211-M-SVE	Total/NA	Air	TO-15	
MB 320-267620/6	Method Blank	Total/NA	Air	TO-15	
LCS 320-267620/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-267620/4	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Client Sample ID: 20181211-M-SVE
Date Collected: 12/11/18 14:50
Date Received: 12/17/18 09:20

Lab Sample ID: 320-46208-1
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		35.5	10.6 mL	250 mL	267620	12/28/18 02:58	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

Method Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 320-46208-1
SDG: Property ID 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-46208-1	20181211-M-SVE	Air	12/11/18 14:50	12/17/18 09:20

CHAIN OF CUSTODY RECORD

No. 1028

EQUUS

PROJECT NUMBER: CHKSTATM: H18001	PROJECT NAME: CHK STATE M	COC 1 of 1
SHIPPED TO: TA - 32C	PROJECT MANAGER: DAVID BRADY	TAT: STANDARD

SAMPLER'S PRINTED NAME: Terry Fisher

SAMPLER'S SIGNATURE: Terry Fisher

ASOW: N/A.

TAL # 320-44921

CAN # 34000438

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	TO-15	TOTAL VOCs & HEXANE	REMARKS
12-11-18	1450	20181211-M-SVE	AIR	1	X	X	

320-46208 Chain of Custody

TOTAL NUMBER OF CONTAINERS: 1

RELINQUISHED BY: Terry Fisher	DATE 12-12-18 TIME 1600	RECEIVED BY: Emily Jones TA-SAC	DATE 12/13/18 TIME 9:20
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FEDEX

AIRBILL NUMBER: 7739 6378 2610

RECEIVED IN LABORATORY BY: DATE TIME

Send PDF, EDD, and INVOICE (if applicable) to: JULIE.CZACHP@EQUUSENV.COM

LABORATORY CONTACT: 615-301-5041 (CathyQ@TA-Nashville)

LABORATORY ADDRESS: 880 RIVERSIDE PARKWAY W. SACRAMENTO, CA 95605

POINT OF ORIGIN

Login Sample Receipt Checklist

Client: Chesapeake Energy Corporation

Job Number: 320-46208-1
SDG Number: Property ID 891077

Login Number: 46208
List Number: 1
Creator: James, Emily M

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: B 11-05-18

Date of QC: 11/6/18

320-44921 Chain of Custody

Data File Number: C:\MSDOCUM\1\DATA\18110b\

(File ID for certification analysis of canister designated below)

CANISTER ID NUMBERS

*	34000438 MS7110625.d
	34001193
	8408
	7827
	7900
	34001209
	8124
	8133
	34000458
	34001460
	34000268
	34000571

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED

1st Level Reviewed By — Date: 11/7/18

2nd Level Reviewed By — Date: 11/15/18

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44921-1

SDG No.:

Client Sample ID: 34000438 Lab Sample ID: 320-44921-1

Matrix: Air Lab File ID: MS7110625.D

Analysis Method: TO-15 Date Collected: 11/05/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/07/2018 07:25

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 257298 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	ND		5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	ND		0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44921-1

SDG No.:

Client Sample ID: 34000438 Lab Sample ID: 320-44921-1

Matrix: Air Lab File ID: MS7110625.D

Analysis Method: TO-15 Date Collected: 11/05/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/07/2018 07:25

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 257298 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	0.068	J	0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	ND		0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	ND		0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	0.12	J	0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	0.051	J	0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44921-1

SDG No.:

Client Sample ID: 34000438 Lab Sample ID: 320-44921-1

Matrix: Air Lab File ID: MS7110625.D

Analysis Method: TO-15 Date Collected: 11/05/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/07/2018 07:25

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 257298 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	0.25	J B	0.80	0.10
95-47-6	o-Xylene	0.074	J B	0.40	0.054
1330-20-7	Xylenes, Total	0.32	J B	1.2	0.074
87-61-6	1,2,3-Trichlorobenzene	ND		2.0	0.62
60-29-7	Ethyl ether	ND		0.80	0.20
71-36-3	n-Butanol	ND		2.0	0.26
111-84-2	n-Nonane	ND		0.80	0.058

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	92		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-130
2037-26-5	Toluene-d8 (Surr)	98		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Lims ID:	320-44921-A-1				
Client ID:	34000438				
Sample Type:	Client				
Inject. Date:	07-Nov-2018 07:25:30	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Sample Info:	320-44921-A-1				
Misc. Info.:	500 mL CAN CERT				
Operator ID:	SV	Instrument ID:	ATMS7		
Method:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\TO15_ATMS7N.m				
Limit Group:	MSA - TO15 - ICAL				
Last Update:	07-Nov-2018 11:00:15	Calib Date:	06-Sep-2018 03:08:30		
Integrator:	RTE	ID Type:	Deconvolution ID		
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\ATMS7\20180905-63755.b\MS7090512.D				
Column 1 :	RTX Volatiles (0.32 mm)		Det: MS SCAN		
Process Host:	XAWRK007				
First Level Reviewer: leeh		Date:	07-Nov-2018 10:58:45		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	12.179	12.197	-0.018	81	34607	4.00	
* 2 1,4-Difluorobenzene	114	14.332	14.351	-0.018	94	162156	4.00	
* 3 Chlorobenzene-d5 (IS)	117	21.006	21.024	-0.018	87	148483	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	13.383	13.385	-0.018	97	57759	3.97	
$ 5 Toluene-d8 (Surr)	100	17.727	17.729	-0.024	99	115506	3.94	
$ 6 4-Bromofluorobenzene (Surr	95	23.555	23.559	-0.024	0	96613	3.68	
11 Propene	41	3.826	3.845	-0.024	16	534	0.0761	
13 Dichlorodifluoromethane	85	3.899	3.911	-0.018	92	1235	0.0592	
58 Isooctane	57	13.323	13.354	-0.048	83	2102	0.0411	
64 n-Heptane	43	13.876	13.883	-0.024	1	877	0.0386	
73 n-Octane	43	17.764	17.777	-0.036	42	1018	0.0312	
75 Toluene	91	17.910	17.911	-0.024	83	2529	0.0511	
80 Tetrachloroethene	166	19.418	19.426	-0.024	93	2430	0.1152	
86 Ethylbenzene	91	21.268	21.274	-0.024	93	4402	0.0676	
87 m-Xylene & p-Xylene	91	21.450	21.456	-0.024	98	13060	0.2518	
88 o-Xylene	91	22.351	22.356	-0.024	92	3933	0.0742	
104 1,3,5-Trimethylbenzene	120	24.316	24.319	-0.024	1	1117	0.0378	
S 150 Xylenes, Total	91				0		0.3260	

Reagents:

VAMSIS20_00240 Amount Added: 50.00 Units: mL Run Reagent

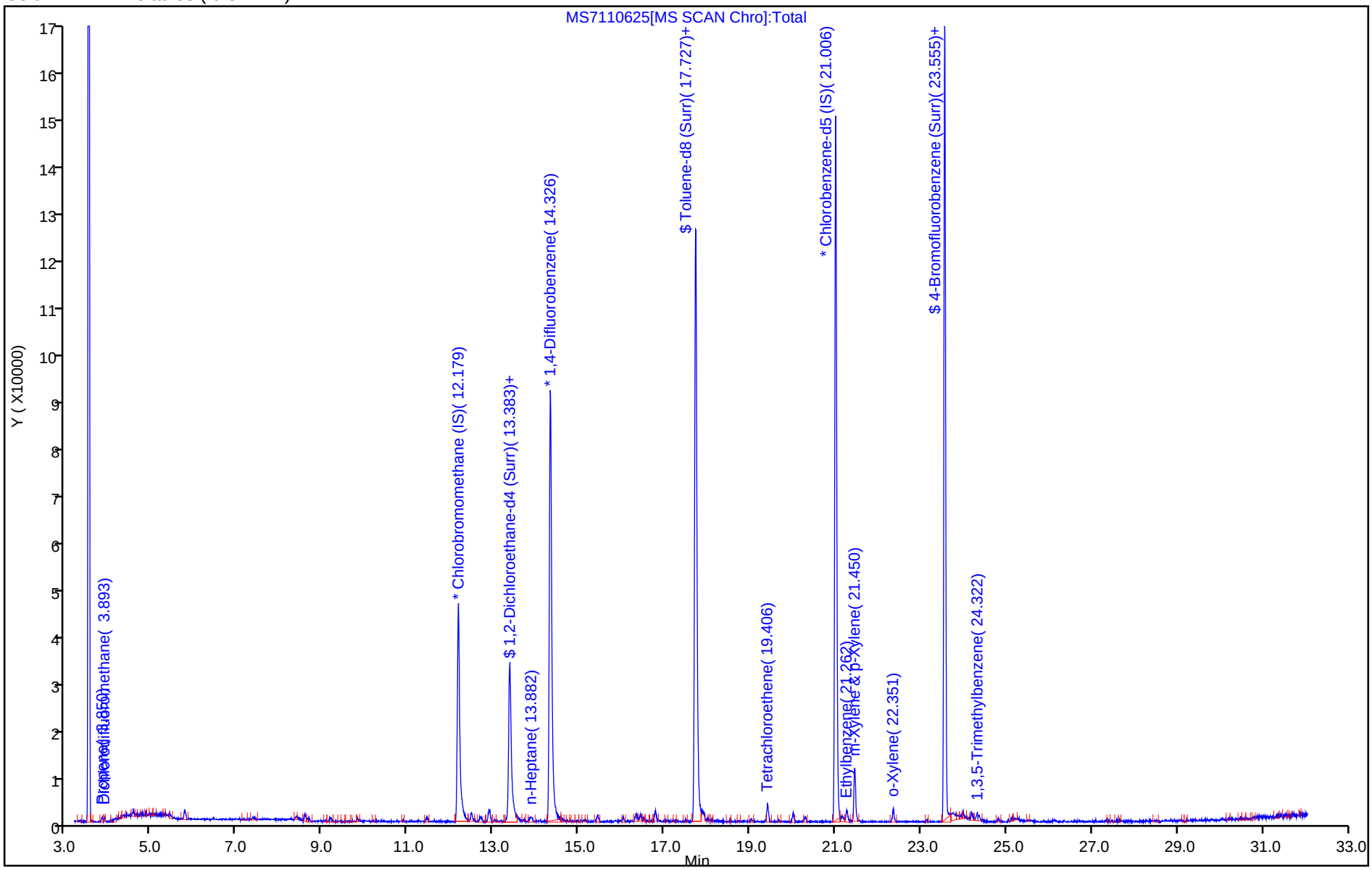
Report Date: 07-Nov-2018 11:01:01 Chrom Revision: 2.3 12-Oct-2018 08:24:38

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D

Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7	Operator ID:	SV
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1	Worklist Smp#:	25
Client ID:	34000438				
Purge Vol:	5.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



1/2/2019

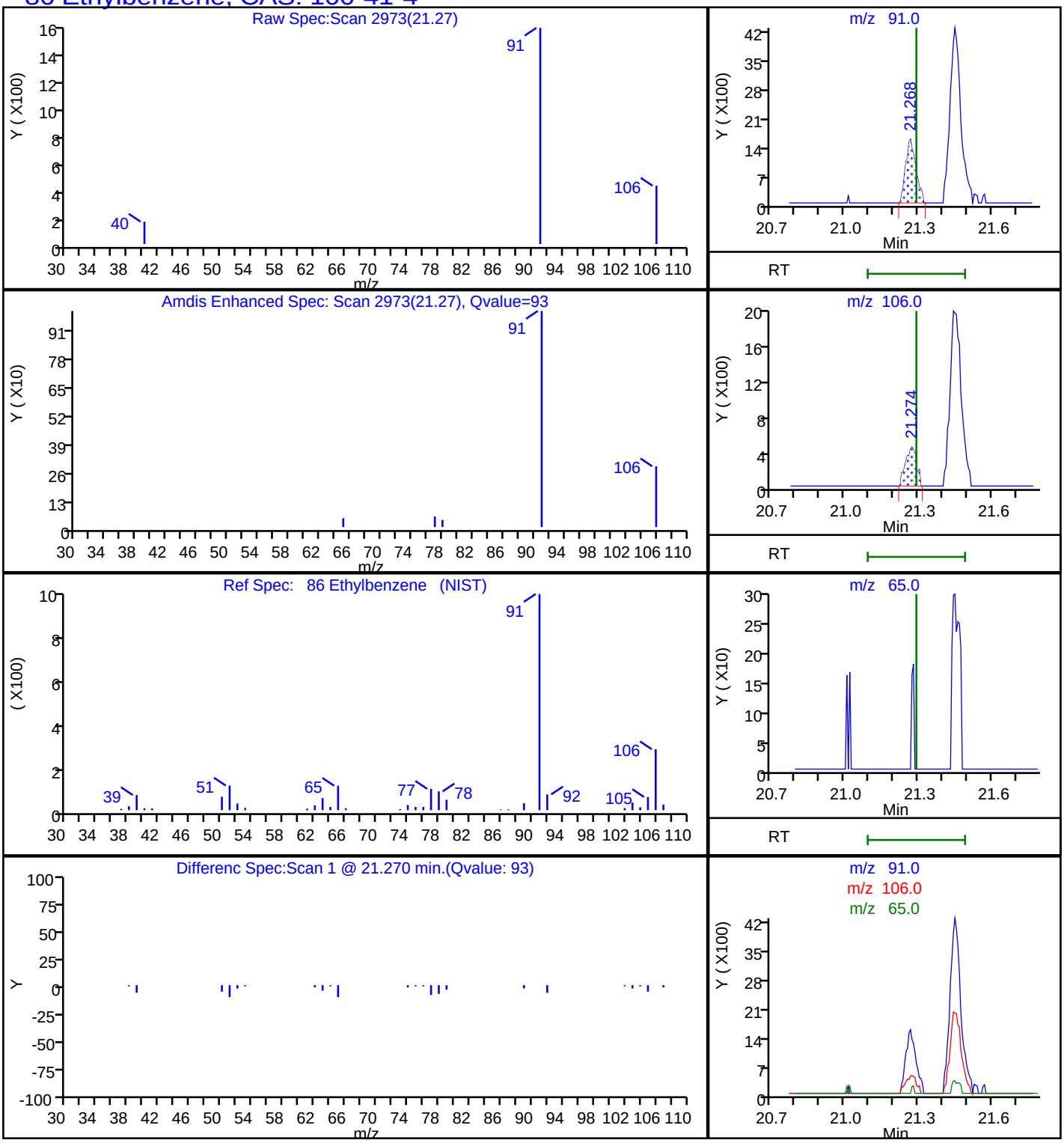
Report Date: 07-Nov-2018 11:01:02 Chrom Revision: 2.3 12-Oct-2018 08:24:38

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D

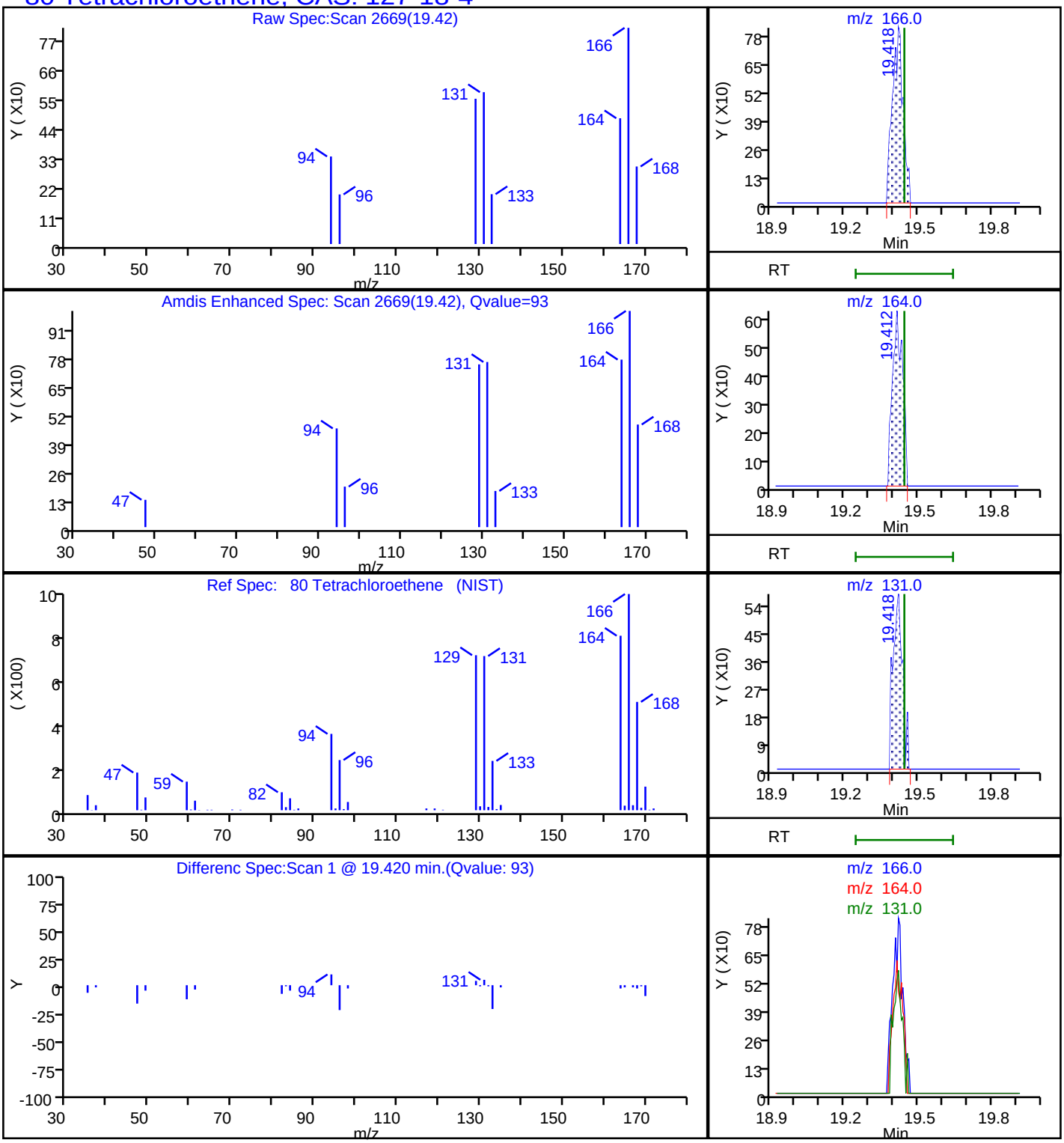
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

86 Ethylbenzene, CAS: 100-41-4



Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D
Injection Date: 07-Nov-2018 07:25:30 Instrument ID: ATMS7
Lims ID: 320-44921-A-1 Lab Sample ID: 320-44921-1
Client ID: 34000438
Operator ID: SV ALS Bottle#: 4 Worklist Smp#: 25
Purge Vol: 5.000 mL Dil. Factor: 1.0000
Method: TO15_ATMS7N Limit Group: MSA - TO15 - ICAL
Column: RTX Volatiles (0.32 mm) Detector MS SCAN

80 Tetrachloroethene, CAS: 127-18-4



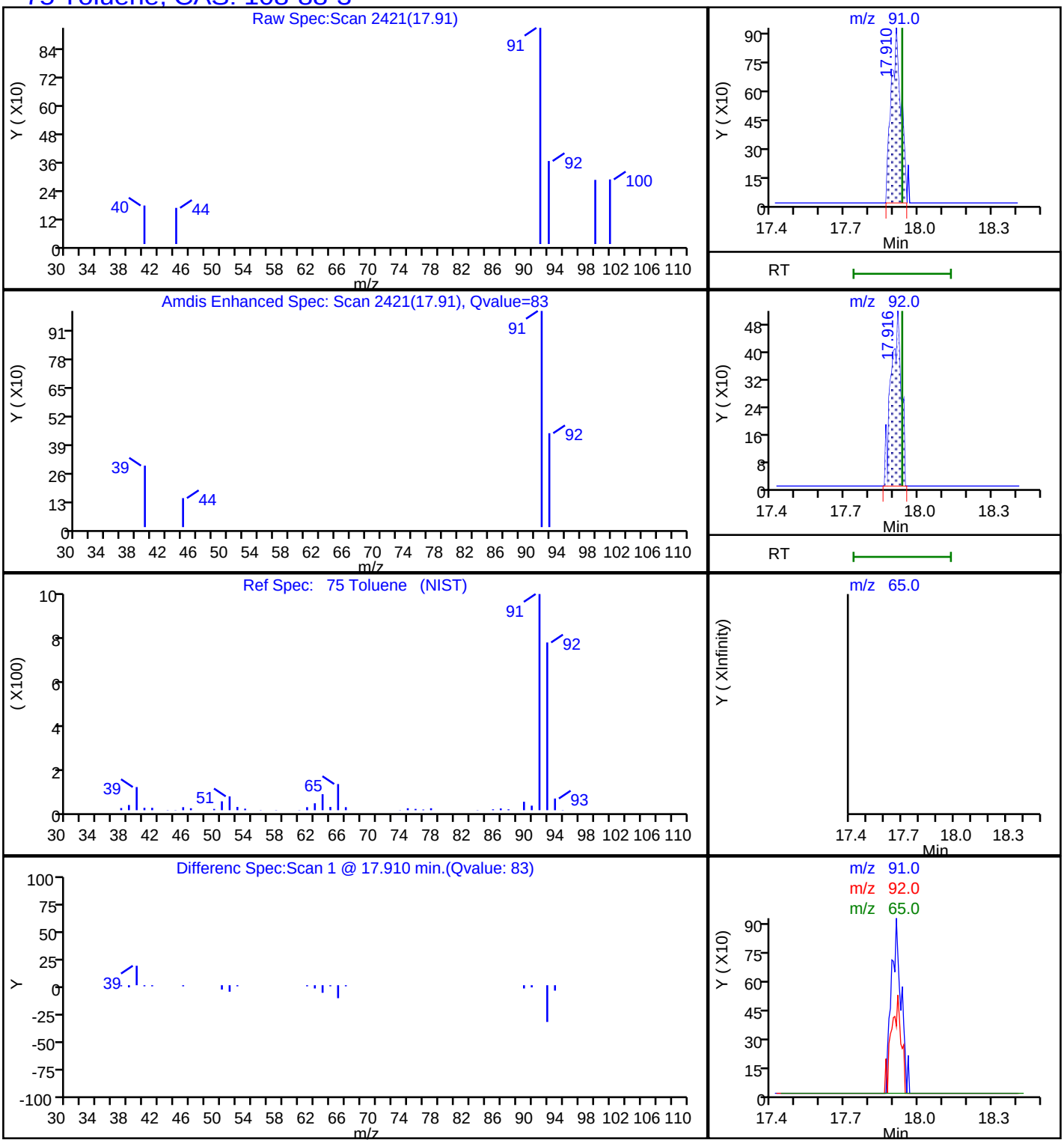
Report Date: 07-Nov-2018 11:01:02 Chrom Revision: 2.3 12-Oct-2018 08:24:38

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D

Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

75 Toluene, CAS: 108-88-3



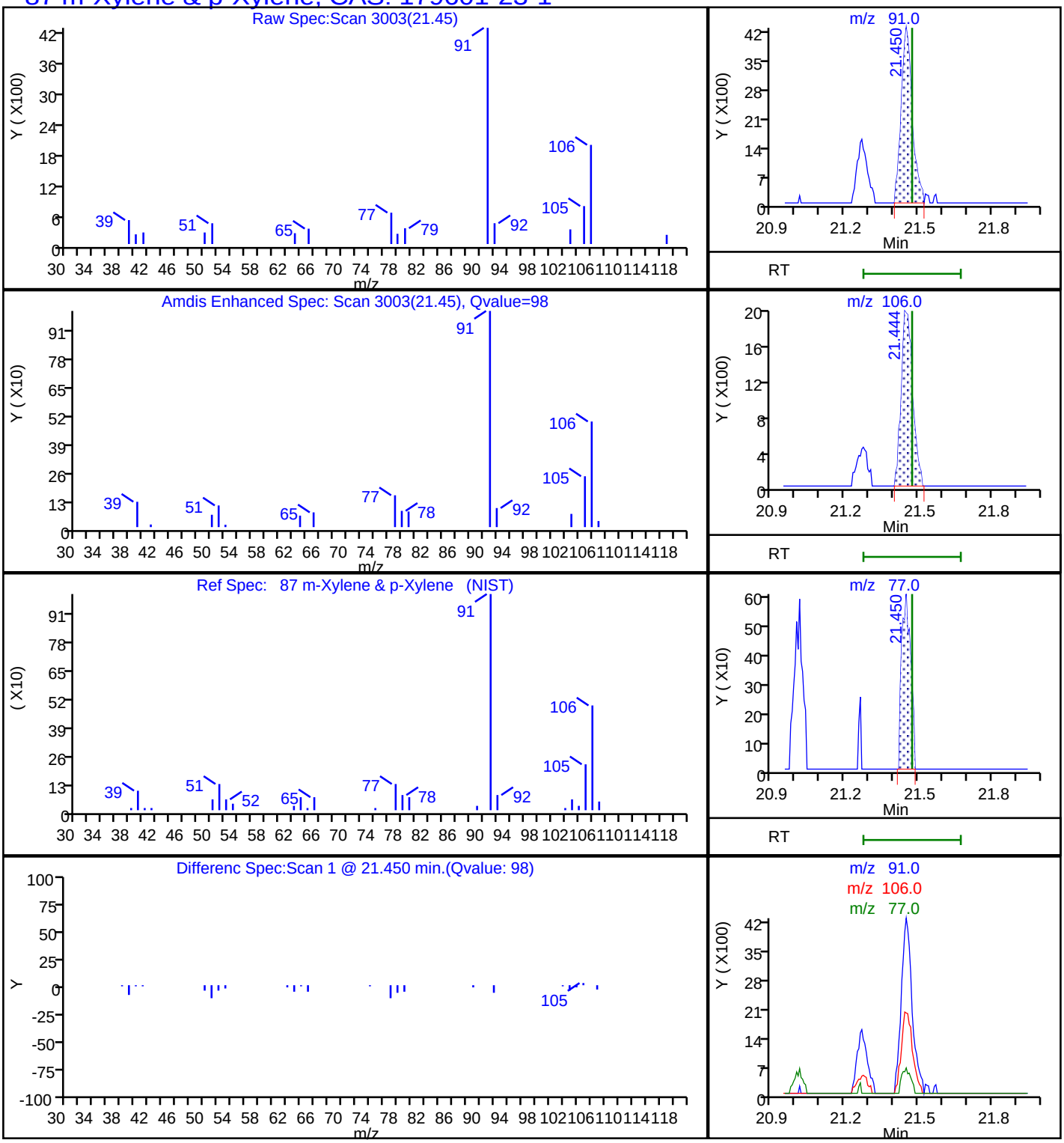
Report Date: 07-Nov-2018 11:01:02 Chrom Revision: 2.3 12-Oct-2018 08:24:38

