Mr. Shawn Tisdell
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Fairbanks, Alaska 99709

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Subject:
First & Second Quarter 2019 Remediation System Operations and Maintenance Report
Chevron Facility 306456
328 ½ Illinois Street
Fairbanks, Alaska
ADEC File Number: 102.38.004

ENVIRONMENT

Date:
August 15, 2019

Contact:
Nicole Monroe

Phone:
503.785.9414

Email:
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Our ref:
30010560

Dear Mr. Tisdell:

On behalf of Chevron Environmental Management Company (EMC), Arcadis U.S., Incorporated (Arcadis) is submitting this Second Quarter 2019 Remediation System Operations and Maintenance (O&M) Report for the former Chevron facility 306456 located at 328 ½ Illinois Street, in Fairbanks, Alaska (the site). The site location and surrounding area are shown on Figure 1. Remediation equipment associated with the site consists of an air sparge (AS) and soil vapor extraction (SVE) system.

As proposed in Cleanup Action Plan (CAP) submitted to the ADEC, the system was shut down and winterized on October 26, 2018 (Arcadis 2014). The system was restarted on April 18, 2019 for continuous operation during the warmer months. This O&M report summarizes the monitoring activities of the AS/SVE system since startup in April 2019 and presents the quarterly SVE effluent sampling results for system operation until June 2019.

SITE HISTORY

The 3.11-acre site is located at 328 ½ Illinois Street in Fairbanks, Alaska (Figure 1). Unocal used the western 1.84 acres of the site to store and dispense fuel between 1952 and 1982, and added the westernmost 1.27 acres to the lease in 1961. Former fuel facilities included two 55,000-gallon and nine 20,000-gallon

aboveground storage tanks (ASTs), underground pipelines, pumping facilities, loading docks, and fuel dispensing pumps located in the southern and south-central areas of the site. Diesel fuel and aviation gas were stored on site.

The Alaska Railroad Corporation (ARRC) leased the westernmost 1.27 acres of the site from 1941 to 1981. The entire site was leased by Interior Leasing from 1982 to 1989 and by CEM Leasing from 1989 to 2001. Petroleum Sales operated the facility from 1982 to 2001. According to the Subsurface Site Investigation – Phase II (GeoEngineers Inc. 2003), and Mr. Phil Tannehill, co-owner of Petroleum Sales, the ASTs were removed in 1993, and the piping and dispensing pumps were removed in 1997.

The site location and surrounding features are depicted on an aerial photograph included on Figure 2. Surrounding properties include the former Chevron Facility (#1001430) to the north, former Texaco Facility (#211815) to the northwest, and the Alaska Communication Systems Property to the west. Site features are presented on Figure 2.

REMEDIATION SYSTEM BACKGROUND

As proposed in the CAP, Alternative 2, an AS/SVE system was installed at the site to address onsite petroleum hydrocarbon related impacts to soil and groundwater stemming from historical site operations (Arcadis 2014). Included as part of Alternative 2 were two limited surface soil excavations. Installation activities were split into two phases; Phase 1 was completed in 2014 and Phase 2 was completed in 2015. Phase 1 included utility clearance, borehole and trench clearance, drilling, temporary completion of 14 AS wells and one SVE well, two shallow excavations, and site surveying. Phase 2 included baseline groundwater sampling, permitting, vacuum clearance activities, removal and transport of AS/SVE system from Chevron Facility 92114, trenching and piping activities, well head completion, aboveground system installation, start-up and testing. Details of system installation activities will be submitted under a separate cover.

Existing monitoring wells, GEI-1, GEI-2, GEI-7, GEI-11, and GEI-12 were converted to SVE wells during system construction in 2015. These wells are constructed of 2-inch diameter schedule 40 polyvinyl chloride (PVC) and extend approximately 20-feet below ground surface (bgs), and screened from 10 to 20 feet bgs with 0.020-inch screen. One additional SVE well was installed, SVE-1, and was constructed of 4-inch diameter schedule 40 polyvinyl chloride (PVC) and installed to a depth of 17 feet bgs. SVE-1 is screened from 7 to 17 feet bgs with 0.020 inch screen. Heat trace has been installed inside the conveyance piping from the treatment system down the length of the well. Heat trace was installed one foot below the maximum depth-to-water (DGW) measurement observed in the area based on historical data.