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D

Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

87 m-Xylene & p-Xylene, CAS: 179601-23-1



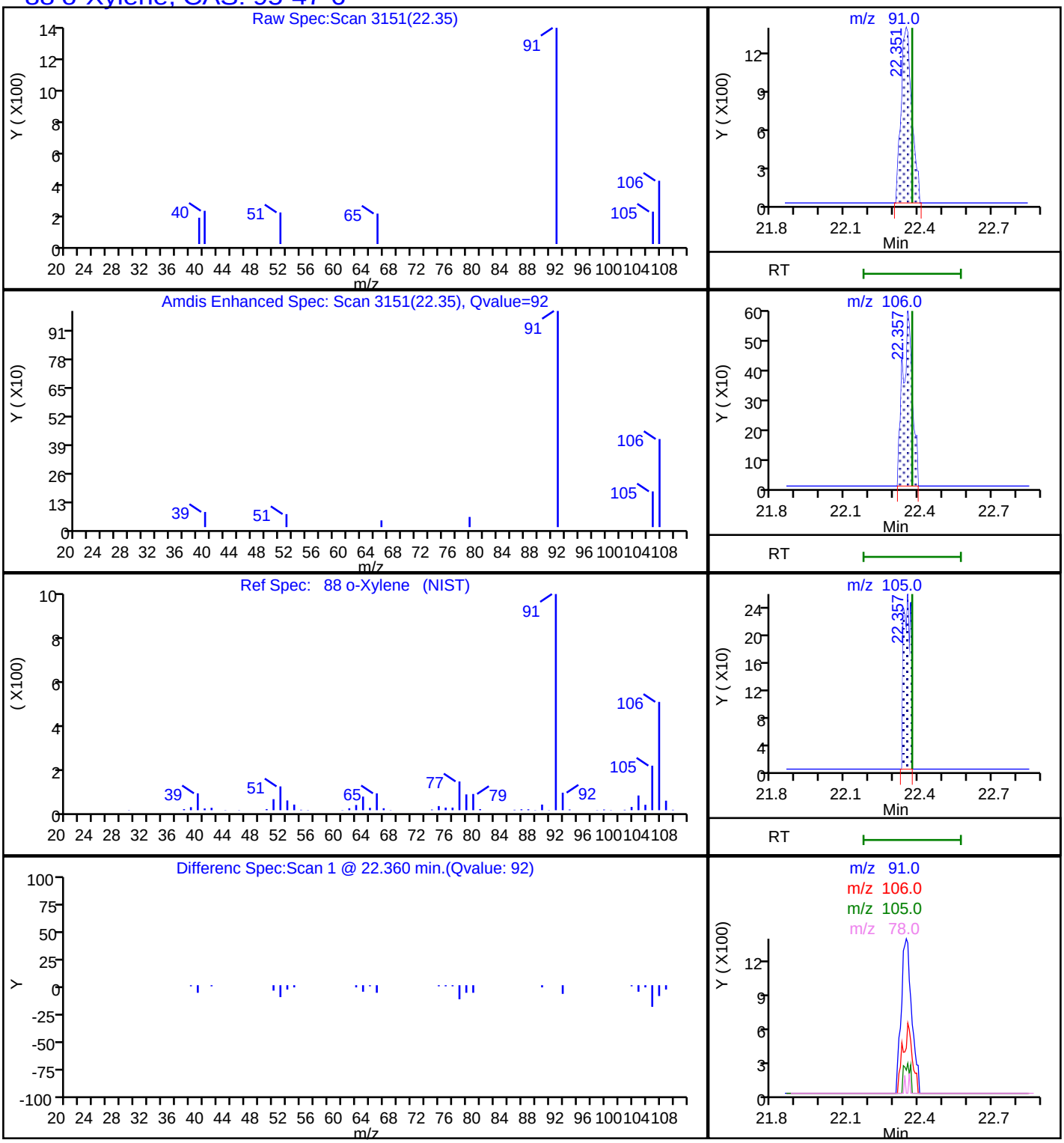
Report Date: 07-Nov-2018 11:01:02 Chrom Revision: 2.3 12-Oct-2018 08:24:38

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D

Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

88 o-Xylene, CAS: 95-47-6



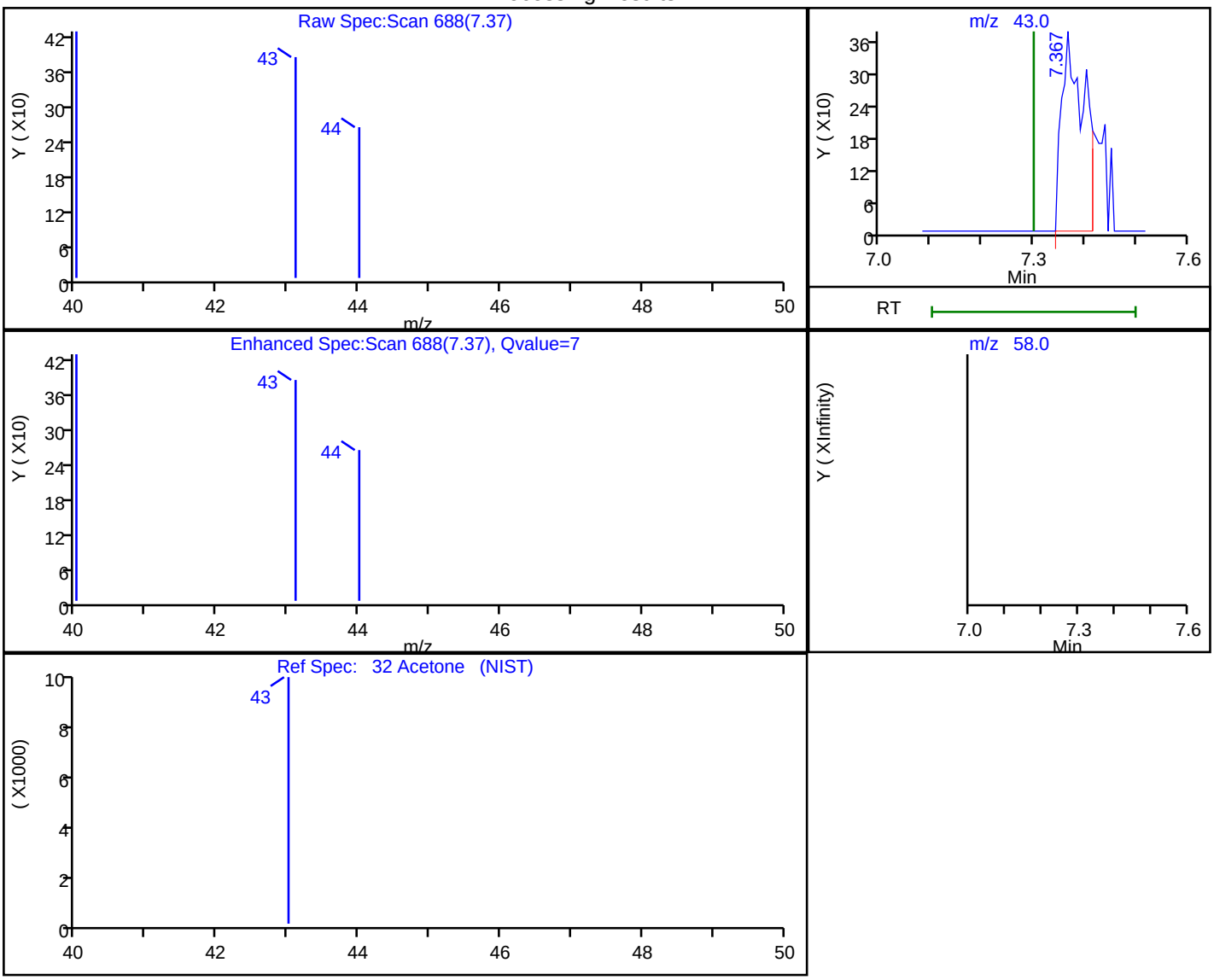
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1

Processing Results



RT	Mass	Response	Amount
7.37	43.00	1133	0.073272
7.30	58.00	0	

Reviewer: leeh, 07-Nov-2018 10:57:43

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

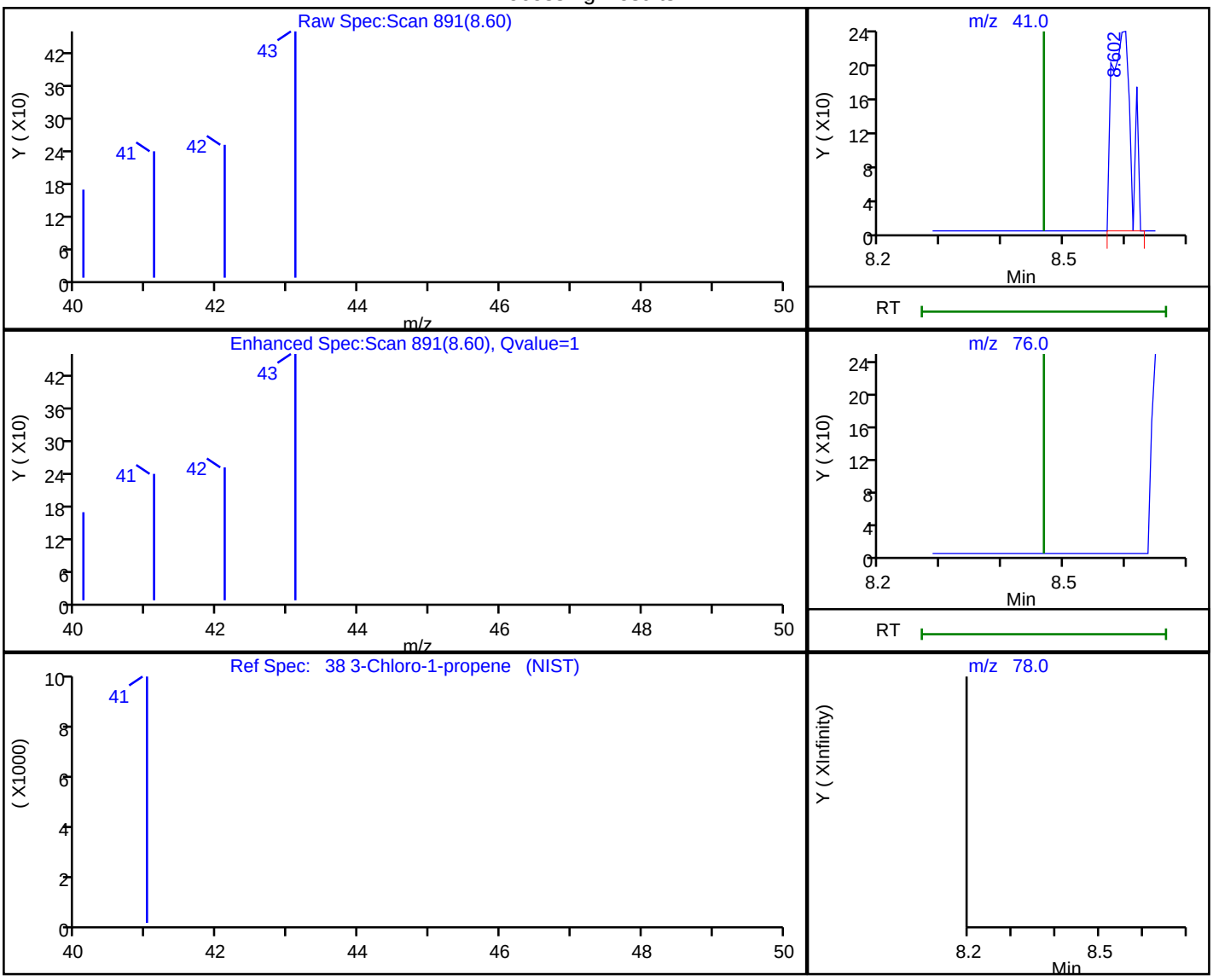
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

38 3-Chloro-1-propene, CAS: 107-05-1

Processing Results



RT	Mass	Response	Amount
8.60	41.00	502	0.036614
8.47	76.00	0	
8.47	78.00	0	

Reviewer: leeh, 07-Nov-2018 10:57:45

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

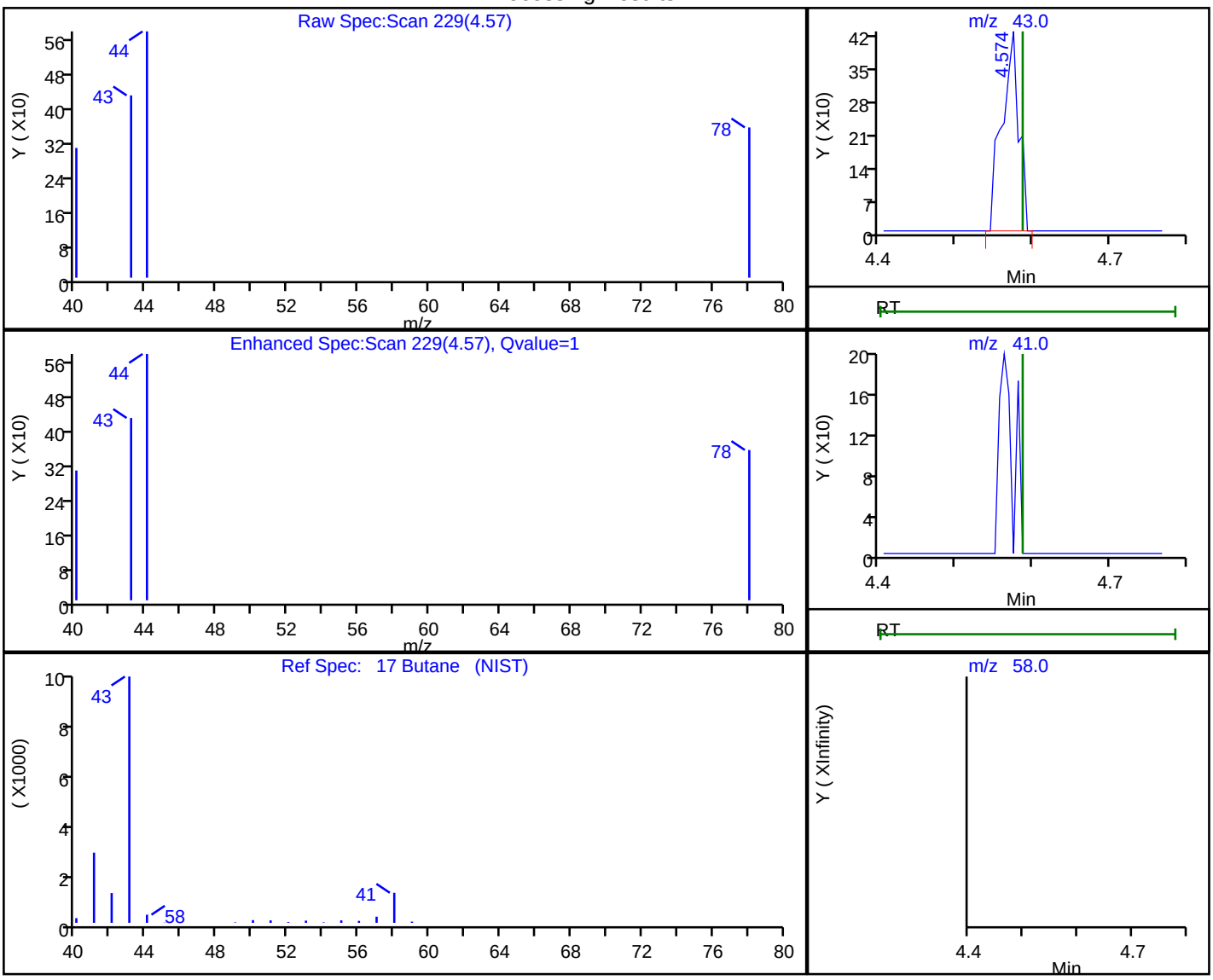
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

17 Butane, CAS: 106-97-8

Processing Results



RT	Mass	Response	Amount
4.57	43.00	658	0.062983
4.59	41.00	0	
4.59	58.00	0	

Reviewer: leeh, 07-Nov-2018 10:57:38

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

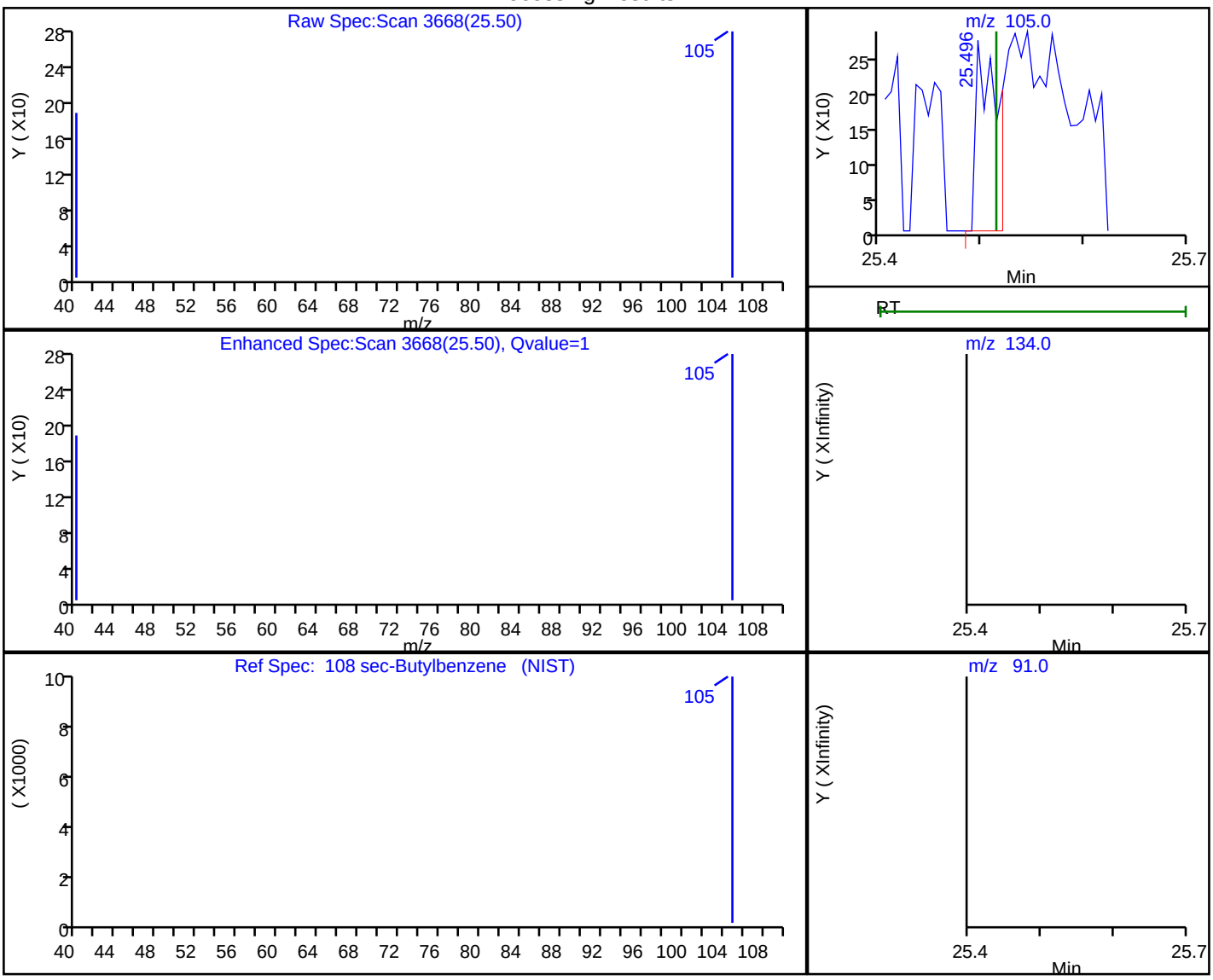
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

108 sec-Butylbenzene, CAS: 135-98-8

Processing Results



RT	Mass	Response	Amount
25.50	105.00	383	0.004420
25.51	134.00	0	
25.51	91.00	0	

Reviewer: leeh, 07-Nov-2018 10:58:31

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

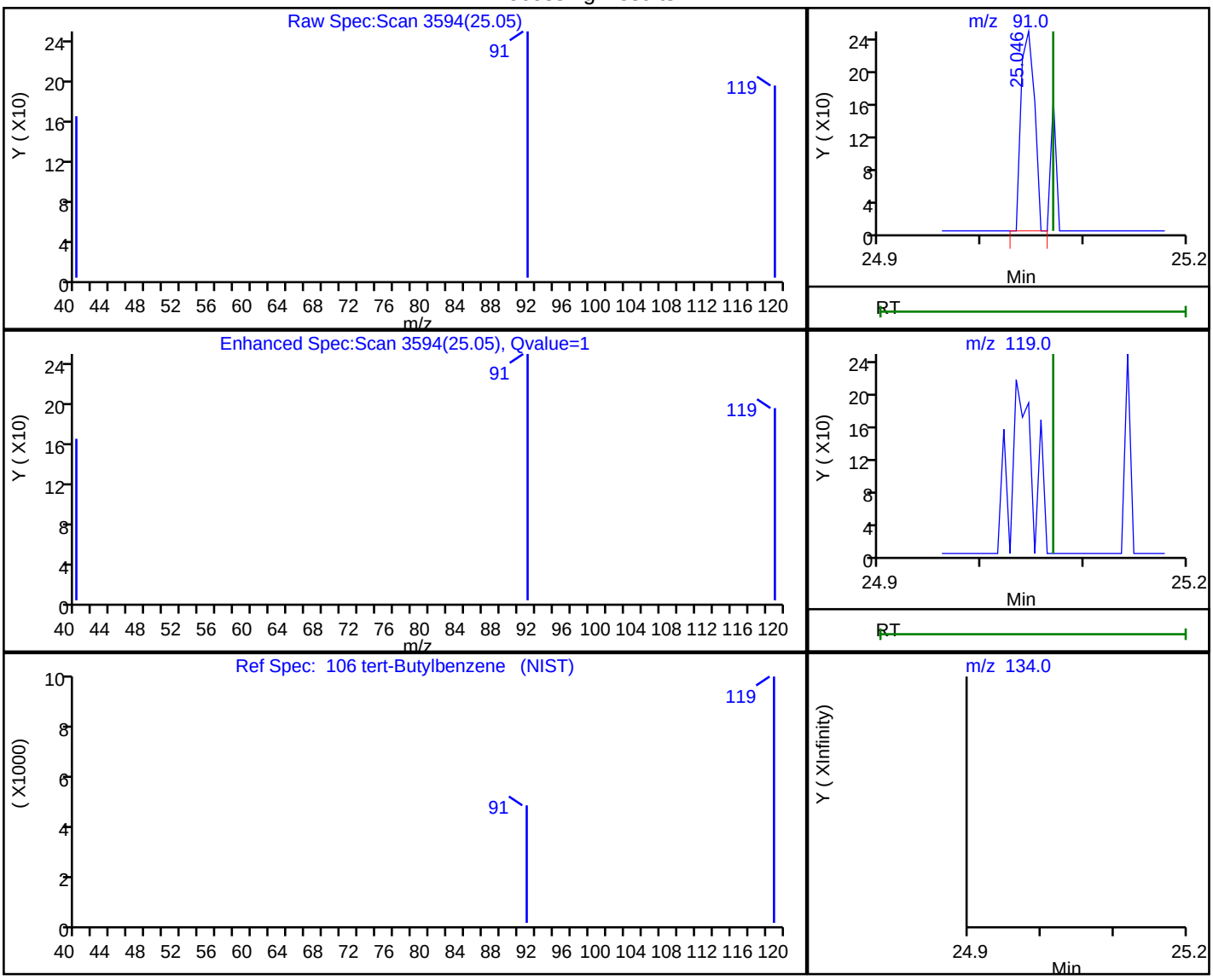
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