Fourteen AS wells (AS-1 to AS-14) were installed and constructed out of 2-inch diameter schedule 80 PVC, with 2-feet of 0.020-inch slot schedule 80 PVC above a 2-feet sump at the bottom of the well. Depths of AS wells ranged from approximately 28 to 31-feet bgs. Two to three AS wells were installed near each compliance well. The following lists the AS wells for each operating group:

- Group 1: AS-1, AS-2

- Group 2: AS-3, AS-4, AS-5
- Group 3: AS-6, AS-7, AS-8
- Group 4: AS-9, AS-10, AS-11
- Group 5: AS-12, AS-13, AS-14

Well locations, pipe layout and site details are shown on Figure 3. Based on mounding test results, system data indicated that the optimum operational period for sparging on individual wells is approximately one hour. Mounding test details will be submitted under a separate cover.

METHODS

Work associated with this O&M report was conducted under the direction of a "qualified person" as defined in ADEC documentation 18 Alaska Administrative Code (AAC) 75.990 (100) and 18 AAC 78.995 (118). Scheduled O&M activities were conducted on a monthly basis during the reporting period. Once a quarter during system operation, soil vapor effluent samples were collected from the effluent stack using SUMMA™ canisters. SUMMA™ canister vacuum readings were recorded before and after sampling. Effluent vapor samples were collected during the second quarter on April 18 and May 24, 2019. The samples were submitted to Eurofins Lancaster Laboratories (Lancaster) of Lancaster, Pennsylvania for the following chemical analyses:

- GRO by Environmental Protection Agency (EPA) method 25 modified
- BTEX by EPA method 18 modified

To assess remediation system performance, the SVE effluent air flow rate was reported based on output from a flow indicator installed in the effluent header pipe; measurements are displayed on the human-machine interface (HMI) screen on the control panel (located in control room).

Organic vapor concentrations were measured at the effluent stack by a calibrated photoionization detector (PID) during monthly O&M field events for comparison with laboratory data.

GRO recovery rates were calculated based on the SVE system flow rate, the total operational time of the system, and the GRO concentrations detected in effluent samples submitted to Lancaster. If laboratory analysis did not detect concentrations above the laboratory detection limit in the sample, one half the laboratory detection limit was used in the calculation. Net GRO mass recovery is tracked to determine the cumulative mass of GRO removed from the subsurface since system startup.

REMEDIATION SYSTEM OPERATION AND PERFORMANCE RESULTS

In the first half of 2019, the AS/SVE system operated from April 18 to June 19, 2019 was operational for 83% of the reporting period. The total number of hours of operation since the initial system startup on September 10, 2015 is 10,788 hours. The system was restarted during the April 18, 2019 monthly O&M readings collection. The system was shut down from May 20 to 22, 2019 for the First Semiannual Groundwater Monitoring event. The system was shutdown prior to the monitoring event to allow the subsurface to equilibrate and restarted at the end of sampling.

During the first half of 2019 operating period, the system injection pressure averaged 10.5 pounds per square inch (psi), based on pressure recorded at the heat exchanger inlet. Flow rates in individual sparge wells ranged from 6 cubic feet per minute (cfm) to 20 cfm. Air sparge system operational data are summarized in Tables 1 and 2 and O&M system operational data sheets and field notes are included in Appendix A.

Each arm of the SVE manifold is equipped with vacuum gauge, Dwyer® Flow Sensor (with magnehelic gauge), and sample port. During each site visit, readings are recorded from this instrumentation. PID, lower explosion limit (LEL), and oxygen measurements are taken from the sample port using portable vacuum pump and RKI Eagle multi-gas meter. Field staff cycle through each AS group, and vapor readings are collected from each arm of the manifold.

Table 3 presents readings collected from the SVE manifold; vapor gas readings reported in this table were taken when the AS group in the vicinity was operating unless otherwise noted. The table below summarizes the range of vacuum, PID, and flow rate readings from each SVE well during continuous operation. There was no flow observed in well GEI-11 during the April site visit which was likely due to ice in the well.

SVE Well ID	PID readings (ppmv)	Manifold Vacuum (in w.c.)	Flow (scfm)
GEI-2	48 to 160	8 to 15	33 to 163
GEI-11	69 to 90	8 to 11	0 to 163
SVE-1	82 to 133	6 to 9	40 to 155
GEI-7	8 to 37	5 to 9	46 to 155
GEI-1	5 to 22	10 to 14	32 to 163

SVE EFFLUENT ANALYTICAL RESULTS

The effluent air samples collected with SUMMA™ canisters from the SVE effluent stack on April 18, 2019 and May 24, 2019 were submitted for laboratory analysis. (At minimum, quarterly sampling is required.)