106 tert-Butylbenzene, CAS: 98-06-6

Processing Results



RT	Mass	Response	Amount
25.05	91.00	221	0.005574
25.07	119.00	0	
25.07	134.00	0	

Reviewer: leeh, 07-Nov-2018 10:58:26

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

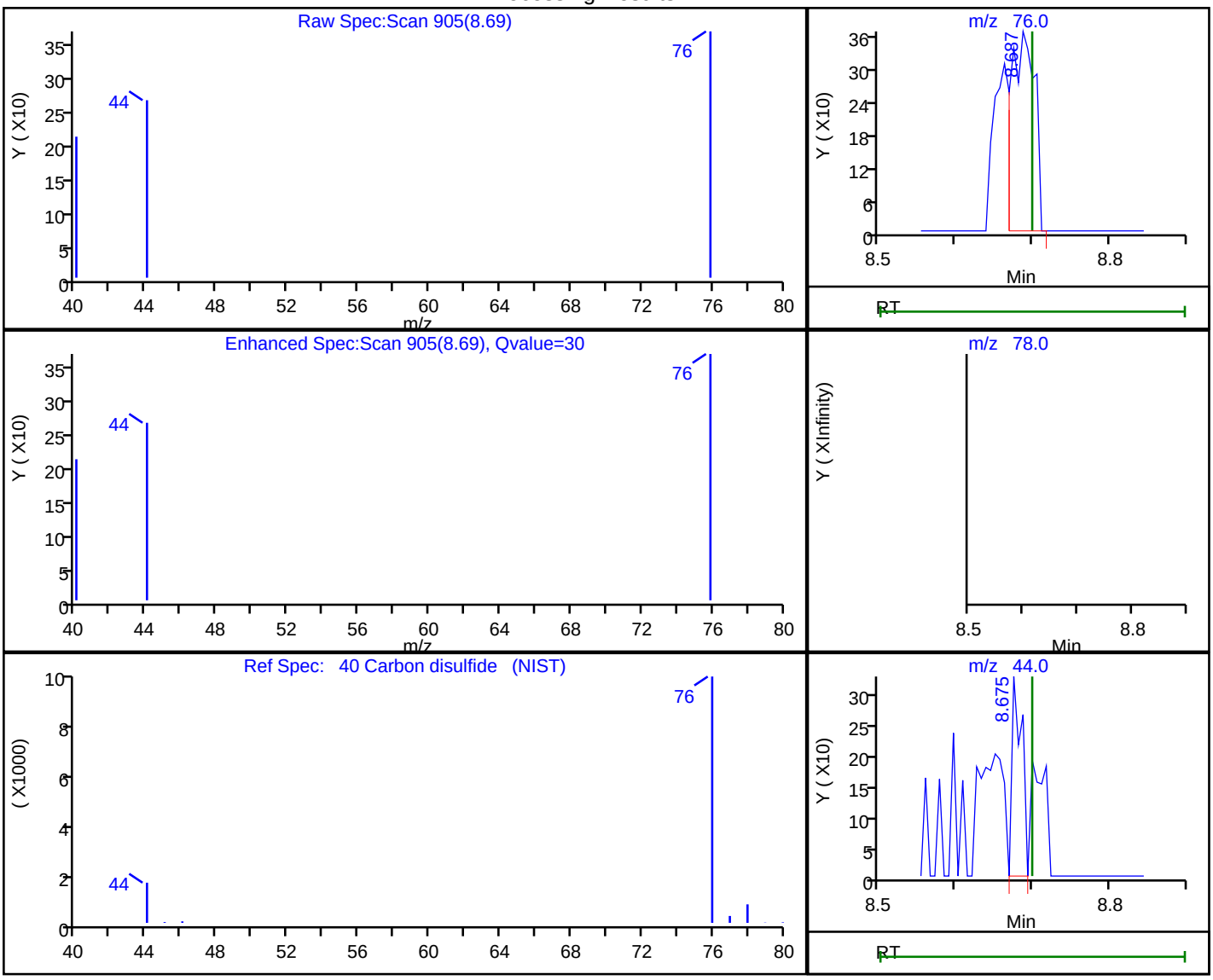
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

40 Carbon disulfide, CAS: 75-15-0

Processing Results



RT	Mass	Response	Amount
8.69	76.00	775	0.039638
8.70	78.00	0	
8.67	44.00	293	

Reviewer: leeh, 07-Nov-2018 10:57:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

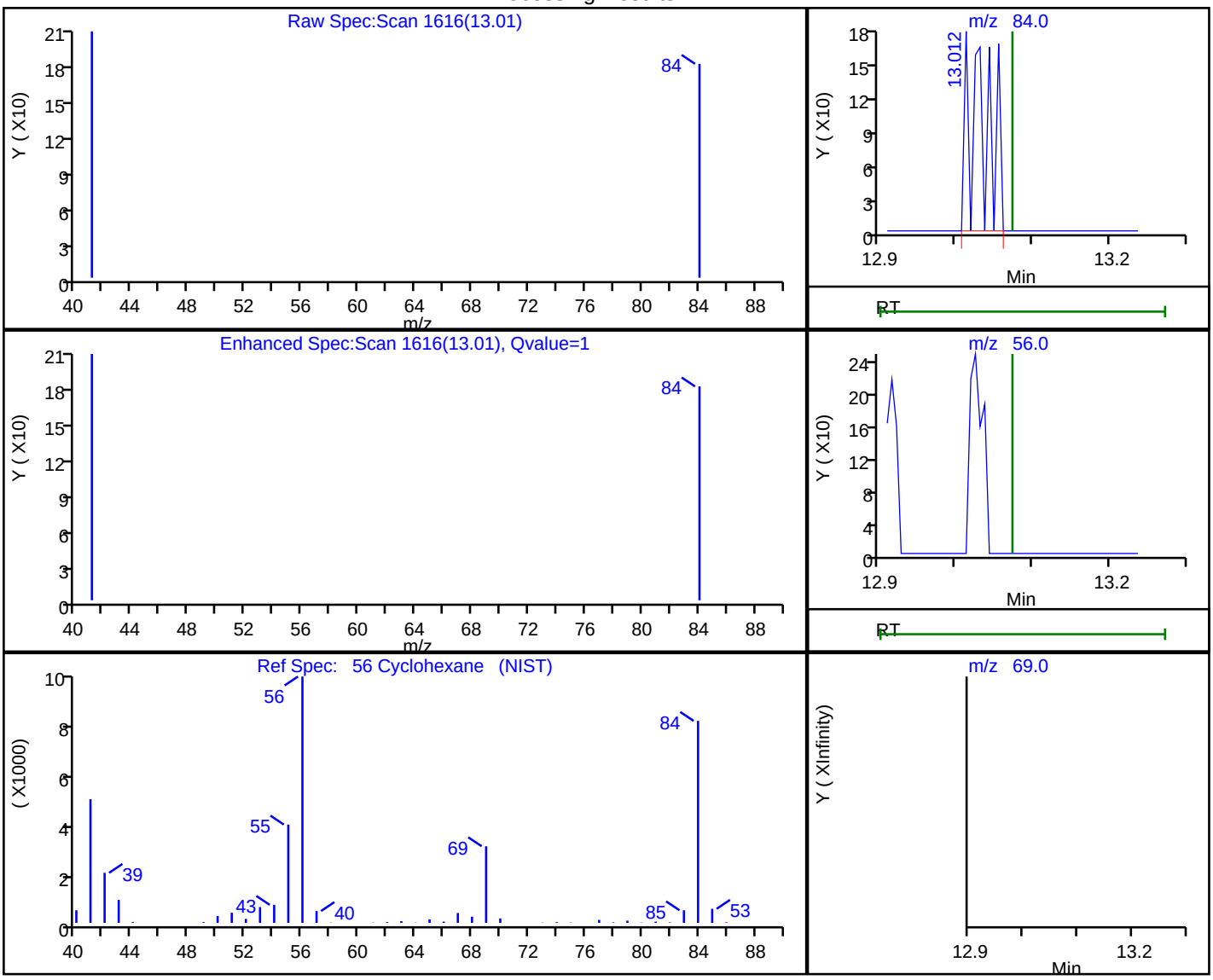
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

56 Cyclohexane, CAS: 110-82-7

Processing Results



RT	Mass	Response	Amount
13.01	84.00	303	0.023745
13.07	56.00	0	
13.07	69.00	0	

Reviewer: leeh, 07-Nov-2018 10:57:50

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

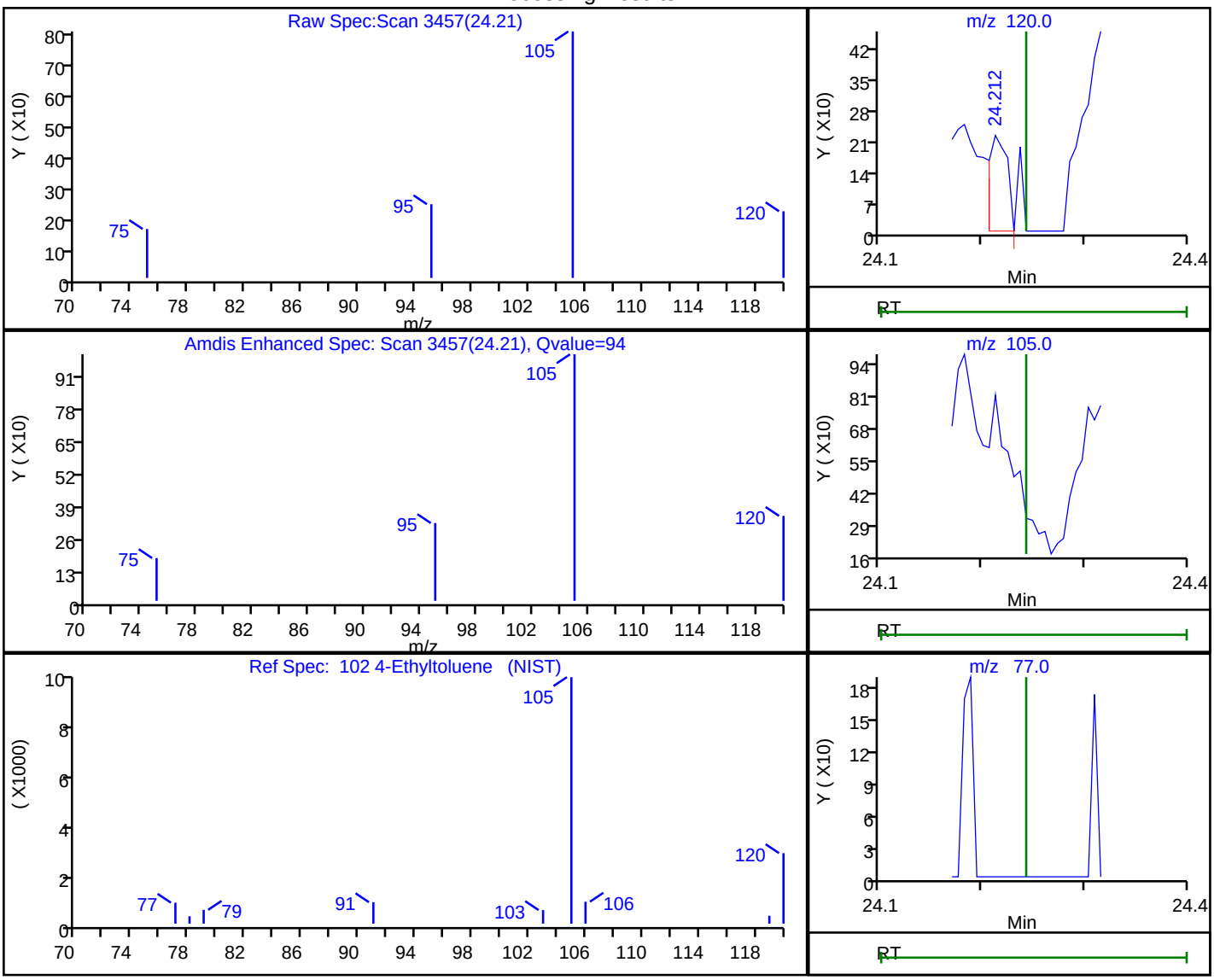
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

102 4-Ethyltoluene, CAS: 622-96-8

Processing Results



RT	Mass	Response	Amount
24.21	120.00	269	0.013378
24.24	105.00	0	
24.24	77.00	0	

Reviewer: leeh, 07-Nov-2018 10:58:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

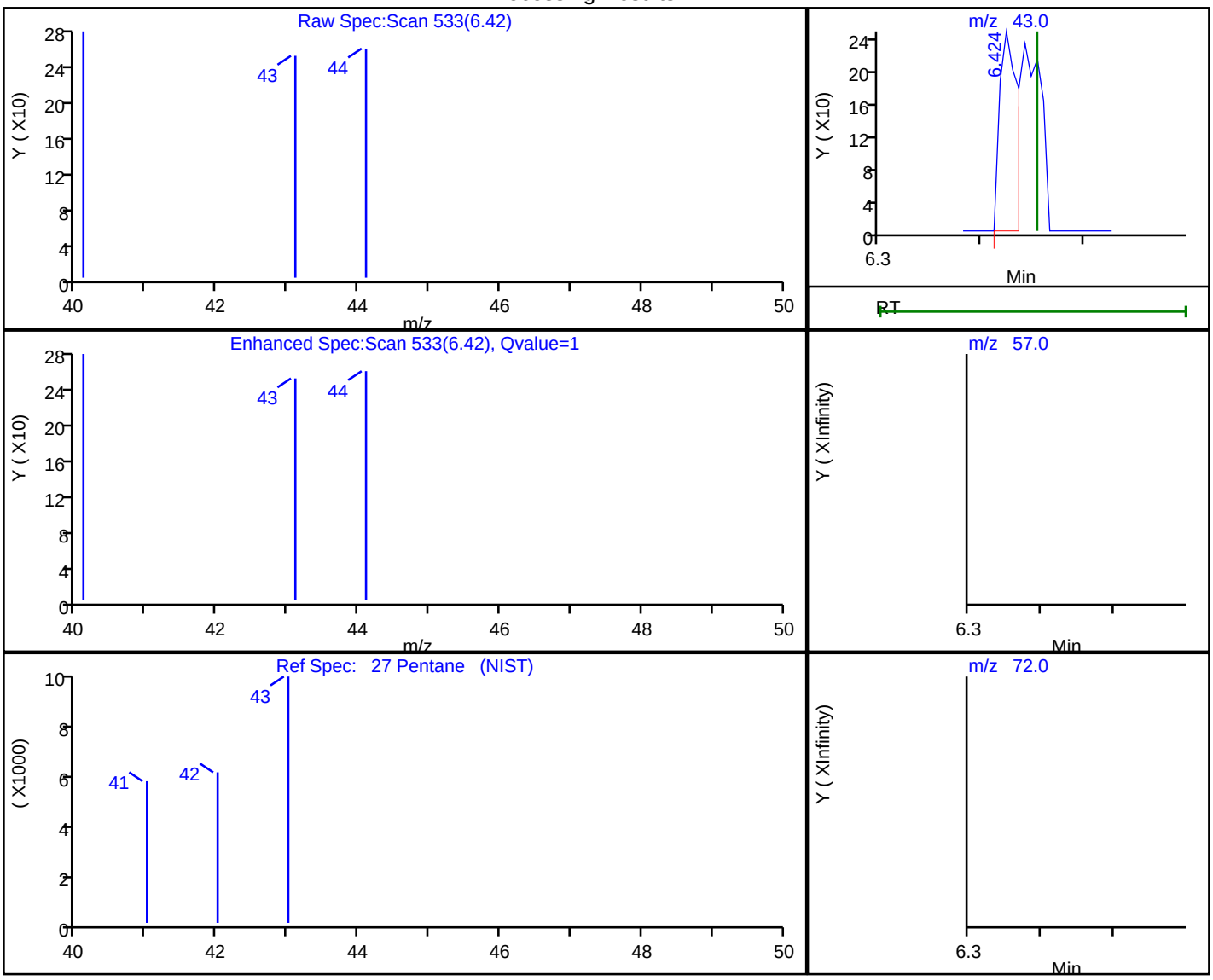
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

27 Pentane, CAS: 109-66-0

Processing Results



RT	Mass	Response	Amount
6.42	43.00	293	0.017537
6.45	57.00	0	
6.45	72.00	0	

Reviewer: leeh, 07-Nov-2018 10:57:41

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

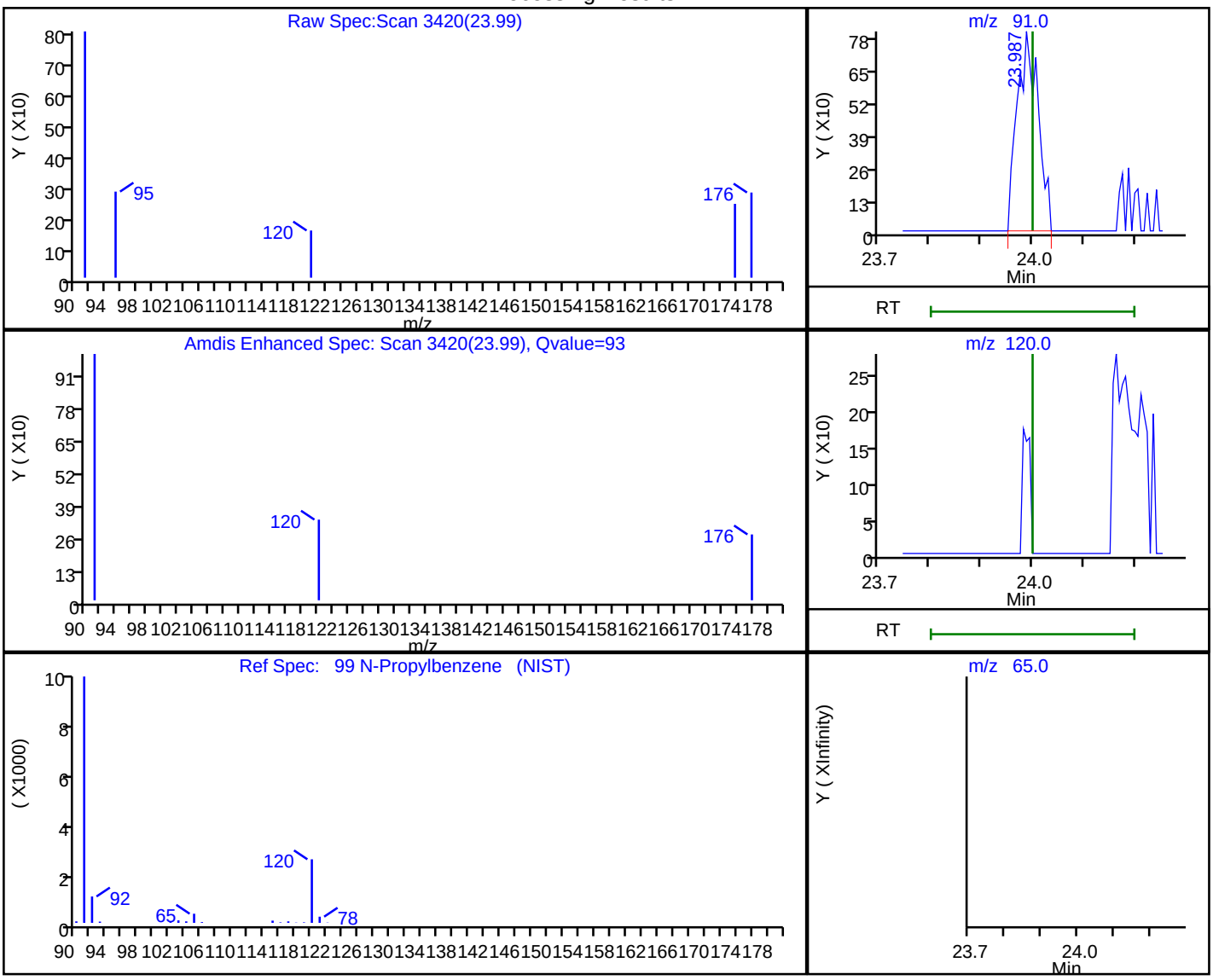
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

99 N-Propylbenzene, CAS: 103-65-1

Processing Results



RT	Mass	Response	Amount
23.99	91.00	2282	0.027234
24.00	120.00	0	
24.00	65.00	0	

Reviewer: leeh, 07-Nov-2018 10:58:18

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

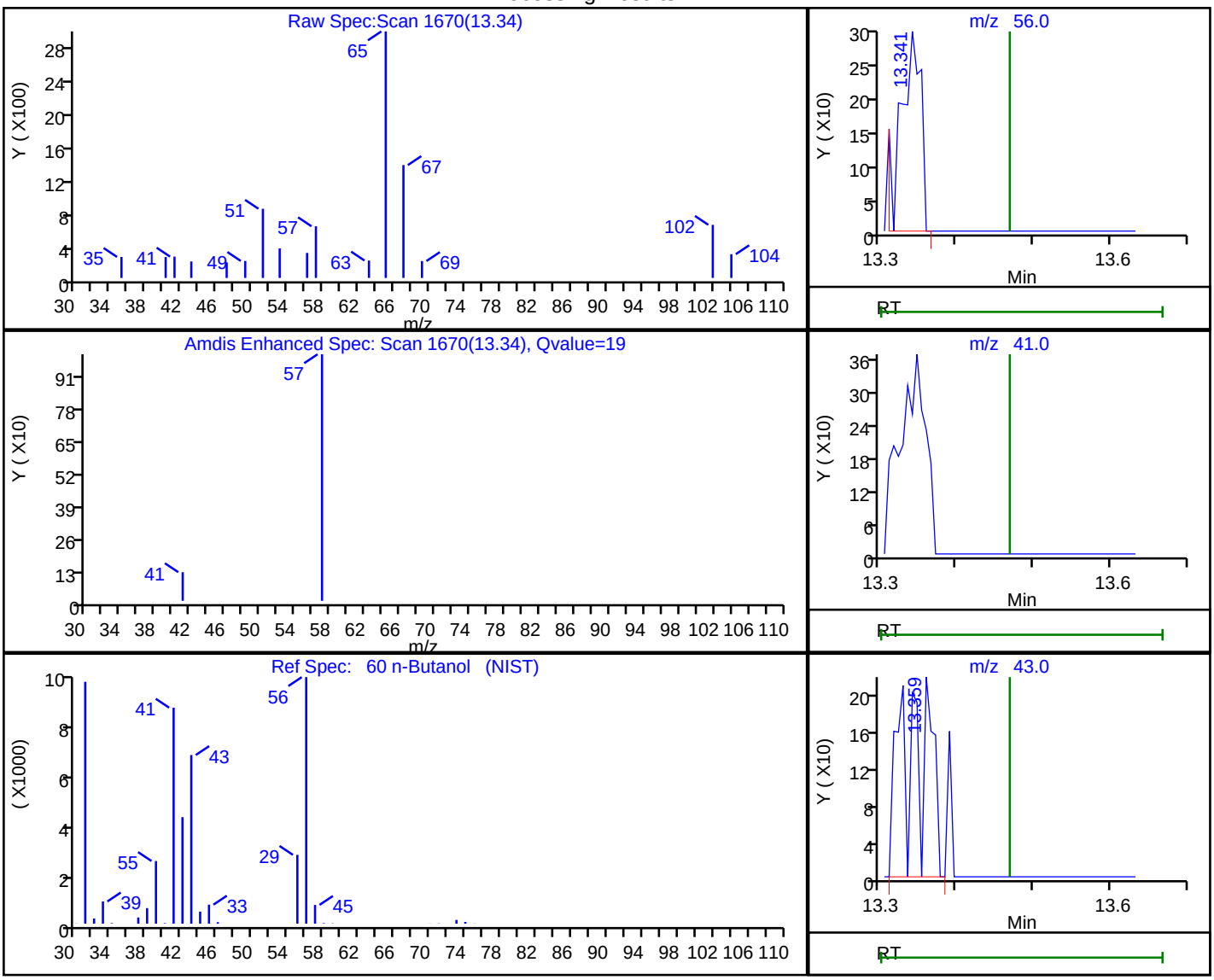
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

60 n-Butanol, CAS: 71-36-3

Processing Results



RT	Mass	Response	Amount
13.34	56.00	548	0.053267
13.35	41.00	849	
13.36	43.00	519	

Reviewer: leeh, 07-Nov-2018 10:57:55

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

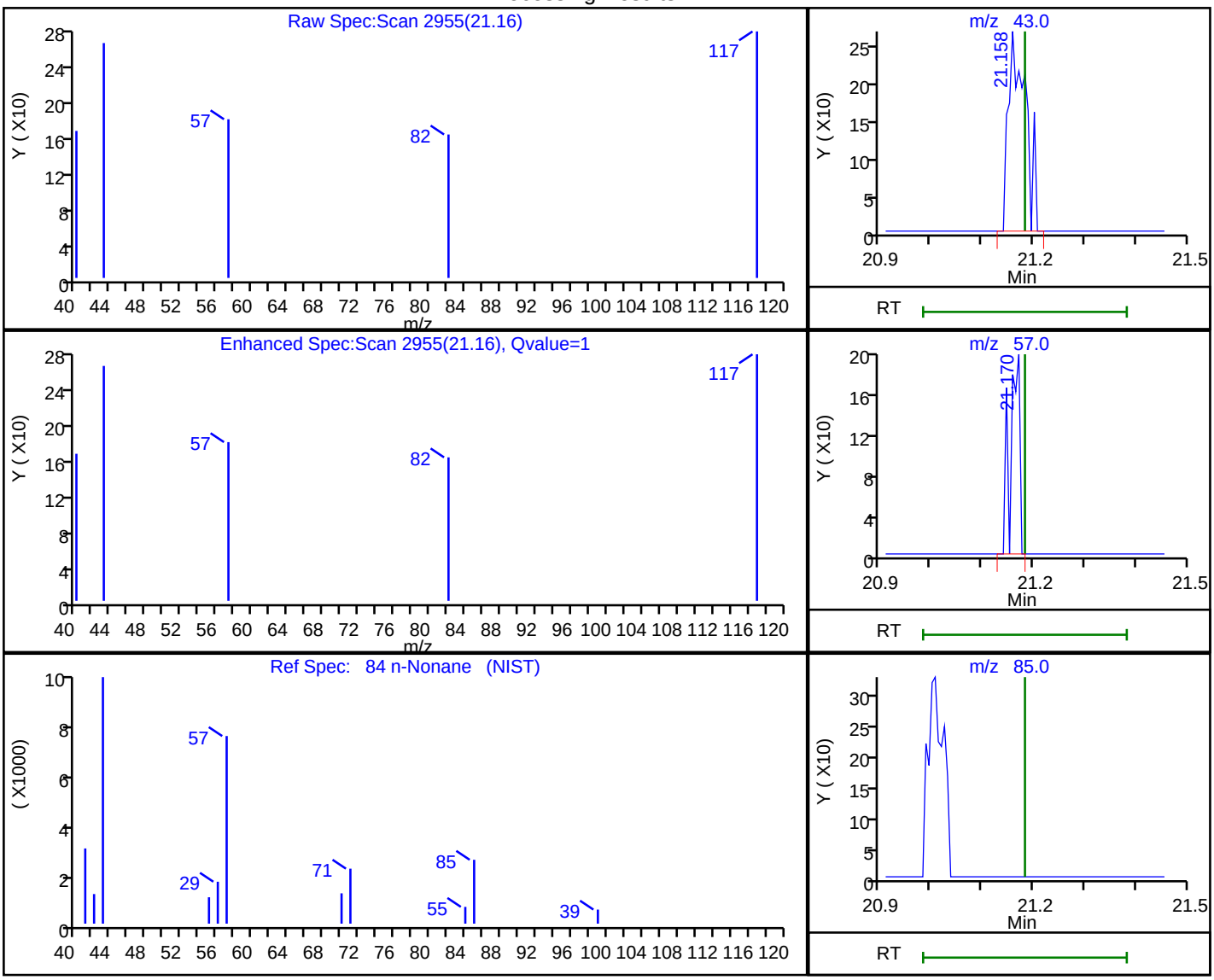
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20181106-67193.b\MS7110625.D				
Injection Date:	07-Nov-2018 07:25:30	Instrument ID:	ATMS7		
Lims ID:	320-44921-A-1	Lab Sample ID:	320-44921-1		
Client ID:	34000438				
Operator ID:	SV	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

84 n-Nonane, CAS: 111-84-2

Processing Results



RT	Mass	Response	Amount
21.16	43.00	617	0.016570
21.17	57.00	255	
21.18	85.00	0	

Reviewer: leeh, 07-Nov-2018 10:58:11

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-48226-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1

For:
Chesapeake Energy Corporation
PO BOX 548806
Oklahoma City, Oklahoma 73154

Attn: Chase Acker

Cathy Gartner

Authorized for release by:
4/2/2019 4:02:16 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Qualifiers

Air - GC/MS VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-48226-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-48226-1

Comments
No additional comments.

Receipt
The sample was received on 3/11/2019 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
Method(s) TO-15: Surrogate recovery for the following sample was outside control limits: 20190307 M SVE (320-48226-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) TO-15: The continuing calibration verification (CCV) associated with batch 320-282816 recovered above the upper control limit for Hexachlorobutadiene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Client Sample ID: 20190307 M SVE — Lab Sample ID: 320-48226-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	40.1		1.78		ppb v/v	4.45		TO-15	Total/NA
2-Butanone (MEK)	5.97		3.56		ppb v/v	4.45		TO-15	Total/NA
Ethylbenzene	284		1.78		ppb v/v	4.45		TO-15	Total/NA
4-Ethyltoluene	167		1.78		ppb v/v	4.45		TO-15	Total/NA
Toluene	38.8		1.78		ppb v/v	4.45		TO-15	Total/NA
1,2,4-Trimethylbenzene	83.0		3.56		ppb v/v	4.45		TO-15	Total/NA
1,3,5-Trimethylbenzene	67.0		1.78		ppb v/v	4.45		TO-15	Total/NA
m,p-Xylene	442		3.56		ppb v/v	4.45		TO-15	Total/NA
o-Xylene	137		1.78		ppb v/v	4.45		TO-15	Total/NA
Total VOC as Hexane (C6-C12)	77900		445		ppb v/v	4.45		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 20190307 M SVE

Date Collected: 03/07/19 07:42
Date Received: 03/11/19 09:30
Sample Container: Summa Canister 6L

Lab Sample ID: 320-48226-1

Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		22.3		ppb v/v			03/20/19 23:53	4.45
Benzene	**40.1**		1.78		ppb v/v			03/20/19 23:53	4.45
Benzyl chloride	ND		3.56		ppb v/v			03/20/19 23:53	4.45
Bromodichloromethane	ND		1.34		ppb v/v			03/20/19 23:53	4.45
Bromoform	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Bromomethane	ND		3.56		ppb v/v			03/20/19 23:53	4.45
2-Butanone (MEK)	**5.97**		3.56		ppb v/v			03/20/19 23:53	4.45
Carbon disulfide	ND		3.56		ppb v/v			03/20/19 23:53	4.45
Carbon tetrachloride	ND		3.56		ppb v/v			03/20/19 23:53	4.45
Chlorobenzene	ND		1.34		ppb v/v			03/20/19 23:53	4.45
Dibromochloromethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Chloroethane	ND		3.56		ppb v/v			03/20/19 23:53	4.45
Chloroform	ND		1.34		ppb v/v			03/20/19 23:53	4.45
Chloromethane	ND		3.56		ppb v/v			03/20/19 23:53	4.45
1,2-Dibromoethane (EDB)	ND		3.56		ppb v/v			03/20/19 23:53	4.45
1,2-Dichlorobenzene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,3-Dichlorobenzene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,4-Dichlorobenzene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Dichlorodifluoromethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,1-Dichloroethane	ND		1.34		ppb v/v			03/20/19 23:53	4.45
1,2-Dichloroethane	ND		3.56		ppb v/v			03/20/19 23:53	4.45
1,1-Dichloroethene	ND		3.56		ppb v/v			03/20/19 23:53	4.45
cis-1,2-Dichloroethene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
trans-1,2-Dichloroethene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,2-Dichloropropane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
cis-1,3-Dichloropropene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
trans-1,3-Dichloropropene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Ethylbenzene	**284**		1.78		ppb v/v			03/20/19 23:53	4.45
4-Ethyltoluene	**167**		1.78		ppb v/v			03/20/19 23:53	4.45
Hexachlorobutadiene	ND		8.90		ppb v/v			03/20/19 23:53	4.45
2-Hexanone	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Methylene Chloride	ND		1.78		ppb v/v			03/20/19 23:53	4.45
4-Methyl-2-pentanone (MIBK)	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Styrene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,1,2,2-Tetrachloroethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Tetrachloroethene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Toluene	**38.8**		1.78		ppb v/v			03/20/19 23:53	4.45
1,2,4-Trichlorobenzene	ND		8.90		ppb v/v			03/20/19 23:53	4.45
1,1,1-Trichloroethane	ND		1.34		ppb v/v			03/20/19 23:53	4.45
1,1,2-Trichloroethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Trichloroethene	ND		1.78		ppb v/v			03/20/19 23:53	4.45
Trichlorofluoromethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.78		ppb v/v			03/20/19 23:53	4.45
1,2,4-Trimethylbenzene	**83.0**		3.56		ppb v/v			03/20/19 23:53	4.45
1,3,5-Trimethylbenzene	**67.0**		1.78		ppb v/v			03/20/19 23:53	4.45
Vinyl acetate	ND		3.56		ppb v/v			03/20/19 23:53	4.45
Vinyl chloride	ND		1.78		ppb v/v			03/20/19 23:53	4.45

Client Sample ID: 20190307 M SVE
Date Collected: 03/07/19 07:42
Date Received: 03/11/19 09:30
Sample Container: Summa Canister 6L

Lab Sample ID: 320-48226-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	442		3.56		ppb v/v			03/20/19 23:53	4.45
o-Xylene	137		1.78		ppb v/v			03/20/19 23:53	4.45
Total VOC as Hexane (C6-C12)	77900		445		ppb v/v			03/20/19 23:53	4.45

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*172*	*X*	*70 - 130*		*03/20/19 23:53*	*4.45*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*03/20/19 23:53*	*4.45*
Toluene-d8 (Surr)	*104*		*70 - 130*		*03/20/19 23:53*	*4.45*

Surrogate Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DCA	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-48226-1	20190307 M SVE	172 X	99	104
LCS 320-282816/3	Lab Control Sample	102	97	99
LCSD 320-282816/4	Lab Control Sample Dup	102	97	99
MB 320-282816/7	Method Blank	77	90	98

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-282816/7
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.00		ppb v/v			03/20/19 16:22	1
Benzene	ND		0.400		ppb v/v			03/20/19 16:22	1
Benzyl chloride	ND		0.800		ppb v/v			03/20/19 16:22	1
Bromodichloromethane	ND		0.300		ppb v/v			03/20/19 16:22	1
Bromoform	ND		0.400		ppb v/v			03/20/19 16:22	1
Bromomethane	ND		0.800		ppb v/v			03/20/19 16:22	1
2-Butanone (MEK)	ND		0.800		ppb v/v			03/20/19 16:22	1
Carbon disulfide	ND		0.800		ppb v/v			03/20/19 16:22	1
Carbon tetrachloride	ND		0.800		ppb v/v			03/20/19 16:22	1
Chlorobenzene	ND		0.300		ppb v/v			03/20/19 16:22	1
Dibromochloromethane	ND		0.400		ppb v/v			03/20/19 16:22	1
Chloroethane	ND		0.800		ppb v/v			03/20/19 16:22	1
Chloroform	ND		0.300		ppb v/v			03/20/19 16:22	1
Chloromethane	ND		0.800		ppb v/v			03/20/19 16:22	1
1,2-Dibromoethane (EDB)	ND		0.800		ppb v/v			03/20/19 16:22	1
1,2-Dichlorobenzene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,3-Dichlorobenzene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,4-Dichlorobenzene	ND		0.400		ppb v/v			03/20/19 16:22	1
Dichlorodifluoromethane	ND		0.400		ppb v/v			03/20/19 16:22	1
1,1-Dichloroethane	ND		0.300		ppb v/v			03/20/19 16:22	1
1,2-Dichloroethane	ND		0.800		ppb v/v			03/20/19 16:22	1
1,1-Dichloroethene	ND		0.800		ppb v/v			03/20/19 16:22	1
cis-1,2-Dichloroethene	ND		0.400		ppb v/v			03/20/19 16:22	1
trans-1,2-Dichloroethene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,2-Dichloropropane	ND		0.400		ppb v/v			03/20/19 16:22	1
cis-1,3-Dichloropropene	ND		0.400		ppb v/v			03/20/19 16:22	1
trans-1,3-Dichloropropene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.400		ppb v/v			03/20/19 16:22	1
Ethylbenzene	ND		0.400		ppb v/v			03/20/19 16:22	1
4-Ethyltoluene	ND		0.400		ppb v/v			03/20/19 16:22	1
Hexachlorobutadiene	ND		2.00		ppb v/v			03/20/19 16:22	1
2-Hexanone	ND		0.400		ppb v/v			03/20/19 16:22	1
Methylene Chloride	ND		0.400		ppb v/v			03/20/19 16:22	1
4-Methyl-2-pentanone (MIBK)	ND		0.400		ppb v/v			03/20/19 16:22	1
Styrene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,1,2,2-Tetrachloroethane	ND		0.400		ppb v/v			03/20/19 16:22	1
Tetrachloroethene	ND		0.400		ppb v/v			03/20/19 16:22	1
Toluene	ND		0.400		ppb v/v			03/20/19 16:22	1
1,2,4-Trichlorobenzene	ND		2.00		ppb v/v			03/20/19 16:22	1
1,1,1-Trichloroethane	ND		0.300		ppb v/v			03/20/19 16:22	1
1,1,2-Trichloroethane	ND		0.400		ppb v/v			03/20/19 16:22	1
Trichloroethene	ND		0.400		ppb v/v			03/20/19 16:22	1
Trichlorofluoromethane	ND		0.400		ppb v/v			03/20/19 16:22	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.400		ppb v/v			03/20/19 16:22	1
1,2,4-Trimethylbenzene	ND		0.800		ppb v/v			03/20/19 16:22	1
1,3,5-Trimethylbenzene	ND		0.400		ppb v/v			03/20/19 16:22	1
Vinyl acetate	ND		0.800		ppb v/v			03/20/19 16:22	1
Vinyl chloride	ND		0.400		ppb v/v			03/20/19 16:22	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-282816/7
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.800		ppb v/v			03/20/19 16:22	1
o-Xylene	ND		0.400		ppb v/v			03/20/19 16:22	1
Total VOC as Hexane (C6-C12)	ND		100		ppb v/v			03/20/19 16:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*77*		*70 - 130*		*03/20/19 16:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*		*03/20/19 16:22*	*1*
Toluene-d8 (Surr)	*98*		*70 - 130*		*03/20/19 16:22*	*1*

Lab Sample ID: LCS 320-282816/3
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	21.1	17.80		ppb v/v		84	65 - 125
Benzene	21.2	20.84		ppb v/v		98	68 - 128
Benzyl chloride	20.9	23.88		ppb v/v		114	67 - 127
Bromodichloromethane	21.1	19.70		ppb v/v		94	71 - 131
Bromoform	21.1	20.18		ppb v/v		96	66 - 126
Bromomethane	21.1	19.28		ppb v/v		91	73 - 134
2-Butanone (MEK)	21.1	19.17		ppb v/v		91	73 - 133
Carbon disulfide	21.1	18.22		ppb v/v		86	71 - 131
Carbon tetrachloride	21.1	19.93		ppb v/v		94	63 - 126
Chlorobenzene	21.1	18.86		ppb v/v		89	63 - 123
Dibromochloromethane	21.0	19.01		ppb v/v		90	66 - 126
Chloroethane	21.1	20.49		ppb v/v		97	73 - 133
Chloroform	21.2	19.86		ppb v/v		94	70 - 130
Chloromethane	21.0	19.71		ppb v/v		94	61 - 140
1,2-Dibromoethane (EDB)	21.1	19.39		ppb v/v		92	64 - 124
1,2-Dichlorobenzene	21.1	24.38		ppb v/v		116	62 - 126
1,3-Dichlorobenzene	20.9	23.63		ppb v/v		113	59 - 130
1,4-Dichlorobenzene	21.2	24.76		ppb v/v		117	58 - 132
Dichlorodifluoromethane	21.1	19.01		ppb v/v		90	69 - 129
1,1-Dichloroethane	21.2	20.33		ppb v/v		96	71 - 131
1,2-Dichloroethane	21.2	19.90		ppb v/v		94	71 - 131
1,1-Dichloroethene	21.2	20.04		ppb v/v		94	72 - 132
cis-1,2-Dichloroethene	21.1	20.70		ppb v/v		98	70 - 130
trans-1,2-Dichloroethene	21.1	20.60		ppb v/v		98	72 - 132
1,2-Dichloropropane	21.1	19.93		ppb v/v		95	72 - 132
cis-1,3-Dichloropropene	22.0	21.43		ppb v/v		98	72 - 132
trans-1,3-Dichloropropene	20.5	20.51		ppb v/v		100	66 - 126
1,2-Dichloro-1,1,2,2-tetrafluoroethane	21.0	17.91		ppb v/v		85	74 - 134
Ethylbenzene	21.1	19.21		ppb v/v		91	64 - 124
4-Ethyltoluene	20.9	19.53		ppb v/v		93	66 - 129
Hexachlorobutadiene	20.9	26.86		ppb v/v		128	58 - 131
2-Hexanone	21.0	20.99		ppb v/v		100	69 - 129
Methylene Chloride	21.1	20.36		ppb v/v		97	67 - 127

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-282816/3
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Methyl-2-pentanone (MIBK)	21.1	18.84		ppb v/v		89	74 - 134
Styrene	21.1	19.78		ppb v/v		94	67 - 127
1,1,2,2-Tetrachloroethane	21.2	21.30		ppb v/v		101	64 - 124
Tetrachloroethene	21.2	19.84		ppb v/v		94	63 - 123
Toluene	21.1	19.50		ppb v/v		92	68 - 128
1,2,4-Trichlorobenzene	20.9	25.18		ppb v/v		120	58 - 138
1,1,1-Trichloroethane	21.1	19.46		ppb v/v		92	69 - 129
1,1,2-Trichloroethane	21.2	18.69		ppb v/v		88	64 - 124
Trichloroethene	21.2	20.28		ppb v/v		96	70 - 130
Trichlorofluoromethane	21.0	18.08		ppb v/v		86	71 - 131
1,1,2-Trichloro-1,2,2-trifluoroethane	21.1	18.77		ppb v/v		89	70 - 130
1,2,4-Trimethylbenzene	21.1	21.91		ppb v/v		104	60 - 132
1,3,5-Trimethylbenzene	21.0	21.48		ppb v/v		102	65 - 125
Vinyl acetate	22.0	21.90		ppb v/v		100	65 - 134
Vinyl chloride	21.1	18.99		ppb v/v		90	59 - 152
Hexane	21.1	20.44		ppb v/v		97	70 - 130
m,p-Xylene	42.1	38.78		ppb v/v		92	65 - 125
o-Xylene	21.1	19.17		ppb v/v		91	65 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*
Toluene-d8 (Surr)	*99*		*70 - 130*

Lab Sample ID: LCSD 320-282816/4
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	21.1	17.81		ppb v/v		84	65 - 125	0	25
Benzene	21.2	20.25		ppb v/v		95	68 - 128	3	25
Benzyl chloride	20.9	24.84		ppb v/v		119	67 - 127	4	25
Bromodichloromethane	21.1	19.17		ppb v/v		91	71 - 131	3	25
Bromoform	21.1	20.72		ppb v/v		98	66 - 126	3	25
Bromomethane	21.1	19.48		ppb v/v		92	73 - 134	1	25
2-Butanone (MEK)	21.1	19.72		ppb v/v		93	73 - 133	3	25
Carbon disulfide	21.1	18.15		ppb v/v		86	71 - 131	0	25
Carbon tetrachloride	21.1	19.49		ppb v/v		92	63 - 126	2	25
Chlorobenzene	21.1	18.78		ppb v/v		89	63 - 123	0	25
Dibromochloromethane	21.0	18.95		ppb v/v		90	66 - 126	0	25
Chloroethane	21.1	20.53		ppb v/v		97	73 - 133	0	25
Chloroform	21.2	19.45		ppb v/v		92	70 - 130	2	25
Chloromethane	21.0	19.80		ppb v/v		94	61 - 140	0	25
1,2-Dibromoethane (EDB)	21.1	19.28		ppb v/v		91	64 - 124	1	25
1,2-Dichlorobenzene	21.1	24.46		ppb v/v		116	62 - 126	0	25
1,3-Dichlorobenzene	20.9	23.66		ppb v/v		113	59 - 130	0	25
1,4-Dichlorobenzene	21.2	24.86		ppb v/v		117	58 - 132	0	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-282816/4
Matrix: Air
Analysis Batch: 282816

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane			21.1	19.36		ppb v/v		92	69 - 129	2	25
1,1-Dichloroethane			21.2	19.97		ppb v/v		94	71 - 131	2	25
1,2-Dichloroethane			21.2	19.39		ppb v/v		91	71 - 131	3	25
1,1-Dichloroethene			21.2	19.81		ppb v/v		93	72 - 132	1	25
cis-1,2-Dichloroethene			21.1	20.11		ppb v/v		95	70 - 130	3	25
trans-1,2-Dichloroethene			21.1	20.34		ppb v/v		96	72 - 132	1	25
1,2-Dichloropropane			21.1	19.42		ppb v/v		92	72 - 132	3	25
cis-1,3-Dichloropropene			22.0	21.01		ppb v/v		96	72 - 132	2	25
trans-1,3-Dichloropropene			20.5	20.40		ppb v/v		99	66 - 126	1	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			21.0	18.08		ppb v/v		86	74 - 134	1	25
Ethylbenzene			21.1	19.38		ppb v/v		92	64 - 124	1	25
4-Ethyltoluene			20.9	19.93		ppb v/v		95	66 - 129	2	25
Hexachlorobutadiene			20.9	26.75		ppb v/v		128	58 - 131	0	25
2-Hexanone			21.0	21.56		ppb v/v		103	69 - 129	3	25
Methylene Chloride			21.1	20.07		ppb v/v		95	67 - 127	1	25
4-Methyl-2-pentanone (MIBK)			21.1	19.35		ppb v/v		92	74 - 134	3	25
Styrene			21.1	20.23		ppb v/v		96	67 - 127	2	25
1,1,2,2-Tetrachloroethane			21.2	21.81		ppb v/v		103	64 - 124	2	25
Tetrachloroethene			21.2	19.56		ppb v/v		92	63 - 123	1	25
Toluene			21.1	19.10		ppb v/v		90	68 - 128	2	25
1,2,4-Trichlorobenzene			20.9	25.15		ppb v/v		120	58 - 138	0	25
1,1,1-Trichloroethane			21.1	19.13		ppb v/v		91	69 - 129	2	25
1,1,2-Trichloroethane			21.2	18.53		ppb v/v		87	64 - 124	1	25
Trichloroethene			21.2	19.83		ppb v/v		94	70 - 130	2	25
Trichlorofluoromethane			21.0	18.03		ppb v/v		86	71 - 131	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane			21.1	18.59		ppb v/v		88	70 - 130	1	25
1,2,4-Trimethylbenzene			21.1	22.08		ppb v/v		105	60 - 132	1	25
1,3,5-Trimethylbenzene			21.0	21.64		ppb v/v		103	65 - 125	1	25
Vinyl acetate			22.0	21.67		ppb v/v		99	65 - 134	1	25
Vinyl chloride			21.1	19.14		ppb v/v		91	59 - 152	1	25
Hexane			21.1	19.95		ppb v/v		95	70 - 130	2	25
m,p-Xylene			42.1	39.44		ppb v/v		94	65 - 125	2	25
o-Xylene			21.1	19.55		ppb v/v		93	65 - 125	2	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*
Toluene-d8 (Surr)	*99*		*70 - 130*

QC Association Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Air - GC/MS VOA

Analysis Batch: 282816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-48226-1	20190307 M SVE	Total/NA	Air	TO-15	
MB 320-282816/7	Method Blank	Total/NA	Air	TO-15	
LCS 320-282816/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-282816/4	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Client Sample ID: 20190307 M SVE
Date Collected: 03/07/19 07:42
Date Received: 03/11/19 09:30

Lab Sample ID: 320-48226-1
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		4.45	85 mL	250 mL	282816	03/20/19 23:53	RS1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD / DOE		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-20
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19 *
Hawaii	State Program	9	N/A	01-29-20
Illinois	NELAP	5	200060	03-17-19 *
Kansas	NELAP	7	E-10375	10-31-19
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19 *
Oregon	NELAP	10	4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-19 *
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19 *
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19 *
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-19
Wyoming	State Program	8	8TMS-L	01-28-19 *

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 320-48226-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-48226-1	20190307 M SVE	Air	03/07/19 07:42	03/11/19 09:30

CHAIN OF CUSTODY RECORD

No. 1051

EQUUS

PROJECT NUMBER: CHKSTATM H18001	PROJECT NAME: CHK STATE M	COC 1 of 1	
SHIPPED TO: TA-320	PROJECT MANAGER: DAVID BRADY	TAT: STANDARD	

SAMPLER'S PRINTED NAME: TERRY FISHER

SAMPLER'S SIGNATURE:

ASOW: N/A

TAG # 34000349

CAN #

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	TO-15 TOTAL VOCs & HEXANE	REMARKS
3/7/19	0742	20190307 M SVE	Air	1	X X	

320-49226 Chain of Custody

TOTAL NUMBER OF CONTAINERS → 1

RELINQUISHED BY:	DATE 3-7-19	RECEIVED BY: Emily James TA-SAC	DATE 3/11/19
	TIME 1400		TIME 9:30
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

METHOD OF SHIPMENT: FEDEX

AIRBILL NUMBER: 7746 1922 1168

RECEIVED IN LABORATORY BY: DATE / TIME

Send PDF, EDD, and INVOICE (if applicable) to: GAQC@EQUUSENV.COM

LABORATORY CONTACT: CATHY GARDNER PHONE: 615-301-5041

LABORATORY ADDRESS: 880 RIVERSIDE PARKWAY W. SACRAMENTO, CA 95605

POINT OF ORIGIN:

4/2/2019

Login Sample Receipt Checklist

Client: Chesapeake Energy Corporation

Job Number: 320-48226-1
SDG Number: Property ID: 891077

Login Number: 48226
List Number: 1
Creator: James, Emily M

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: C 01-24-19

Date of QC: 1/26/19

320-47076 Chain of Custody

Data File Number: MS6 012617

(File ID for certification analysis of canister designated below)

CANISTER ID NUMBERS

*	34000349
	34002100
	8257
	7792
	34002011
	34000565
	34000189
	34001389
	34001140
	34001578
	34000894
	34000069

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED

JW for AP
1st Level Reviewed By

1/28/19
Date

2nd Level Reviewed By

2/12/19
Date

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-47076-1

SDG No.:

Client Sample ID: 34000349 Lab Sample ID: 320-47076-1

Matrix: Air Lab File ID: MS6012617.D

Analysis Method: TO-15 Date Collected: 01/24/2019 00:00

Sample wt/vol: 500(mL) Date Analyzed: 01/27/2019 02:01

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 272642 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	0.23	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	0.083	J B	0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-47076-1

SDG No.:

Client Sample ID: 34000349 Lab Sample ID: 320-47076-1

Matrix: Air Lab File ID: MS6012617.D

Analysis Method: TO-15 Date Collected: 01/24/2019 00:00

Sample wt/vol: 500(mL) Date Analyzed: 01/27/2019 02:01

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 272642 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	ND		0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	0.35	J B	0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-47076-1

SDG No.:

Client Sample ID: 34000349 Lab Sample ID: 320-47076-1

Matrix: Air Lab File ID: MS6012617.D

Analysis Method: TO-15 Date Collected: 01/24/2019 00:00

Sample wt/vol: 500(mL) Date Analyzed: 01/27/2019 02:01

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 272642 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074
87-61-6	1,2,3-Trichlorobenzene	ND		2.0	0.62
60-29-7	Ethyl ether	ND		0.80	0.20
71-36-3	n-Butanol	ND		2.0	0.26
111-84-2	n-Nonane	ND		0.80	0.058

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	92		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-130
2037-26-5	Toluene-d8 (Surr)	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D
Lims ID: 320-47076-A-1
Client ID: 34000349
Sample Type: Client
Inject. Date: 27-Jan-2019 02:01:30 ALS Bottle#: 10 Worklist Smp#: 17
Purge Vol: 25.000 mL Dil. Factor: 1.0000
Sample Info: 320-47076-A-1
Misc. Info.: 500 mL CAN CERT
Operator ID: LHS Instrument ID: ATMS6

Method: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\TO15_ATMS6.m
Limit Group: MSA - TO15 - ICAL
Last Update: 28-Jan-2019 13:32:59 Calib Date: 23-Jan-2019 12:15:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Sacramento\ChromData\ATMS6\20190122-70871.b\MS6012224.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: CTX0312