During the April 2019 sampling event, the concentrations of toluene, total xylenes, and GRO were 6 parts per million by volume (ppmv), 6 ppmv, and 230 ppmv, respectively. Benzene was detected at an estimated concentration of 2 ppmv. Ethylbenzene was not detected above the laboratory detection limit.

The concentrations of benzene, toluene, ethylbenzene, and total xylenes in May 2019 were non-detect or below the laboratory detected limit with the exception of GRO which was detected at 140 ppmv.

Individual SVE well data including GRO removal rates as well as SVE effluent analytical results and PID readings are summarized in Table 4. SVE effluent PID readings to date are shown on Figure 4. O&M datasheets and field notes documenting April, May, and June monitoring activities are included as Appendix A. Laboratory reports, chains-of-custody and ADEC data review checklists are included as Appendix B. An electronic copy of laboratory data packages is included with this report on the enclosed compact disc.

During operation in the first half of 2019, the overall SVE system flow rate ranged from approximately 160 to 185 standard cubic feet per minute (scfm), and the average SVE effluent flow rate was 174 scfm. The system vacuum ranged from 1 to 32 inches of water column (in w.c.), with an average vacuum of 16 in w.c.

System flow rates and laboratory analytical effluent data were used to calculate mass removal rates and total mass removed. During continuous operation, the mass recovery rate in the first half of 2019 ranged from approximately 7.9 to 11.74 pounds per day (lbs/day), and the average rate was approximately 9.3 lbs/day. The mass removed during this period was approximately 419 pounds (lbs); cumulative mass removed since system startup, including system testing in August 2015, was approximately 6,089 lbs. Cumulative GRO mass removal and mass removal rate is illustrated on Figure 5.

LABORATORY DATA QUALITY ASSURANCE SUMMARY

As required by ADEC (Technical Memorandum, March 2009), Arcadis completed laboratory data review checklists for the Eurofins laboratory reports from the April, May, and June 2019 O&M events. The following quality assurance (QA) summary describes six parameters, related to the quality and usability of the data presented in this report.

1. Precision - Based on the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) relative percent differences, the data meet precision objectives.
2. Accuracy - The data meet accuracy objectives as indicated by the laboratory quality control samples, which were within method/laboratory limits.
3. Representativeness - The data appear to be representative of site conditions and are generally consistent with expected effluent results.
4. Comparability – Results are comparable to previous laboratory methods, reported units, and analytical results.
5. Completeness - The results appear to be valid and usable, and thus, the laboratory results have 100% completeness.
6. Sensitivity - The sensitivity of the analyses was adequate for the samples.

SUMMARY AND CONCLUSIONS

The system was restarted on April 18, 2019 following winterization shutdown that was completed on October 26, 2018. System flow rates and laboratory analytical effluent data were used to calculate mass removal rates and total mass removed. During continuous operation in the first half of 2019, the average mass recovery rate was approximately 9.3 lbs/day. The mass removed during this period was approximately 419 lbs; cumulative mass removed since system startup, was approximately 6,089 lbs.

The AS/SVE system was operational for approximately 82% of the planned operational period since startup on April 18, 2019 to the June 19, 2019 monthly site visit.

If you have any questions or require additional information, please contact Nicole Monroe at 503.785.9414.

Sincerely,

Arcadis U.S., Inc.

Arti Patel, P.E. – WA
Environmental Engineer

Nicole Monroe, P.E. - OR
Project Manager

Copies:
Mr. Tim Bishop, Chevron EMC,
Mr. Russell Grandel, ARRC, Anchorage, Alaska
Mr. Mervin Gilbertson, Big State Logistics, Fairbanks, Alaska

References

GeoEngineers Inc. 2003. Subsurface Site Investigation – Phase II. Former Unocal Bulk Plant 306456. October 31.

Arcadis. 2014. Cleanup Plan, Former Unocal #306456, Fairbanks, Alaska. January 15.