First Level Reviewer: phanthasena Date: 28-Jan-2019 13:32:59

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	11.024	11.036	-0.012	96	137910	4.00	
* 2 1,4-Difluorobenzene	114	13.196	13.202	-0.006	95	512705	4.00	
* 3 Chlorobenzene-d5 (IS)	117	19.961	19.967	-0.006	89	392329	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	12.235	12.241	-0.006	41	207637	4.05	
$ 5 Toluene-d8 (Surr)	100	16.596	16.596	0.000	98	334545	4.10	
$ 6 4-Bromofluorobenzene (Surr	95	22.589	22.589	0.000	0	205920	3.69	
11 Propene	41	3.188	3.160	0.024	93	8430	0.3513	
32 Acetone	43	6.254	6.235	0.012	93	10691	0.2343	
39 Methylene Chloride	49	7.526	7.524	-0.006	34	888	0.0251	
40 Carbon disulfide	76	7.550	7.542	0.000	96	6053	0.0835	
60 n-Butanol	56	12.362	12.306	0.042	63	2730	0.1247	

Reagents:

VAMSIS20_00265 Amount Added: 50.00 Units: mL Run Reagent

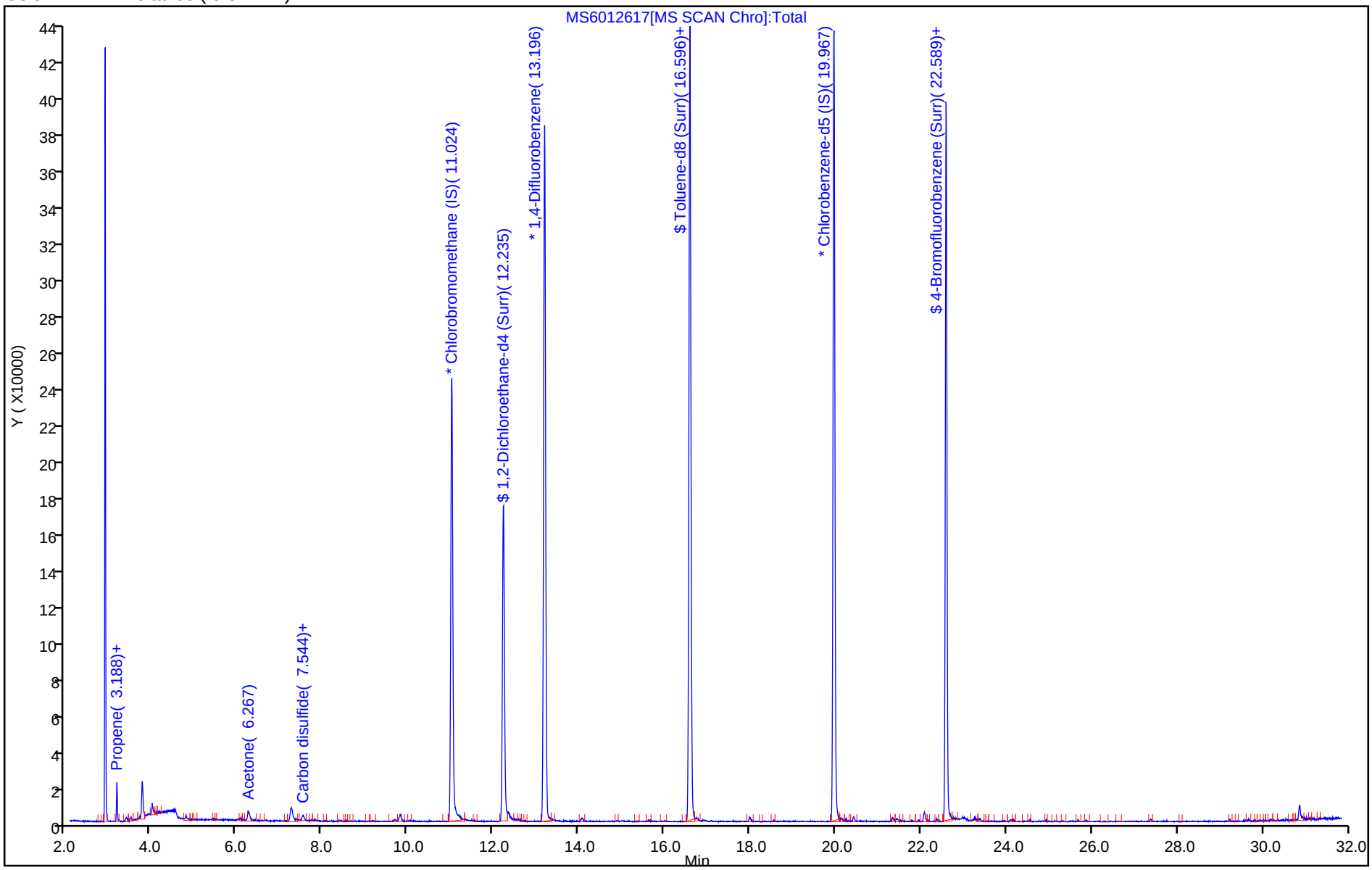
Report Date: 28-Jan-2019 13:33:00 Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Sacramento

Data File: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D

Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6	Operator ID:	LHS
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1	Worklist Smp#:	17
Client ID:	34000349				
Purge Vol:	25.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



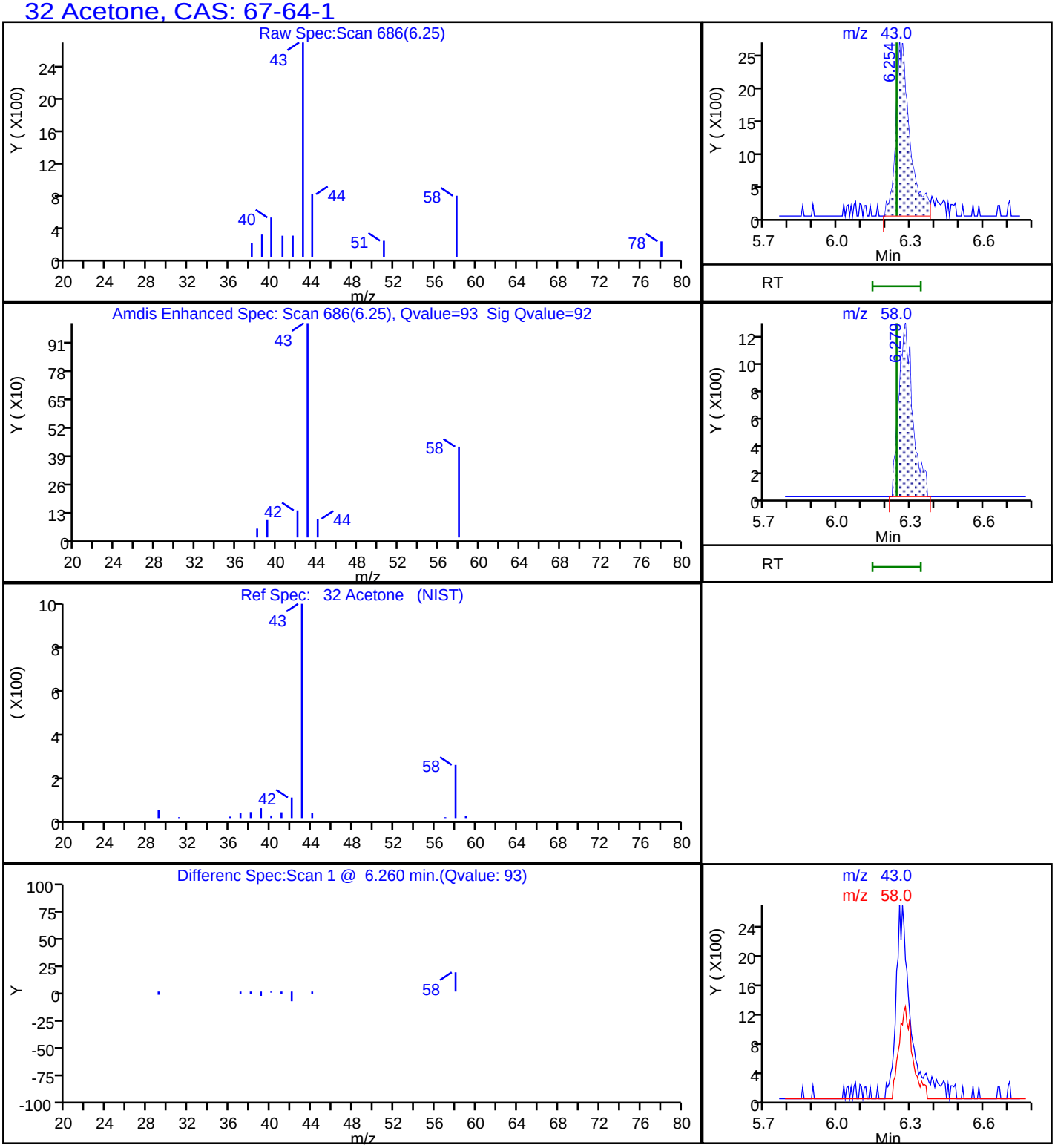
Report Date: 28-Jan-2019 13:33:00 Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Sacramento

Data File: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D

Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1



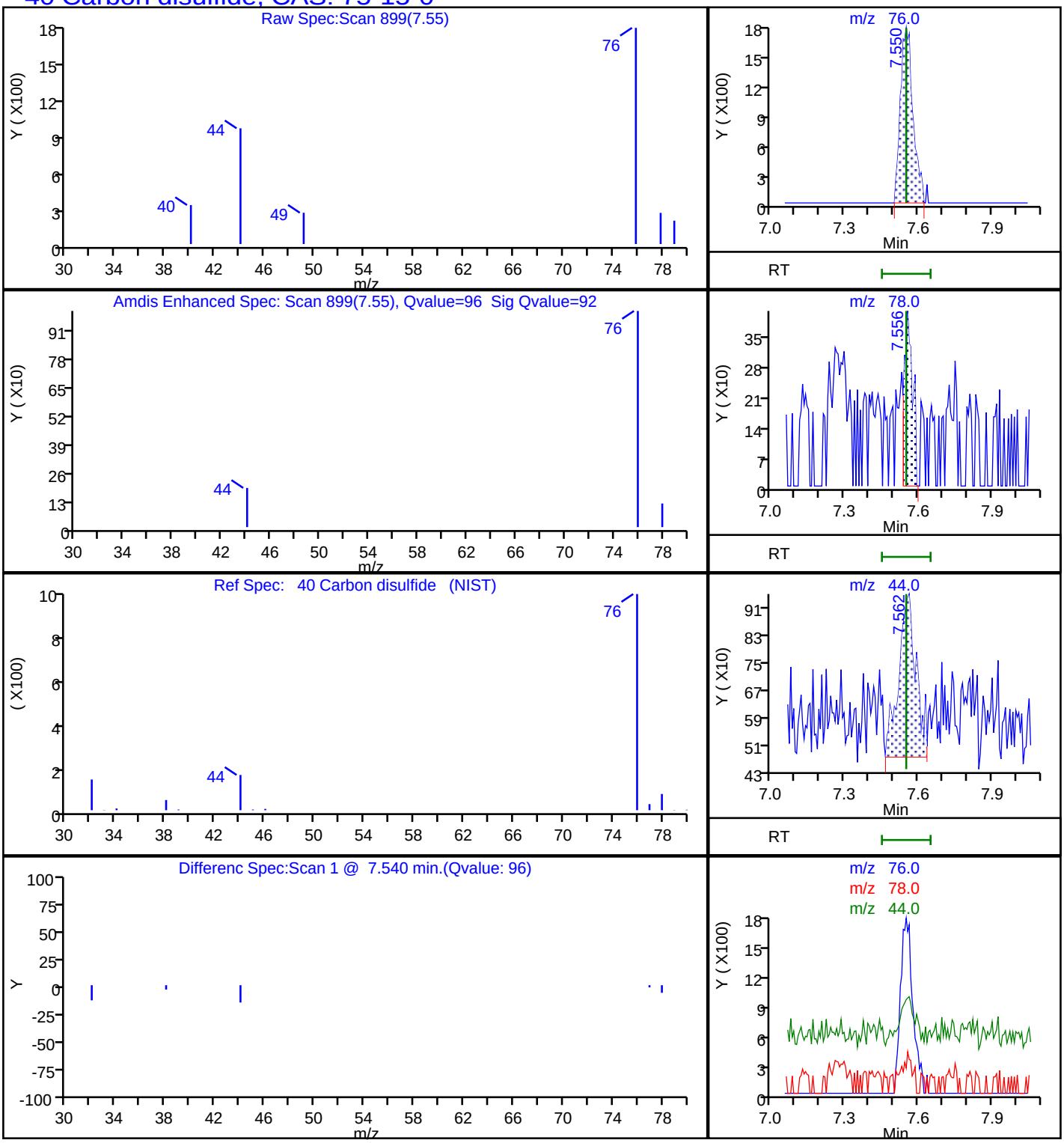
Report Date: 28-Jan-2019 13:33:00 Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Sacramento

Data File: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D

Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

40 Carbon disulfide, CAS: 75-15-0



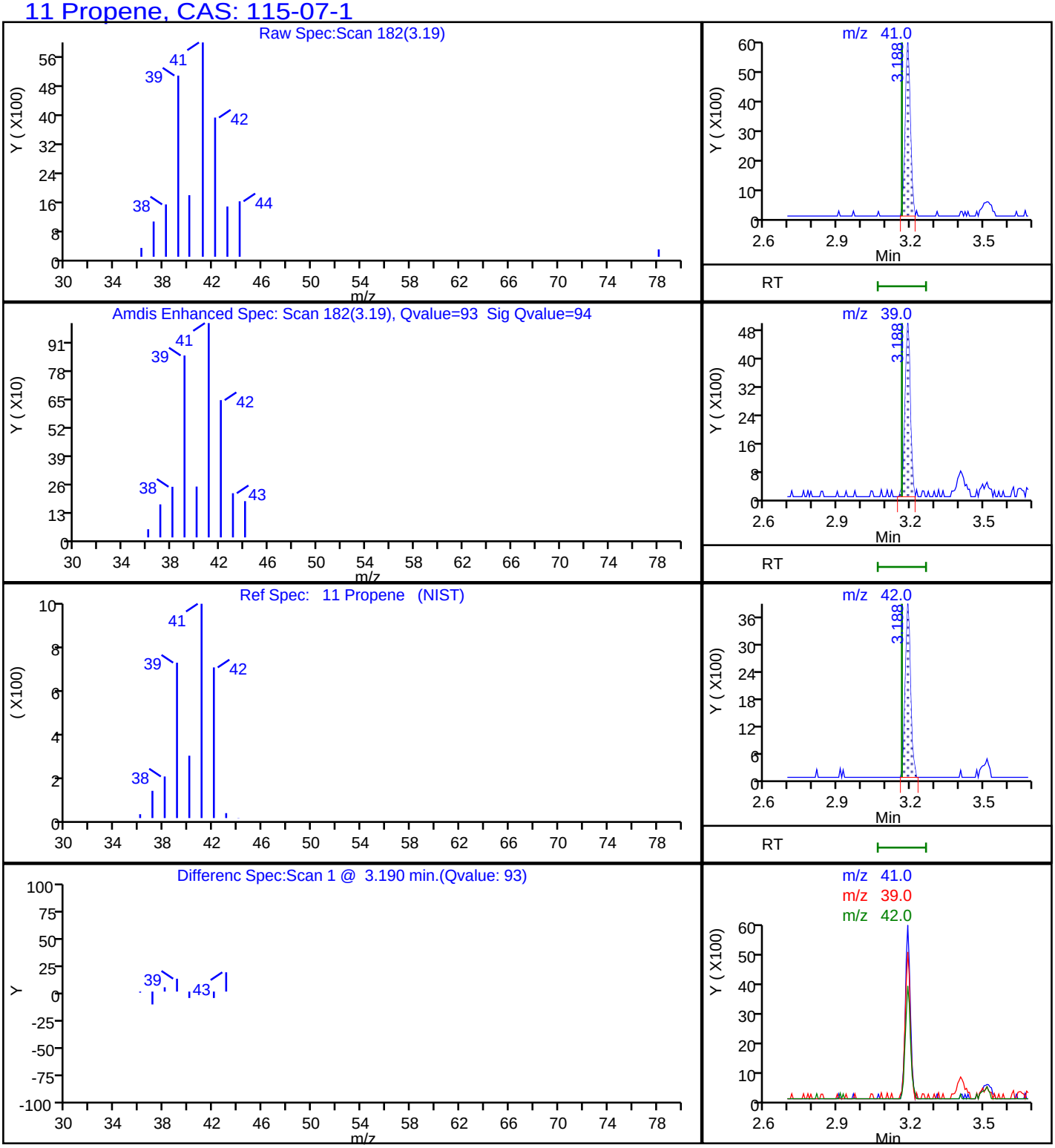
Report Date: 28-Jan-2019 13:33:00 Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Sacramento

Data File: \\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D

Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

11 Propene, CAS: 115-07-1



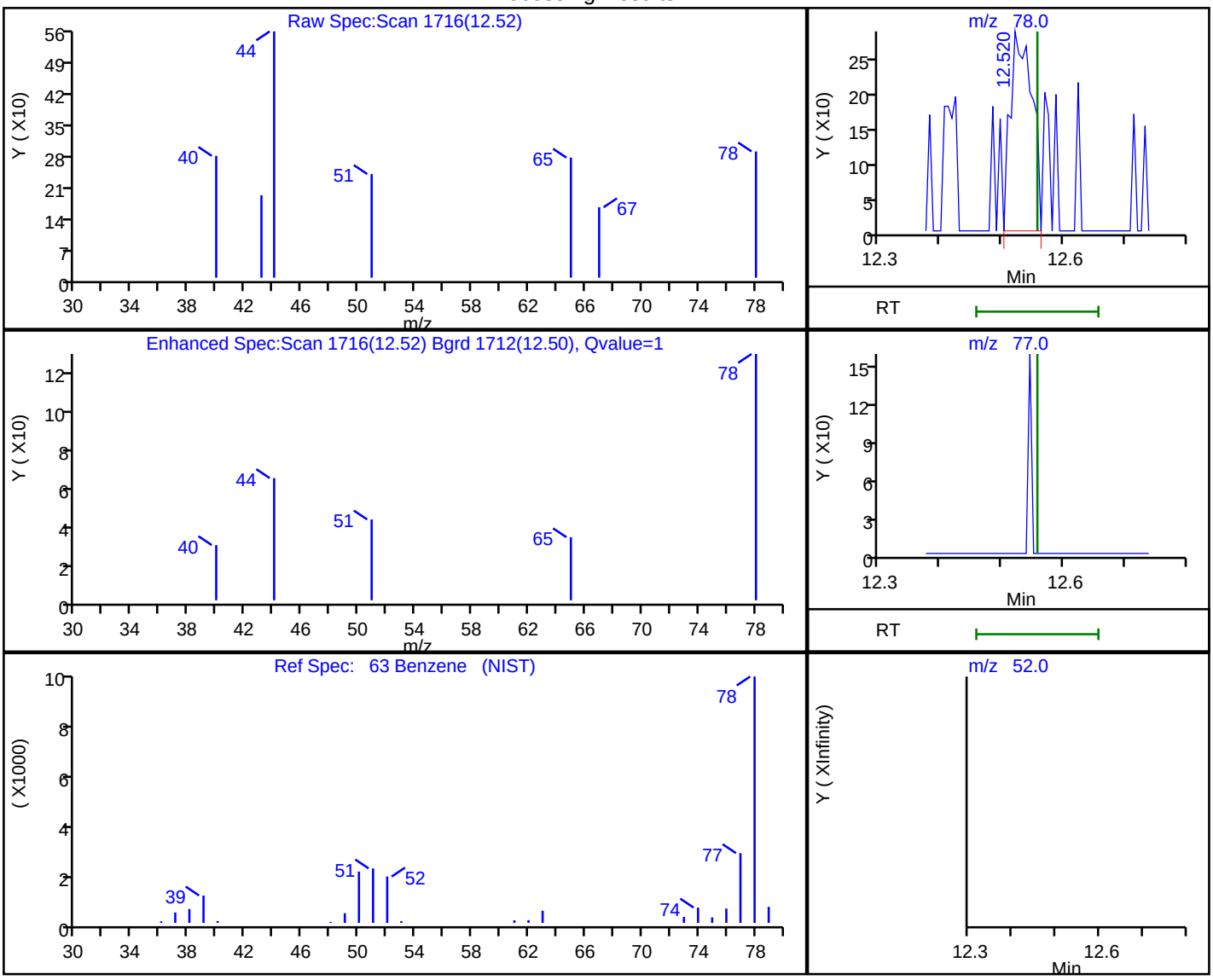
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

63 Benzene, CAS: 71-43-2

Processing Results



RT	Mass	Response	Amount
12.52	78.00	702	0.007309
12.56	77.00	0	
12.56	52.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:13

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

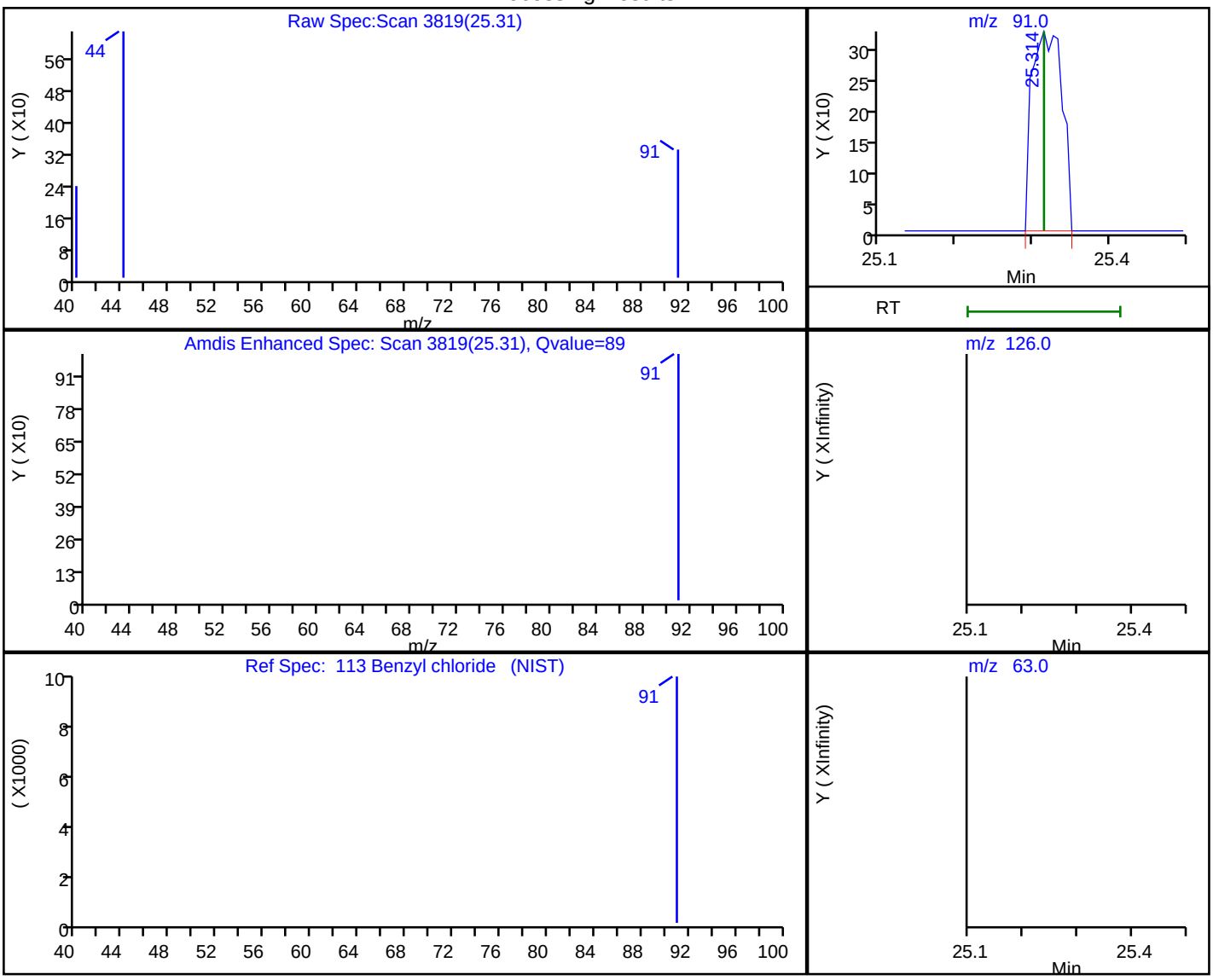
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

113 Benzyl chloride, CAS: 100-44-7

Processing Results



RT	Mass	Response	Amount
25.31	91.00	886	0.008083
25.31	126.00	0	
25.31	63.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

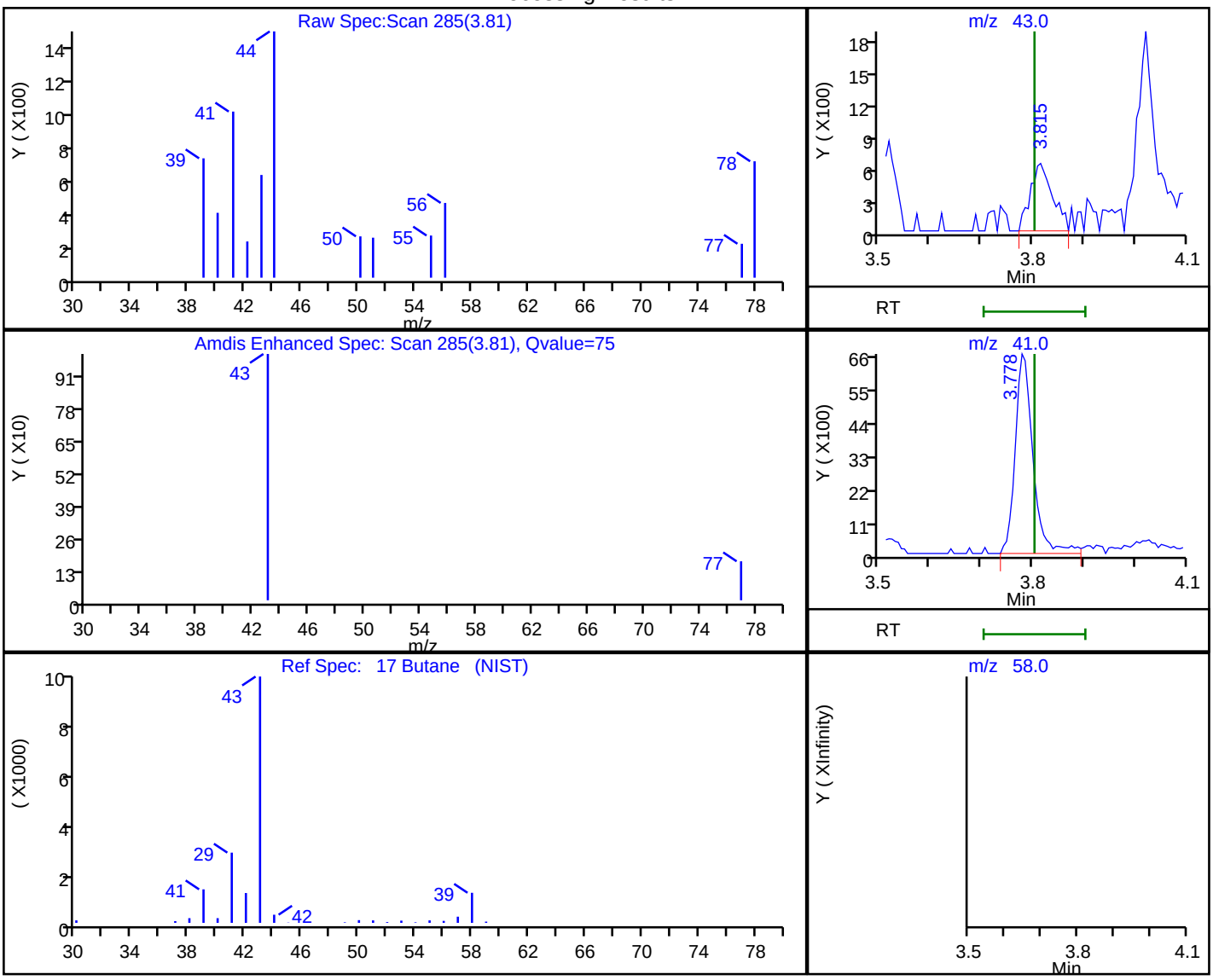
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

17 Butane, CAS: 106-97-8

Processing Results



RT	Mass	Response	Amount
3.81	43.00	1895	0.042563
3.78	41.00	16073	
3.80	58.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:31:51

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

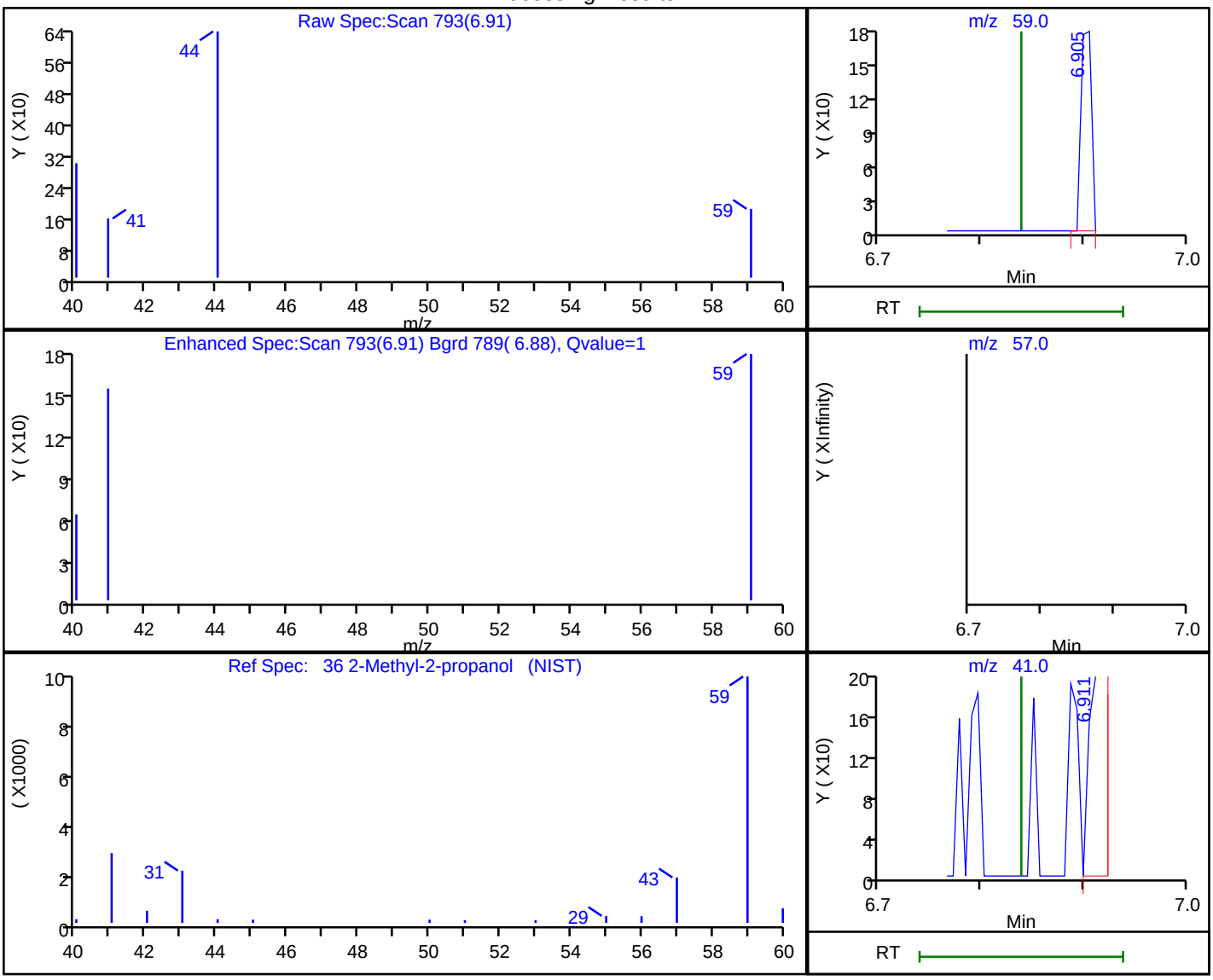
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

36 2-Methyl-2-propanol, CAS: 75-65-0

Processing Results



RT	Mass	Response	Amount
6.91	59.00	129	0.001912
6.84	57.00	0	
6.91	41.00	185	

Reviewer: phanthasena, 28-Jan-2019 13:31:58

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

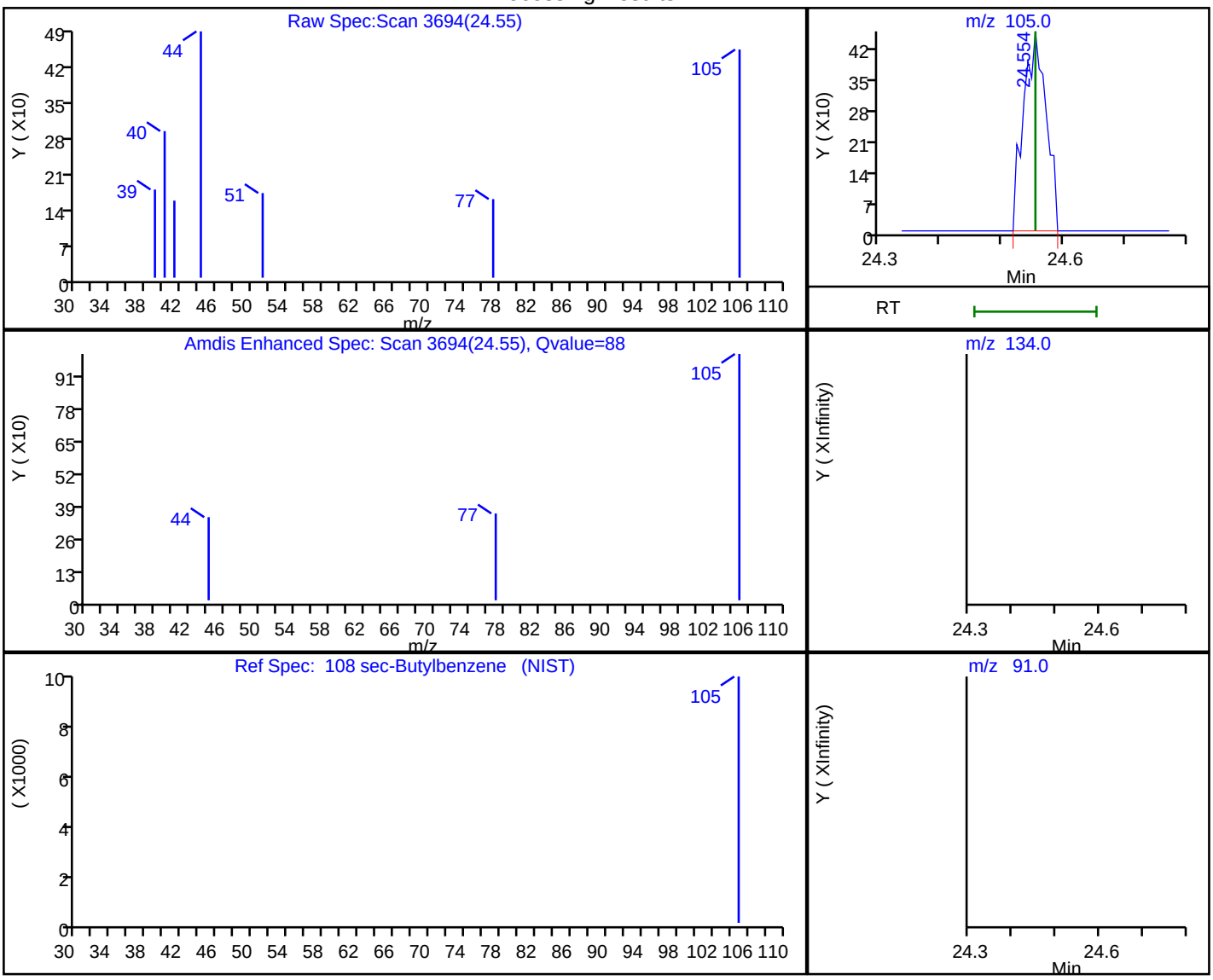
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

108 sec-Butylbenzene, CAS: 135-98-8

Processing Results



RT	Mass	Response	Amount
24.55	105.00	1161	0.005079
24.55	134.00	0	
24.55	91.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:41

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

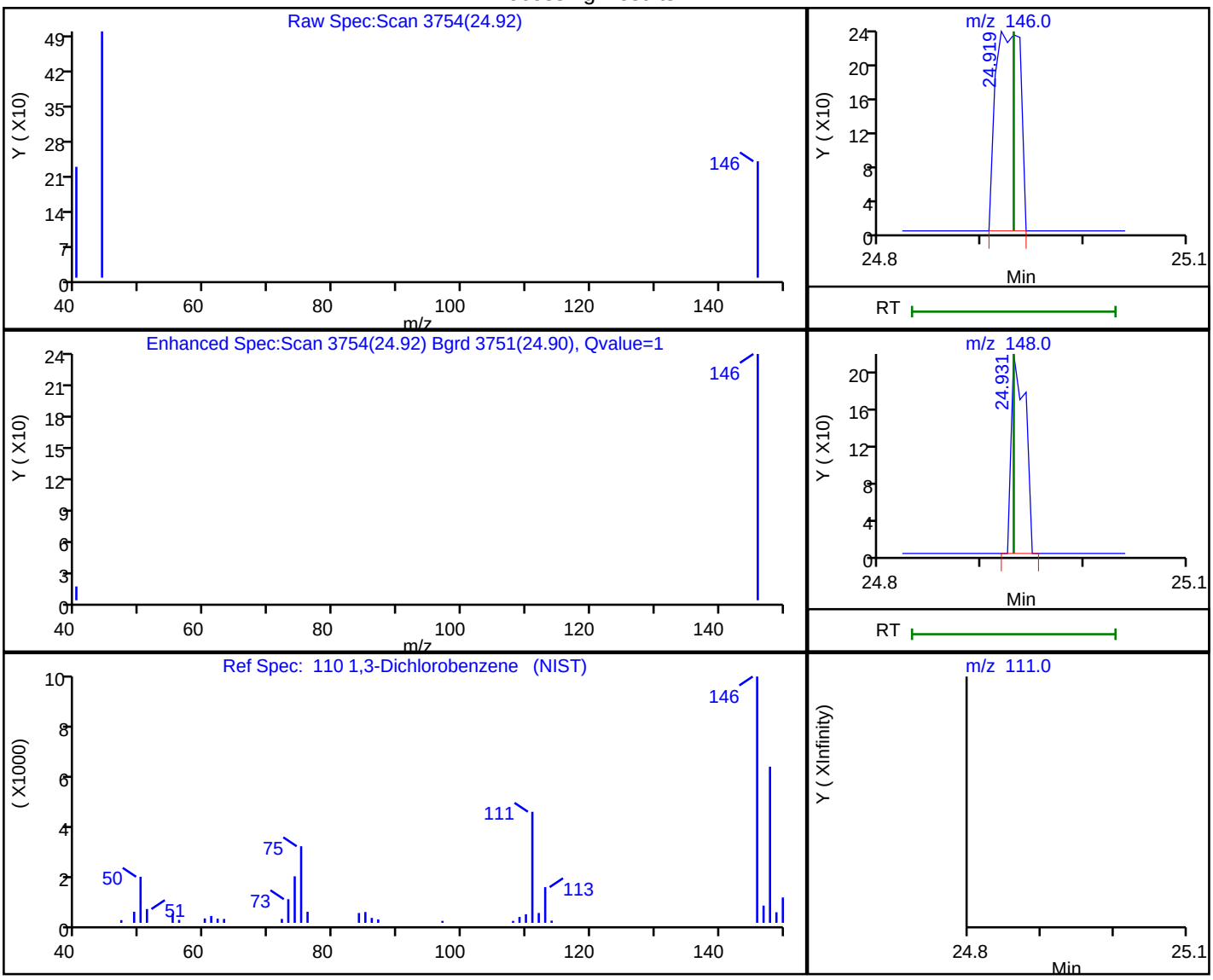
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

110 1,3-Dichlorobenzene, CAS: 541-73-1

Processing Results



RT	Mass	Response	Amount
24.92	146.00	396	0.004278
24.93	148.00	201	
24.93	111.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:44

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

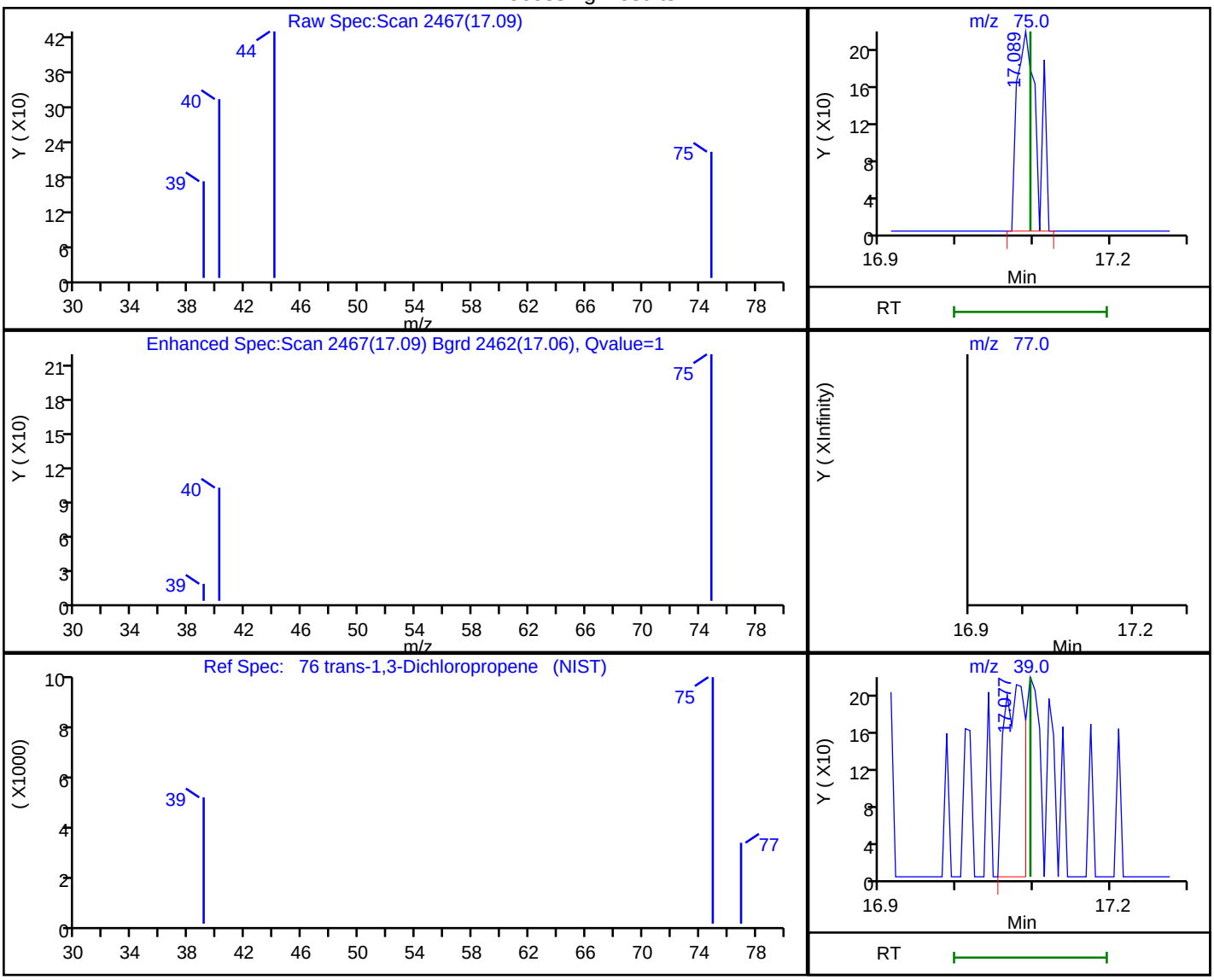
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

76 trans-1,3-Dichloropropene, CAS: 10061-02-6

Processing Results



RT	Mass	Response	Amount
17.09	75.00	398	0.007073
17.10	77.00	0	
17.08	39.00	395	

Reviewer: phanthasena, 28-Jan-2019 13:32:21

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

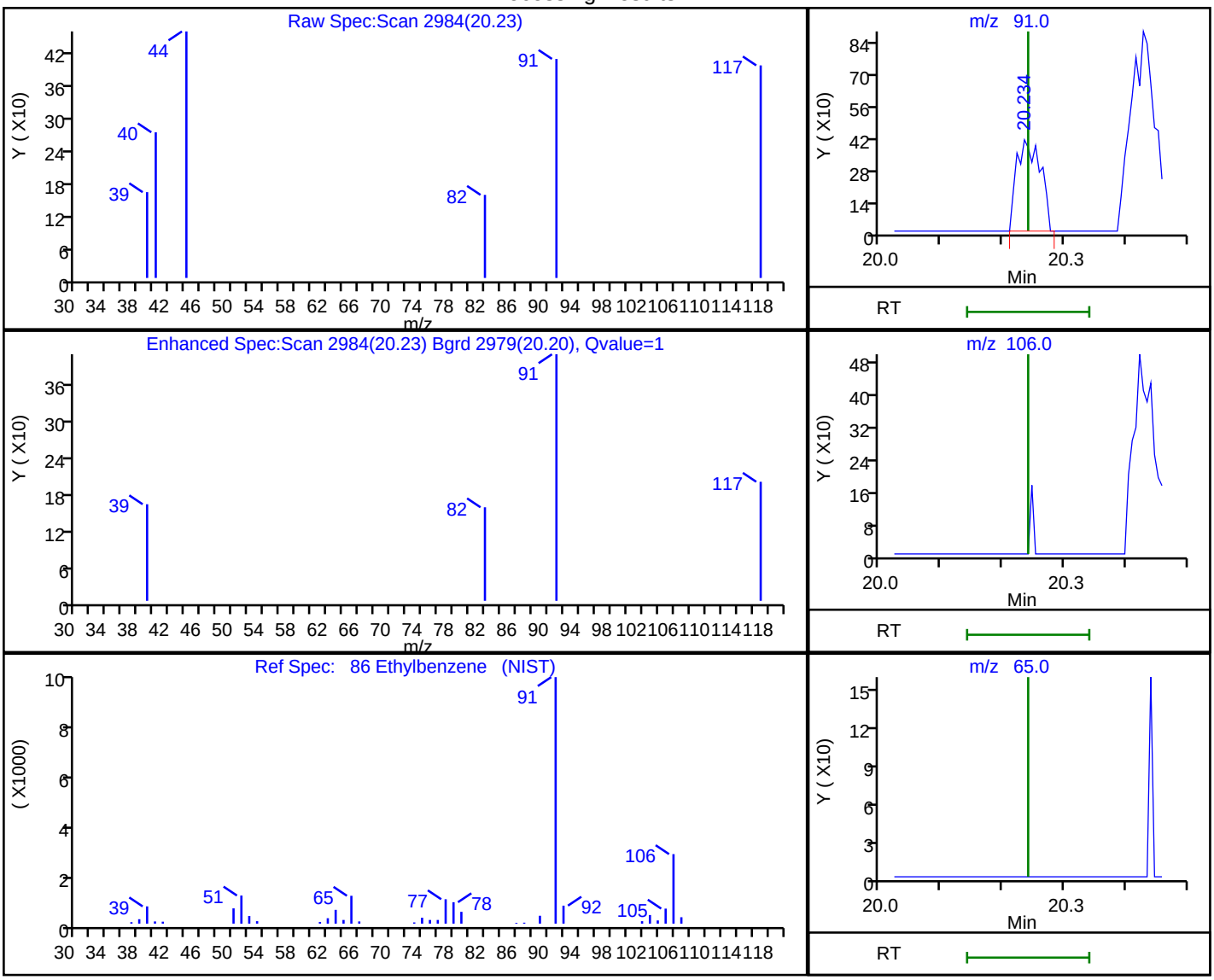
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

86 Ethylbenzene, CAS: 100-41-4

Processing Results



RT	Mass	Response	Amount
20.23	91.00	1092	0.006583
20.24	106.00	0	
20.24	65.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:27

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

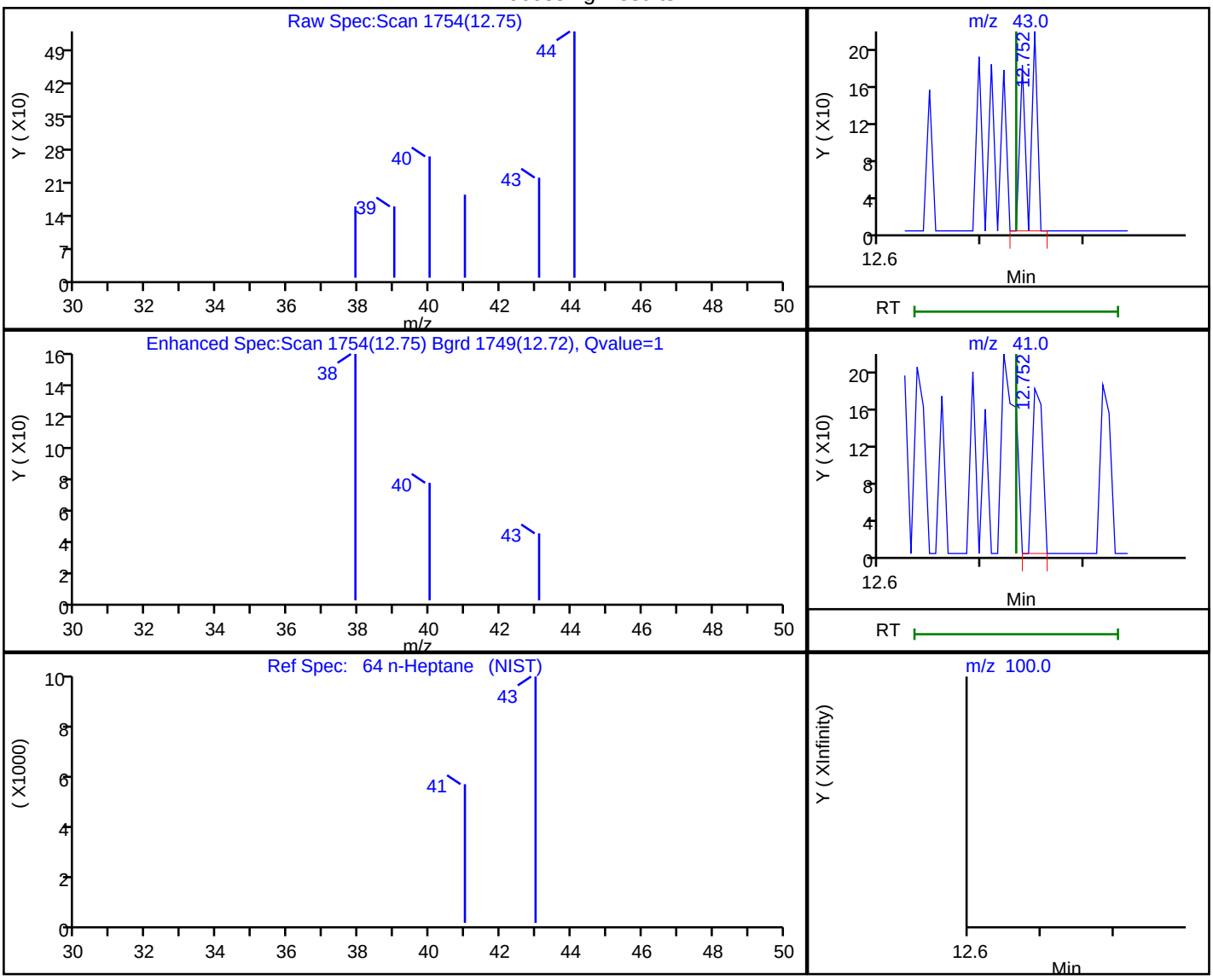
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