Enclosures:

Tables

1 Air Sparge Header Data

2 Air Sparge Well Data

3 Soil Vapor Extraction Manifold Data

4 Air Sparge/Soil Vapor Extraction Analytical Data and Mass Recovery

Figures

Appendices

TABLES

TABLE 1 - Air Sparge Header Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

Date and Time	AS "on" upon arrival?	Compressor Hour Meter (hours)	System Differential Pressure (in w.c.)[1]	System Flow Rate (scfm)[1]	Heat Exchanger Inlet T (deg F)	Heat Exchanger Outlet T (deg F)	Compressor Discharge Pressure - before heat exchanger (psi)	Compressor Discharge Pressure - after heat exchanger (psi)
8/15/2015 7:00	No - System testing	33	NR	NC	175.00	82.00	5.5	10.50
8/16/2015 12:50	Yes	53	NR	NC	15.00	77.00	0	3.00
8/17/2015 2:20	Compressor off, Heat Exchanger On	71	0.40	26.0	81.00	0.00	NR	6.00
9/10/2015 19:05	AS System off	257	0.20	14.3	146.00	80.00	4.00	0.00
10/2/2015 12:30	AS System off	703	0.60	30.5	140.00	54.00	5.00	6.50
11/10/2015 10:30	AS System off - winterization	1414	NR	NC	125.00	36.00	5.50	5.00
4/15/2016 14:30	No - System restart	1420	0.10	13.8	150.00	64.00	13.00	12.00
5/10/2016 10:30	Yes	1904	0.10	12.7	160.00	78.00	13.00	8.50
5/23/2016 10:30	No - System restart after GWM (05/20/16)	2167	0.40	24.3	148.00	65.00	10.00	6.00
6/16/2016 12:00	Yes	2746	0.40	23.5	160.00	88.00	10.00	5.50
7/20/2016 13:20	Yes	3177	0.70	31.8	149.00	77.00	10.50	6.00
7/13/2017 16:50	No - System restart	3581	0.80	34.0	160.00	90.00	11.00	6.50
8/21/2017 16:45	No	4159	0.70	31.7	145.00	80.00	10.00	6.00
9/20/2017 8:50	Yes	4840	0.80	34.2	130.00	57.00	10.00	5.50
10/7/2017 9:30	AS System off - winterization	5250	0.80	34.5	140.00	62.00	10.50	6.00
4/2/2018 12:15	No - System restart	5706	0.80	34.5	135.00	50.00	9.50	5.50
5/17/2018 9:00	No	5709	0.80	34.6	150.00	70.00	11.00	6.50
6/20/2018 9:30	Yes	6529	0.80	36.6	161.00	94.00	11.00	10.00
7/25/2018 10:20	Yes	7184	0.80	33.2	170.00	91.00	10.00	5.50
8/22/2018 11:00	Yes	7857	0.80	34.9	150.00	73.00	10.50	7.00
9/28/2018 10:55	No	7999	0.75	34.4	120.00	56.00	11.50	7.00
10/26/2018 10:00	AS System off - winterization	8384	0.80	34.9	105.00	50.00	10.00	6.00
4/18/2019 10:25	No- System Restart (04/18/2019)	8404	1.00	32.8	55.00	53.00	10.00	0.00
5/24/2019 9:48	Yes	9189	1.00	41.8	65.00	70.00	11.00	10.00
6/19/2019 16:00	No	9626	1.00	41.2	82.00	85.00	10.00	10.00

Notes:

1. For each manifold arm, flowrate in calculated standard cubic feet per minute (SCFM) per applicable Dwyer Flow Sensor Calculations (Bulletin F-50). Based on pipe diamter K= 0.58.

Any Gas

$$Q\,(SCFM) = 128.8 \times K \times D^2 \times \sqrt{\frac{P \times \Delta P}{(T + 460) \times S_s}}$$

Technical Notations

The following notations apply:

ΔP = Differential pressure expressed in inches of water column
Q = Flow expressed in GPM, SCFM, or PPH as shown in equation
K = Flow coefficient— See values tabulated on Pg. 3.
D = Inside diameter of line size expressed in inches.

P = Static Line pressure (psia)
T = Temperature in degrees Fahrenheit (plus 460 = °Rankine)
p = Density of medium in pounds per square foot
S_f = Sp Gr at flowing conditions
S_s = Sp Gr at 60°F (15.6°C)

TABLE 2 - Air Sparge Well Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

		AS-01					AS-02					AS-03				
		AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments
mm/dd/yy hh:mm	Notes	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status
8/15/15 7:00		Open	2.00	5.00	14.50		Open	2.00	5.00	14.50		Open	0.00	4.00	12.00	
8/17/15 2:20		Open	0.00	5.00	11.00		Open	0.00	5.00	16.00		Open	0.00	4.00	9.00	
9/10/15 19:10	1,2	NR	NR	NR	NR		NR	NR	NR	NR		NR	NR	NR	NR	
10/2/15 12:30		Open	0.00	NR	13.00		Open	0.00	NR	13.00		Open	0.00	NR	11.00	
11/10/15 10:30		Open	1.70	NR	13.00		Open	1.50	NR	12.00		Open	0.00	NR	10.50	
4/15/16 14:30	3,4, 5	Open	6.50	NR	12.00		Open	6.50	NR	12.00		Open	3.50	2.50	6.00	
5/10/16 10:30	6	Open	7.00	5.00	12.50		Open	7.00	5.00	12.00		Open	3.50	3.50	6.00	
5/23/16 10:30	7	Open	7.50	NR	14.50		Open	7.00	NR	14.00		Open	3.50	NR	9.50	
6/16/16 12:00		Open	7.50	174.00	13.50		Open	7.50	168.00	13.50		Open	3.50	98.30	9.00	
7/20/16 13:20	8	Open	8.00	194.70	15.50		Open	8.00	191.80	15.50		Open	5.50	137.90	10.50	
7/13/17 16:25	9	Open	7.50	NR	16.00		Open	7.50	NR	15.50		Open	4.50	NR	11.00	
8/21/17 12:40		Open	7.00	159.10	16.00		Open	7.00	159.80	16.00		Open	9.50	112.80	10.50	
9/20/17 8:50		Open	8.00	5.21	16.00		Open	8.00	5.41	16.00		Open	4.50	3.82	11.00	
10/7/17 9:30	10	Open	6.70	NR	16.50		Open	6.60	NR	16.00		Open	0.00	NR	0.00	
4/2/18 12:15	12	Open	7.50	NR	17.00		Open	7.00	NR	17.50		Open	4.00	NR	12.00	
5/17/18 9:00	12	Open	9.00	NR	16.50		Open	8.00	NR	16.50		Open	5.00	140.00	12.00	
6/18/18 9:30		Open	8.50	170	16.00		Open	7.50	NR	16.00		Open	7.50	129.00	11.00	
7/25/18 10:15		Open	8.50	173	16.50		Open	8.00	NR	16.50		Open	5.50	120.00	11.00	
8/22/18 11:00		Open	8.50	165.4	16.00		Open	8.50	NR	16.00		Open	6.00	130.60	11.50	
9/28/18 10:55		Open	9.50	196	15.00		Open	9.00	NR	15.00		Open	6.50	NR	10.50	
10/26/18 10:00	13	Open	8.00	176	16.00		Open	7.50	178.00	17.00		Open	5.00	134.00	12.00	
4/18/19 10:25		Open	8.50	NR	18.00		Open	7.50	NR	18.00		Open	3.00	NR	13.00	
5/24/19 9:48		Open	8.00	4.5	19.00		Open	7.00	4.50	18.50		Open	5.50	4.00	12.00	
6/19/19 16:00		Open	9.00	NR	20.00		Open	9.00	NR	20.00		Open	5.00	NR	14.00	

NR = not recorded
1. System off upon arrival. Parameters may not have been recorded since steady state not reached.
2. Pressure not registering on pressure gauges. Field technician recommends replacing.
3. AS-1, AS-2, and AS-10 were buried in ice. Wellhead preassure readings were not collected.
4. AS-11 pressure gauge at manifold read "0". Recommend replacing.
5. AS-1 and AS-2 were turned off upon departure since it appeared no vacuum was being applied by SVE well in the vicinity, GEI-11. Potenital ice in SVE well.
6. Wellhead readings taken upon departure.
7. Startup after GWM event on 5/20/16, manifold readings recorded only.
8. During site visit conducted on 9/21/17, observed that power had been shut off by public utility (GVEA). System remained off for remainder of year.
9. System restarted after 2016/2017 winterization.
10. System shutoff the week of 10/23/17 for 2017/2018 winterization. System restart planned for 1Q18.
11. Air leaks observed at wellhead.
12. Based on April 2018 startup it appeared there was ice in AS lines so AS system remained until May 2018.
13. System turned off for 2018/2019 winterization.

TABLE 2 - Air Sparge Well Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

		AS-04					AS-05					AS-06				
		AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments
mm/dd/yy hh:mm	Notes	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status
8/15/15 7:00		Open	0.00	4.00	12.00		Open	0.00	4.00	12.00		Open	1.50	3.00	13.00	
8/17/15 2:20		Open	0.00	5.00	8.50		Open	0.00	4.00	9.00		Open	0.00	6.00	8.50	
9/10/15 19:10	1,2	NR	NR	NR	NR		NR	NR	NR	NR		NR	NR	NR	NR	
10/2/15 12:30		Open	0.00	NR	11.00		Open	0.00	NR	11.00		Open	0.00	NR	10.00	
11/10/15 10:30		Open	0.00	NR	11.00		Open	0.00	NR	10.00		Open	2.00	NR	7.50	
4/15/16 14:30	3,4, 5	Open	3.50	3.00	6.00		Open	2.50	3.50	6.00		Open	6.00	4.50	6.00	
5/10/16 10:30	6	Open	4.00	4.50	6.50		Open	2.50	4.00	6.50		Open	5.50	5.00	6.50	
5/23/16 10:30	7	Open	4.00	NR	9.00		Open	2.50	NR	9.50		Open	6.00	NR	9.50	
6/16/16 12:00		Open	4.50	118.80	9.00		Open	3.00	113.10	9.50		Open	6.50	149.10	9.50	
7/20/16 13:20	8	Open	4.50	148.10	10.50		Open	5.50	145.70	12.00		Open	6.50	NA	11.00	Inaccessible
7/13/17 16:25	9	Open	3.50	NR	11.00		Open	3.50	NR	12.00		Open	6.50	NR	12.00	
8/21/17 12:40		Open	5.00	129.30	10.00		Open	3.50	127.80	12.00		Open	5.00	164.80	11.00	
9/20/17 8:50		Open	5.00	4.41	11.00		Open	3.50	4.25	12.00		Open	5.50	5.22	11.00	
10/7/17 9:30	10	Open	1.50	NR	<1		Open	0.00	NR	0.00		Open	4.50	NR	<1	
4/2/18 12:15	12	Open	4.50	NR	12.00		Open	3.00	NR	12.00		Open	6.00	NR	11.50	
5/17/18 9:00	12	Open	5.50	148	13.00		Open	3.50	142	12.00		Open	7.00	170	11.00	
6/18/18 9:30		Open	6.00	133	12.00		Open	4.00	133	12.00		Open	6.50	172	11.00	
7/25/18 10:15		Open	5.50	120	12.50		Open	4.00	126	12.00		Open	7.00	157	11.00	
8/22/18 11:00		Open	6.00	138.9	12.50		Open	4.00	132.8	12.00		Open	6.00	155.6	10.00	
9/28/18 10:55		Open	6.50	177.8	12.50		Open	5.00	154.8	12.00		Open	7.00	181.6	8.50	
10/26/18 10:00	13	Open	5.50	141	12.00		Open	3.50	136	11.00		Open	6.00	161	9.00	
4/18/19 10:25		Open	4.50	NR	13.00		Open	4.50	NR	13.00		Open	6.00	NR	18.00	
5/24/19 9:48		Open	5.00	4.5	12.00		Open	4.00	NR	14.00	Inaccessible	Open	6.00	5	13.00	
6/19/19 16:00		Open	5.00	NR	14.00		Open	3.00	NR	14.00		Open	5.00	NR	6.00	

NR = not recorded
1. System off upon arrival. Parameters may not have been recorded since steady state not reached.
2. Pressure not registering on pressure gauges. Field technician recommends replacing.
3. AS-1, AS-2, and AS-10 were buried in ice. Wellhead preassure readings were not collected.
4. AS-11 pressure gauge at manifold read "0". Recommend replacing.
5. AS-1 and AS-2 were turned off upon departure since it appeared no vacuum was being applied by SVE well in the vicinity, GEI-11. Potenital ice in SVE well.
6. Wellhead readings taken upon departure.
7. Startup after GWM event on 5/20/16, manifold readings recorded only.
8. During site visit conducted on 9/21/17, observed that power had been shut off by public utility (GVEA). System remained off for remainder of year.
9. System restarted after 2016/2017 winterization.
10. System shutoff the week of 10/23/17 for 2017/2018 winterization. System restart planned for 1Q18.
11. Air leaks observed at wellhead.

TABLE 2 - Air Sparge Well Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

		AS-07					AS-08					AS-09				
		AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments
mm/dd/yy hh:mm	Notes	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status
8/15/15 7:00		Open	2.00	4.00	12.00		Open	3.50