64 n-Heptane, CAS: 142-82-5

Processing Results



RT	Mass	Response	Amount
12.75	43.00	142	0.002391
12.75	41.00	122	
12.73	100.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:14

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

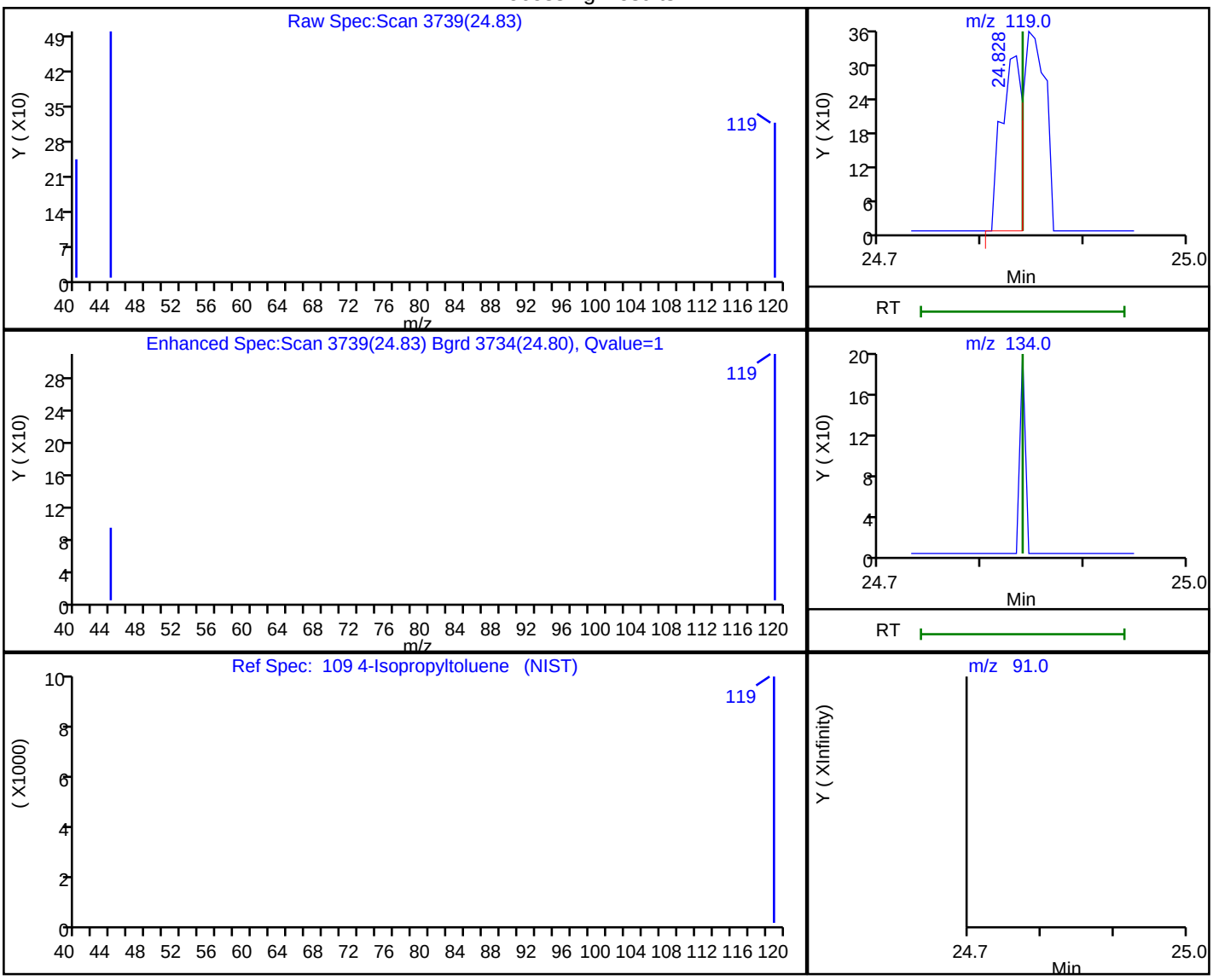
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

109 4-Isopropyltoluene, CAS: 99-87-6

Processing Results



RT	Mass	Response	Amount
24.83	119.00	454	0.002390
24.84	134.00	0	
24.84	91.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:42

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

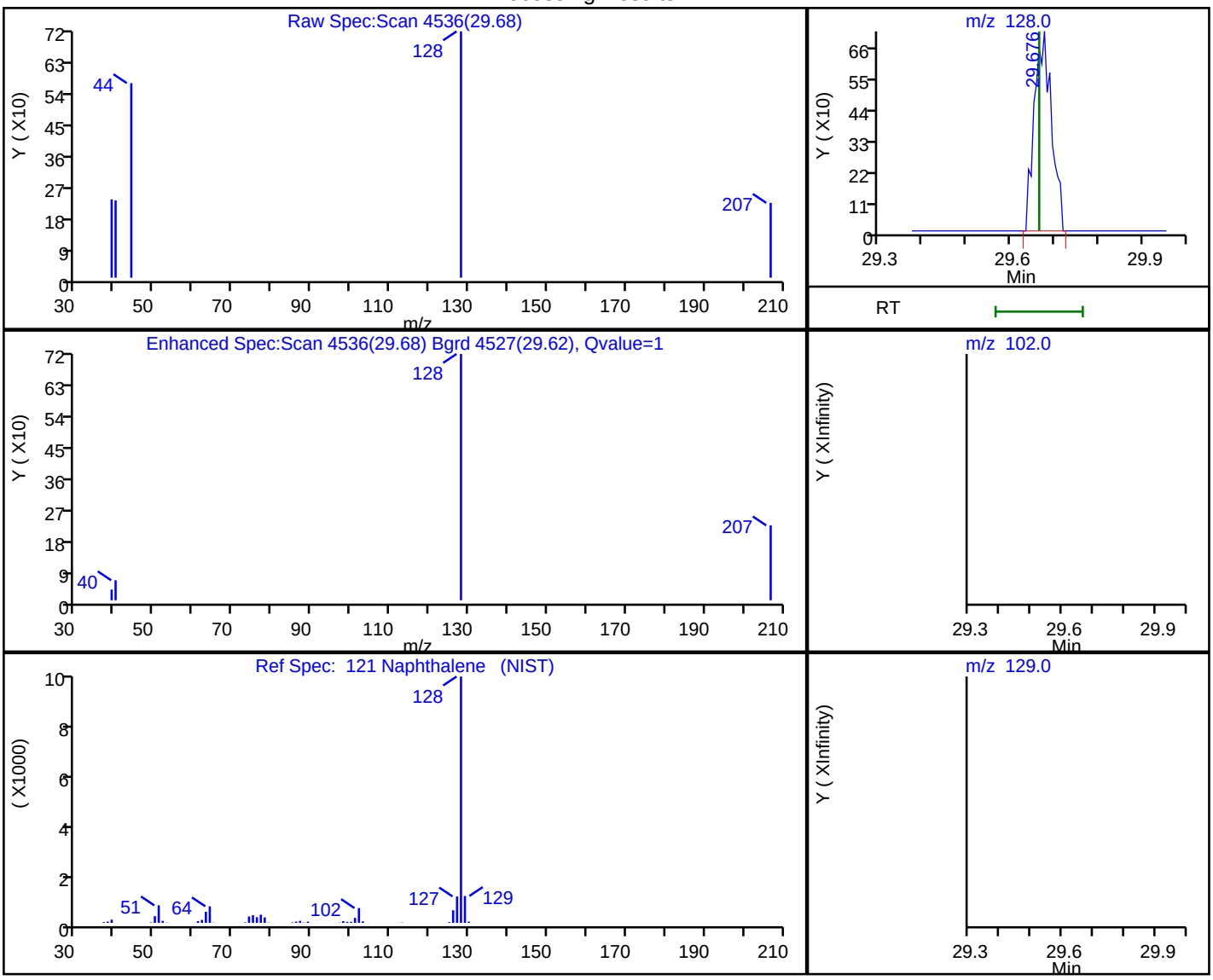
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

121 Naphthalene, CAS: 91-20-3

Processing Results



RT	Mass	Response	Amount
29.68	128.00	1948	0.014440
29.66	102.00	0	
29.66	129.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:50

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

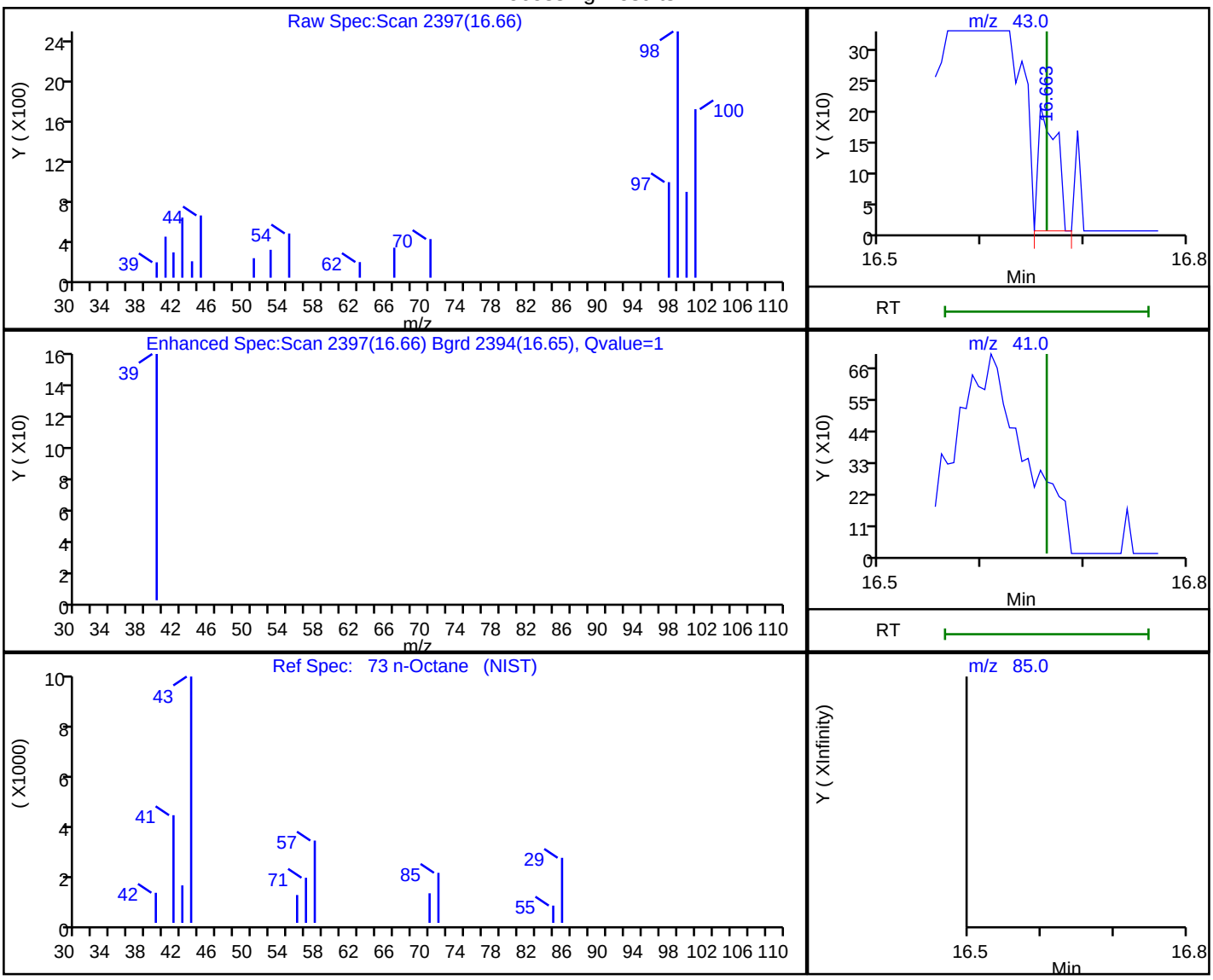
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

73 n-Octane, CAS: 111-65-9

Processing Results



RT	Mass	Response	Amount
16.66	43.00	249	0.002938
16.66	41.00	0	
16.66	85.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:18

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

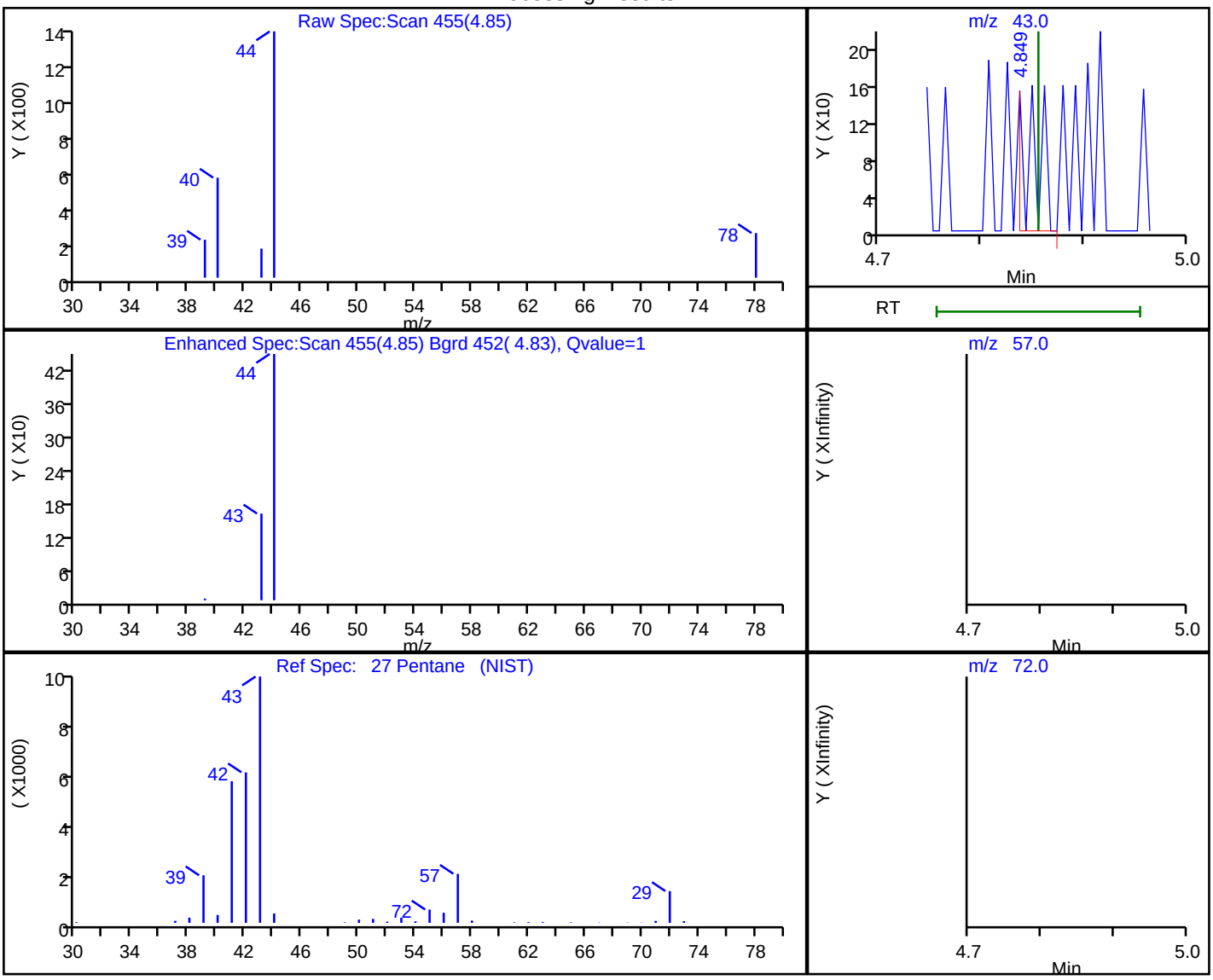
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

27 Pentane, CAS: 109-66-0

Processing Results



RT	Mass	Response	Amount
4.85	43.00	170	0.004994
4.86	57.00	0	
4.86	72.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:31:53

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

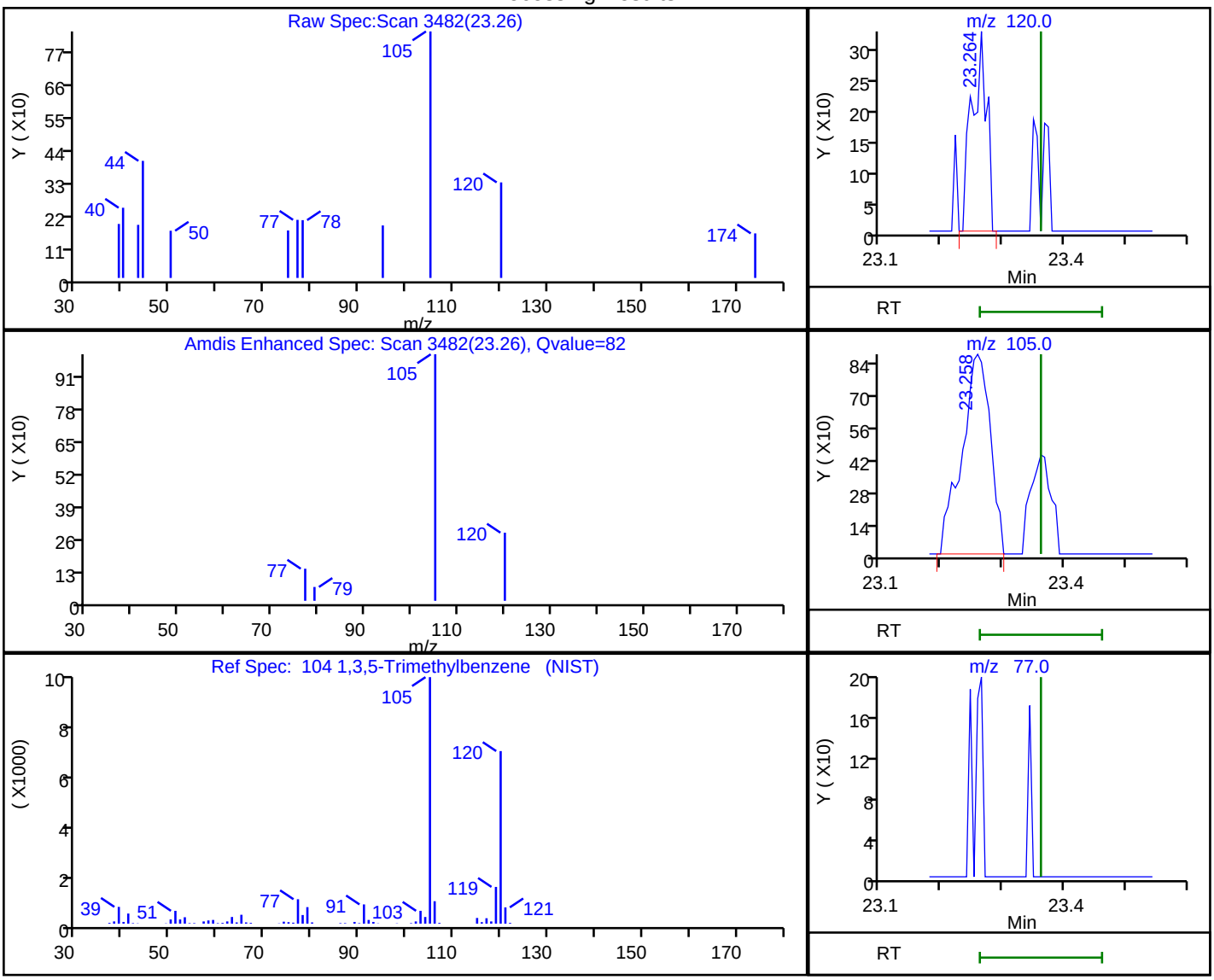
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

104 1,3,5-Trimethylbenzene, CAS: 108-67-8

Processing Results



RT	Mass	Response	Amount
23.26	120.00	539	0.006497
23.26	105.00	2819	
23.36	77.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:37

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

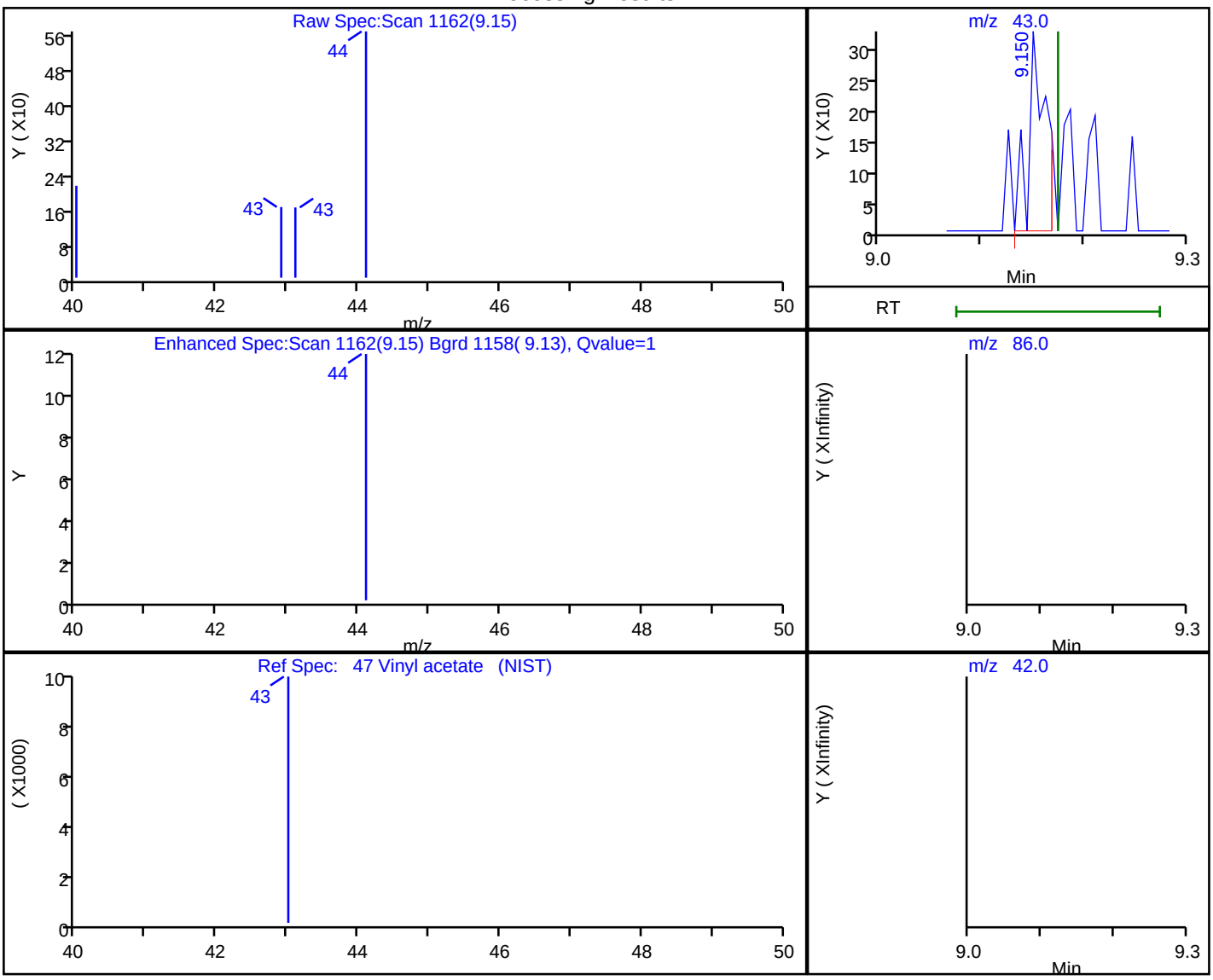
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

47 Vinyl acetate, CAS: 108-05-4

Processing Results



RT	Mass	Response	Amount
9.15	43.00	384	0.004930
9.17	86.00	0	
9.17	42.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:06

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

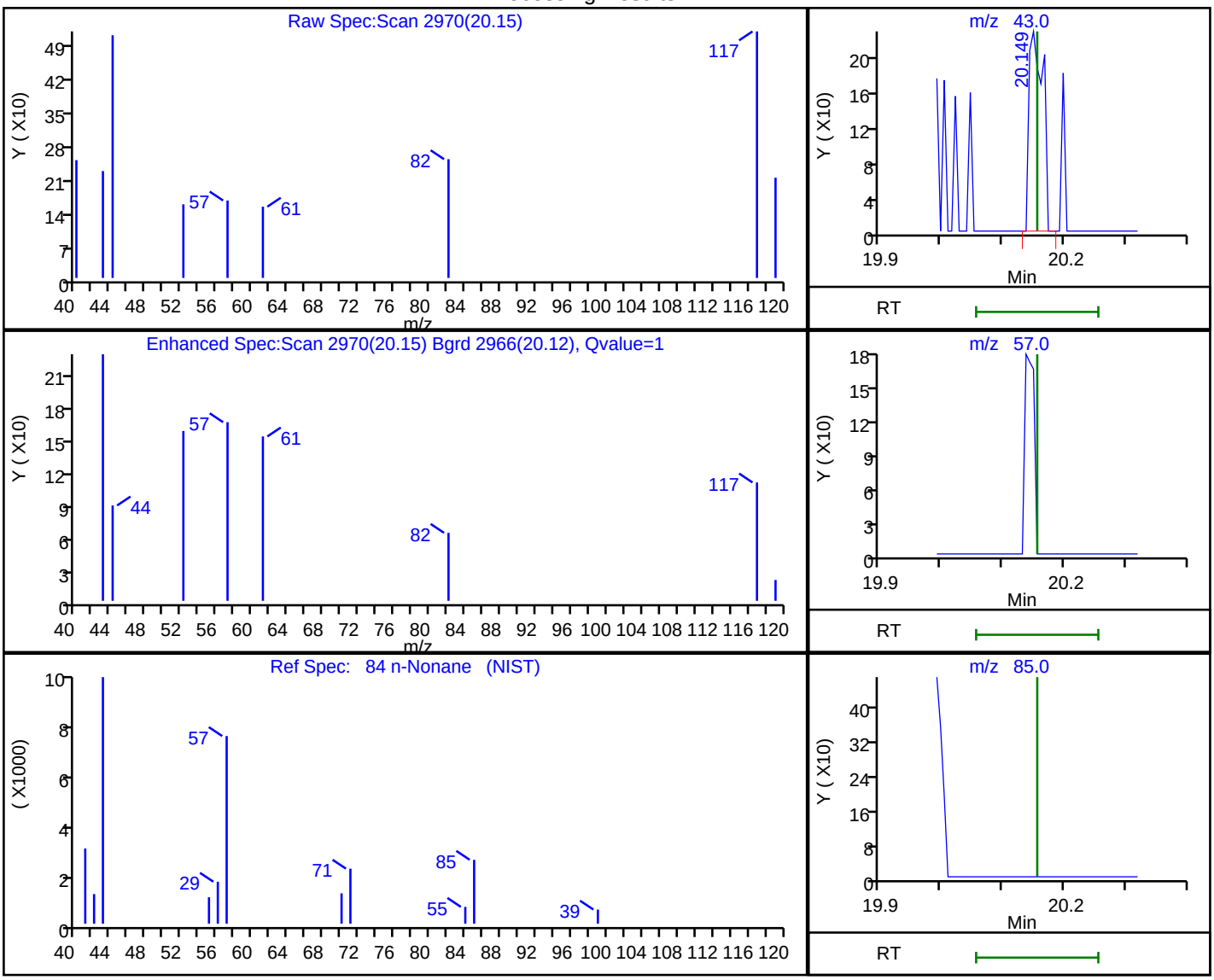
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\chromna\Sacramento\ChromData\ATMS6\20190126-71045.b\MS6012617.D				
Injection Date:	27-Jan-2019 02:01:30	Instrument ID:	ATMS6		
Lims ID:	320-47076-A-1	Lab Sample ID:	320-47076-1		
Client ID:	34000349				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

84 n-Nonane, CAS: 111-84-2

Processing Results



RT	Mass	Response	Amount
20.15	43.00	357	0.004183
20.16	57.00	0	
20.16	85.00	0	

Reviewer: phanthasena, 28-Jan-2019 13:32:25

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-153303-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1
Sampling Event: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
6/18/2018 5:34:12 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-153303-1	EQ Blank	Water	06/05/18 11:10	06/06/18 09:25
490-153303-2	MW-4	Water	06/05/18 11:50	06/06/18 09:25
490-153303-3	MW-8	Water	06/05/18 13:18	06/06/18 09:25
490-153303-4	Dup	Water	06/05/18 00:01	06/06/18 09:25

Job ID: 490-153303-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-153303-1

Comments
No additional comments.

Receipt
The samples were received on 6/6/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

HPLC/IC
Method(s) 300.0: Due to the high concentration of Chloride and Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 490-522302 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-4 (490-153303-2), MW-8 (490-153303-3) and Dup (490-153303-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 06/05/18 11:10
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/15/18 16:32	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 06/05/18 11:50
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	413		50.0		mg/L			06/16/18 17:39	50

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 06/05/18 13:18
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	539		100		mg/L			06/16/18 17:58	100

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 06/05/18 00:01
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	407		50.0		mg/L			06/16/18 18:17	50

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-522302/3
Matrix: Water
Analysis Batch: 522302

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/15/18 14:37	1

Lab Sample ID: LCS 490-522302/4
Matrix: Water
Analysis Batch: 522302

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.463		mg/L		95	90 - 110

Lab Sample ID: LCSD 490-522302/5
Matrix: Water
Analysis Batch: 522302

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.526		mg/L		95	90 - 110	1	20

Lab Sample ID: 490-153359-A-7 MS
Matrix: Water
Analysis Batch: 522302

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1630	E	10.0	1629	E 4	mg/L		-61	80 - 120

Lab Sample ID: 490-153359-A-7 MSD
Matrix: Water
Analysis Batch: 522302

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1630	E	10.0	1636	E 4	mg/L		9	80 - 120	0	20

Lab Sample ID: MB 490-522367/3
Matrix: Water
Analysis Batch: 522367

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/16/18 16:23	1

Lab Sample ID: LCS 490-522367/5
Matrix: Water
Analysis Batch: 522367

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.062		mg/L		91	90 - 110

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 522302

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-153303-1	EQ Blank	Total/NA	Water	300.0	
MB 490-522302/3	Method Blank	Total/NA	Water	300.0	
LCS 490-522302/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-522302/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-153359-A-7 MS	Matrix Spike	Total/NA	Water	300.0	
490-153359-A-7 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 522367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-153303-2	MW-4	Total/NA	Water	300.0	
490-153303-3	MW-8	Total/NA	Water	300.0	
490-153303-4	Dup	Total/NA	Water	300.0	
MB 490-522367/3	Method Blank	Total/NA	Water	300.0	
LCS 490-522367/5	Lab Control Sample	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 06/05/18 11:10
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			522302	06/15/18 16:32	SW1	TAL NSH

Client Sample ID: MW-4
Date Collected: 06/05/18 11:50
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			522367	06/16/18 17:39	JHS	TAL NSH

Client Sample ID: MW-8
Date Collected: 06/05/18 13:18
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		100			522367	06/16/18 17:58	JHS	TAL NSH

Client Sample ID: Dup
Date Collected: 06/05/18 00:01
Date Received: 06/06/18 09:25

Lab Sample ID: 490-153303-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			522367	06/16/18 18:17	JHS	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-153303-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

490-153303 Chain of Custody

COOLER RECEIPT FORM

Cooler Received/Opened On 6/6/2018 @ 0925

Time Samples Removed From Cooler 1722 Time Samples Placed In Storage 1729 (2 Hour Window)

1. Tracking # 6429 (last 4 digits, FedEx) Courier: FedEx

   IR Gun ID 17960358 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 0.5 *Degrees Celsius*

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 (intial) GH

7. Were custody seals on containers: YES NO and Intact YES NO NA

   Were these signed and dated correctly? YES NO NA

8. Packing mat'l used? Bubblewrap 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

13a. Were VOA vials received? YES NO NA

   b. Was there any observable headspace present in any VOA vial? YES NO NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES NO NA If multiple coolers, sequence #

I certify that I unloaded the cooler and answered questions 7-14 (intial) GH

15a. On pres'd 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? YES NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) GH

17. Were custody papers properly filled out (ink, signed, etc)? YES NO NA

18. Did you sign the custody papers in the appropriate place? YES NO NA

19. Were correct containers used for the analysis requested? YES NO NA

20. Was sufficient amount of sample sent in each container? YES NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) GH

I certify that I attached a label with the unique LIMS number to each container (intial) GH

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO #

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 04198

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKH-STM 1Ø1	PROJECT NAME: CHK STATE M	COC 1 of 1
SHIPPED TO: TA-NASHVILLE	PROJECT MANAGER: BRUCE McKENZIE	TAT: STANDARD

SAMPLER'S PRINTED NAME: Terry Fisher

SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
6-5-18	1110	EQ Blank	W	1	X	
6-5-18	1150	MW-4	W	1	X	
6-5-18	1318	MW-8	W	1	X	
6-5-18	—	Dup	W	1	X	

Loc: 490
153303

TOTAL NUMBER OF CONTAINERS → 4

RELINQUISHED BY:	DATE 6-5-18 TIME 1600	RECEIVED BY:	DATE TIME
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FED EX

AIRBILL NUMBER: 4358 5281 6429

RECEIVED IN LABORATORY BY: TA-NAS 0.5°C — DATE 6-6-18 TIME 0925

Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at julie.czech@eccgrp.com

LABORATORY CONTACT: 615-301-5041

LABORATORY ADDRESS: 2960 Foster Creighton Drive Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

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6/18/2018

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-158778-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1
Sampling Event: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
9/19/2018 12:49:35 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-158778-1	EQ Blank	Water	09/05/18 11:43	09/07/18 09:50
490-158778-2	MW-4	Water	09/05/18 12:57	09/07/18 09:50
490-158778-3	MW-8	Water	09/05/18 14:42	09/07/18 09:50
490-158778-4	Dup	Water	09/05/18 00:01	09/07/18 09:50

Job ID: 490-158778-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-158778-1

Comments
No additional comments.

Receipt
The samples were received on 9/7/2018 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-4 (490-158778-2), MW-8 (490-158778-3) and Dup (490-158778-4). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: Due to the nature of the sample matrix, a matrix spike / matrix spike duplicate (MS/MSD) was not analyzed with 490-542864. However, the laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recoveries were within the acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 09/05/18 11:43
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/12/18 15:26	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 09/05/18 12:57
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	387		10.0		mg/L			09/14/18 18:39	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 09/05/18 14:42
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	398		20.0		mg/L			09/14/18 19:53	20

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 09/05/18 00:01
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	388		10.0		mg/L			09/14/18 20:08	10

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-542290/3
Matrix: Water
Analysis Batch: 542290

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/12/18 12:55	1

Lab Sample ID: LCS 490-542290/4
Matrix: Water
Analysis Batch: 542290

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.866		mg/L		99	90 - 110

Lab Sample ID: LCSD 490-542290/5
Matrix: Water
Analysis Batch: 542290

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.784		mg/L		98	90 - 110	1	20

Lab Sample ID: 490-159005-I-1 MS
Matrix: Water
Analysis Batch: 542290

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	8.87		10.0	18.45		mg/L		96	80 - 120

Lab Sample ID: MB 490-542864/3
Matrix: Water
Analysis Batch: 542864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/14/18 16:11	1

Lab Sample ID: LCS 490-542864/4
Matrix: Water
Analysis Batch: 542864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.644		mg/L		96	90 - 110

Lab Sample ID: LCSD 490-542864/5
Matrix: Water
Analysis Batch: 542864

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.642		mg/L		96	90 - 110	0	20

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 542290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-158778-1	EQ Blank	Total/NA	Water	300.0	
MB 490-542290/3	Method Blank	Total/NA	Water	300.0	
LCS 490-542290/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-542290/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-159005-I-1 MS	Matrix Spike	Total/NA	Water	300.0	

Analysis Batch: 542864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-158778-2	MW-4	Total/NA	Water	300.0	
490-158778-3	MW-8	Total/NA	Water	300.0	
490-158778-4	Dup	Total/NA	Water	300.0	
MB 490-542864/3	Method Blank	Total/NA	Water	300.0	
LCS 490-542864/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-542864/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 09/05/18 11:43
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			542290	09/12/18 15:26	SW1	TAL NSH

Client Sample ID: MW-4
Date Collected: 09/05/18 12:57
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			542864	09/14/18 18:39	SW1	TAL NSH

Client Sample ID: MW-8
Date Collected: 09/05/18 14:42
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			542864	09/14/18 19:53	SW1	TAL NSH

Client Sample ID: Dup
Date Collected: 09/05/18 00:01
Date Received: 09/07/18 09:50

Lab Sample ID: 490-158778-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			542864	09/14/18 20:08	SW1	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-158778-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

490-158778 Chain of Custody

COOLER RECEIPT FORM

Cooler Received/Opened On 9/7/2018 @ 9:50

Time Samples Removed From Cooler 1534 Time Samples Placed In Storage 1541 (2 Hour Window)

1. Tracking # 4873 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960358 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 3.3 Degrees Celsius

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 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap 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

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

● ⬅ Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # N/A

I certify that I unloaded the cooler and answered questions 7-14 (intial) AJH

15a. On pres'd 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? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) AJH

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) AJH

I certify that I attached a label with the unique LIMS number to each container (intial) AJH

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 04391

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M	COC 1 of 1	
SHIPPED TO: TA-NASH	PROJECT MANAGER: DAVID BRADY	TAT: STANDARD	

SAMPLER'S PRINTED NAME: TERRY FISHER
SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
9-5-18	1193	EQ Blank	WT	1	X	
9-5-18	1257	MW-4	WT	1	X	
9-5-18	1442	MW-8	WT	1	X	Loc: 490 158778
9-5-18	—	Dup	WT	1	X	

TOTAL NUMBER OF CONTAINERS →	4				
RELINQUISHED BY:	DATE 9-6-18	RECEIVED BY:	DATE		
	TIME 1600		TIME		
RELINQUISHED BY:	DATE	RECEIVED BY: ~~4445 6530 4873~~	DATE		
	TIME		TIME		
METHOD OF SHIPMENT: FEDEX		AIRBILL NUMBER: 4445 6530 4873			
RECEIVED IN LABORATORY BY:	DATE 9/7/18	Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at julie.czech@eccgrp.com			
	TIME 0950				
LABORATORY CONTACT: 615-301-5041	3.5	LABORATORY ADDRESS: 2960 Foster Creighton Dr. Nashville, TN 37204			

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

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9/19/2018

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-165002-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M
Sampling Event: State M

For:
Chesapeake Energy Corporation
PO BOX 548806
Oklahoma City, Oklahoma 73154

Attn: Chase Acker

Cathy Gartner

Authorized for release by:
12/28/2018 11:51:49 AM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-165002-1	MW-4	Water	12/11/18 12:30	12/14/18 10:00
490-165002-2	MW-8	Water	12/11/18 14:10	12/14/18 10:00
490-165002-3	EQ Blank	Water	12/11/18 12:50	12/14/18 10:00
490-165002-4	Dup	Water	12/11/18 00:01	12/14/18 10:00

Job ID: 490-165002-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-165002-1

Comments
No additional comments.

Receipt
The samples were received on 12/14/2018 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

HPLC/IC
Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-4 (490-165002-1), MW-8 (490-165002-2) and Dup (490-165002-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 12/11/18 12:30
Date Received: 12/14/18 10:00

Lab Sample ID: 490-165002-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	373		50.0		mg/L			12/22/18 16:14	50

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 12/11/18 14:10
Date Received: 12/14/18 10:00

Lab Sample ID: 490-165002-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	474		50.0		mg/L			12/22/18 16:47	50

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 12/11/18 12:50
Date Received: 12/14/18 10:00

Lab Sample ID: 490-165002-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/17/18 22:48	1

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 12/11/18 00:01
Date Received: 12/14/18 10:00

Lab Sample ID: 490-165002-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	450		50.0		mg/L			12/22/18 17:20	50

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-564336/3
Matrix: Water
Analysis Batch: 564336

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/17/18 20:52	1

Lab Sample ID: LCS 490-564336/4
Matrix: Water
Analysis Batch: 564336

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.18		mg/L		102	90 - 110

Lab Sample ID: LCSD 490-564336/5
Matrix: Water
Analysis Batch: 564336

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.28		mg/L		103	90 - 110	1	20

Lab Sample ID: 490-164939-L-1 MS
Matrix: Water
Analysis Batch: 564336

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND		10.0	9.839		mg/L		98	80 - 120

Lab Sample ID: MB 490-565641/3
Matrix: Water
Analysis Batch: 565641

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/22/18 15:24	1

Lab Sample ID: LCS 490-565641/4
Matrix: Water
Analysis Batch: 565641

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.995		mg/L		100	90 - 110

Lab Sample ID: LCSD 490-565641/5
Matrix: Water
Analysis Batch: 565641

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.946		mg/L		99	90 - 110	0	20

HPLC/IC

Analysis Batch: 564336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-165002-3	EQ Blank	Total/NA	Water	300.0	
MB 490-564336/3	Method Blank	Total/NA	Water	300.0	
LCS 490-564336/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-564336/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-164939-L-1 MS	Matrix Spike	Total/NA	Water	300.0	

Analysis Batch: 565641

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-165002-1	MW-4	Total/NA	Water	300.0	
490-165002-2	MW-8	Total/NA	Water	300.0	
490-165002-4	Dup	Total/NA	Water	300.0	
MB 490-565641/3	Method Blank	Total/NA	Water	300.0	
LCS 490-565641/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-565641/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Client Sample ID: MW-4

Lab Sample ID: 490-165002-1

Date Collected: 12/11/18 12:30

Matrix: Water

Date Received: 12/14/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			565641	12/22/18 16:14	SW1	TAL NSH

Client Sample ID: MW-8

Lab Sample ID: 490-165002-2

Date Collected: 12/11/18 14:10

Matrix: Water

Date Received: 12/14/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			565641	12/22/18 16:47	SW1	TAL NSH

Client Sample ID: EQ Blank

Lab Sample ID: 490-165002-3

Date Collected: 12/11/18 12:50

Matrix: Water

Date Received: 12/14/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			564336	12/17/18 22:48	SW1	TAL NSH

Client Sample ID: Dup

Lab Sample ID: 490-165002-4

Date Collected: 12/11/18 00:01

Matrix: Water

Date Received: 12/14/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			565641	12/22/18 17:20	SW1	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Chesapeake Energy Corporation
Project/Site: State M

TestAmerica Job ID: 490-165002-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-165002 Chain of Custody

Cooler Received/Opened On 12/14/2018 @ 1000

Time Samples Removed From Cooler 1710 Time Samples Placed In Storage 1731 (2 Hour Window)

1. Tracking # 7064 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17610176 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 1.1 Degrees Celsius

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) 1 (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 (intial) 2-2

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap 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

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

● ⬅ Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) [signature]

15a. On pres'd 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? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) [signature]

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) [signature]

I certify that I attached a label with the unique LIMS number to each container (intial) [signature]

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 1023

EQUUS environmental solutions

PROJECT NUMBER: CHKSTATM: H18001	PROJECT NAME: CHK STATE M	COC 1 of 2
SHIPPED TO: TA - Nashville	PROJECT MANAGER: David Brady	TAT:

SAMPLER'S PRINTED NAME: TERRY FISHER

SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	Chloride
12-11-18	1230	MW-4	WATER	1	X
12-11-18	1410	MW-8	water	1	X
12-11-18	1250	EQ Blank	water	1	X
12-11-18	—	Dup	water	1	X

ASOW:

REMARKS

Loc: 490
165002

TOTAL NUMBER OF CONTAINERS → 4

RELINQUISHED BY:	DATE 12-13-18	RECEIVED BY:	DATE
	TIME 1600		TIME
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

METHOD OF SHIPMENT:

AIRBILL NUMBER: 4445 6535 7064

RECEIVED IN LABORATORY BY:	DATE 12/14/18
	TIME 1000

Send PDF, EDD, and INVOICE (if applicable) to:

LABORATORY CONTACT:

LABORATORY ADDRESS:

POINT OF ORIGIN:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-169820-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1
Sampling Event: State M

For:
Chesapeake Energy Corporation
PO BOX 548806
Oklahoma City, Oklahoma 73154

Attn: Chase Acker

Cathy Gartner

Authorized for release by:
3/21/2019 5:15:03 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-169820-1	MW-4	Water	03/06/19 12:15	03/08/19 09:00
490-169820-2	MW-8	Water	03/06/19 14:40	03/08/19 09:00
490-169820-3	Dup	Water	03/06/19 00:01	03/08/19 09:00
490-169820-4	EQ Blank	Water	03/06/19 00:01	03/08/19 09:00

Case Narrative

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Job ID: 490-169820-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-169820-1

Comments
No additional comments.

Receipt
The samples were received on 3/8/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3º C.

HPLC/IC
Method(s) 300.0: The matrix spike (MS) results for 490-581498 exceeded the calibration curve limit for chloride and/or Sulfate. (490-169663-I-1 MS)

Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-4 (490-169820-1), MW-8 (490-169820-2), and Dup (490-169820-3). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-581932 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
E	Result exceeded calibration range.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 03/06/19 12:15
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	617		50.0		mg/L			03/20/19 04:55	50

Client Sample Results

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 03/06/19 14:40
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	308		100		mg/L			03/21/19 12:58	100

Client Sample Results

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Client Sample ID: Dup

Date Collected: 03/06/19 00:01
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-3

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	349		50.0		mg/L			03/20/19 05:28	50

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 03/06/19 00:01
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/19/19 00:48	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-581498/3
Matrix: Water
Analysis Batch: 581498

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/18/19 17:37	1

Lab Sample ID: LCS 490-581498/4
Matrix: Water
Analysis Batch: 581498

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.823		mg/L		98	90 - 110

Lab Sample ID: LCSD 490-581498/5
Matrix: Water
Analysis Batch: 581498

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.782		mg/L		98	90 - 110	0	20

Lab Sample ID: 490-169663-I-1 MS
Matrix: Water
Analysis Batch: 581498

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	35.5	E	10.0	47.18	E	mg/L		117	80 - 120

Lab Sample ID: MB 490-581932/3
Matrix: Water
Analysis Batch: 581932

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/19/19 23:57	1

Lab Sample ID: LCS 490-581932/4
Matrix: Water
Analysis Batch: 581932

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.730		mg/L		97	90 - 110

Lab Sample ID: LCSD 490-581932/5
Matrix: Water
Analysis Batch: 581932

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.650		mg/L		96	90 - 110	1	20

Lab Sample ID: 490-169663-I-1 MS
Matrix: Water
Analysis Batch: 581932

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	35.1	E F1	10.0	47.76	E F1	mg/L		127	80 - 120

QC Sample Results

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Lab Sample ID: 490-169663-I-1 MSD
Matrix: Water
Analysis Batch: 581932

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	35.1	E F1	10.0	47.42	E F1	mg/L		123	80 - 120	1	20

Lab Sample ID: MB 490-582474/3
Matrix: Water
Analysis Batch: 582474

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/21/19 08:00	1

Lab Sample ID: LCS 490-582474/10
Matrix: Water
Analysis Batch: 582474

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.720		mg/L		97	90 - 110

Lab Sample ID: LCSD 490-582474/11
Matrix: Water
Analysis Batch: 582474

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.954		mg/L		99	90 - 110	2	20

Lab Sample ID: 490-170505-A-1 MS
Matrix: Water
Analysis Batch: 582474

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.08		10.0	12.11		mg/L		100	80 - 120

Lab Sample ID: 490-170505-A-1 MSD
Matrix: Water
Analysis Batch: 582474

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.08		10.0	12.14		mg/L		101	80 - 120	0	20

HPLC/IC

Analysis Batch: 581498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-169820-4	EQ Blank	Total/NA	Water	300.0	
MB 490-581498/3	Method Blank	Total/NA	Water	300.0	
LCS 490-581498/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-581498/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-169663-I-1 MS	Matrix Spike	Total/NA	Water	300.0	

Analysis Batch: 581932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-169820-1	MW-4	Total/NA	Water	300.0	
490-169820-3	Dup	Total/NA	Water	300.0	
MB 490-581932/3	Method Blank	Total/NA	Water	300.0	
LCS 490-581932/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-581932/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-169663-I-1 MS	Matrix Spike	Total/NA	Water	300.0	
490-169663-I-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 582474

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-169820-2	MW-8	Total/NA	Water	300.0	
MB 490-582474/3	Method Blank	Total/NA	Water	300.0	
LCS 490-582474/10	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-582474/11	Lab Control Sample Dup	Total/NA	Water	300.0	
490-170505-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
490-170505-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Lab Chronicle

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 03/06/19 12:15
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			581932	03/20/19 04:55	JHS	TAL NSH

Client Sample ID: MW-8
Date Collected: 03/06/19 14:40
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		100			582474	03/21/19 12:58	JHS	TAL NSH

Client Sample ID: Dup
Date Collected: 03/06/19 00:01
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			581932	03/20/19 05:28	JHS	TAL NSH

Client Sample ID: EQ Blank
Date Collected: 03/06/19 00:01
Date Received: 03/08/19 09:00

Lab Sample ID: 490-169820-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			581498	03/19/19 00:48	SW1	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Chesapeake Energy Corporation
Project/Site: State M-1

TestAmerica Job ID: 490-169820-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

490-169820 Chain of Custody

COOLER RECEIPT FORM

490503

Cooler Received/Opened On 3/8/2019 @ 9:00

Time Samples Removed From Cooler 14:57 Time Samples Placed In Storage 15:04 (2 Hour Window)

1. Tracking # 0783 (last 4 digits, FedEx) Courier: Fedex

IR Gun ID 31470366 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 3.3 *Degrees Celsius*

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 (intial) ACE

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap 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

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

● ⬅ Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) ACE

15a. On pres'd 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? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) ACE

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) ACE

I certify that I attached a label with the unique LIMS number to each container (intial) ACE

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 1050

EQUUS environmental solutions

PROJECT NUMBER: CHKSTATMH18001	PROJECT NAME: CHK STATE M	COC ____ of ____	
SHIPPED TO: TA-NASHVILLE	PROJECT MANAGER: DAVID BRADY	TAT: STANDARD	

SAMPLER'S PRINTED NAME: TERRY FISHER

SAMPLER'S SIGNATURE: Terry Fisher

ASOW: N/A

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
3/6/19	1215	MW-4	W	1	X	
3/6/19	1440	MW-8	W	1	X	
3/6/19	—	Dup	W	1	X	
3/6/19	—	EQ Blank	W	1	X	

Loc: 490
169820

TOTAL NUMBER OF CONTAINERS → 4

RELINQUISHED BY: Terry Fisher	DATE 3-7-19 TIME 1400	RECEIVED BY:	DATE TIME
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FEDEX

AIRBILL NUMBER: 8137 2219 0383

RECEIVED IN LABORATORY BY: 3.5° DATE 3/8/19 TIME 9:00

Send PDF, EDD, and INVOICE (if applicable) to: QAQC@EQUUSENV.COM

LABORATORY ~~CONTACT~~: 615-301-5041

LABORATORY ADDRESS: 2960 FOSTER CREIGHTON DRIVE NASHVILLE, TN 37204

POINT OF ORIGIN: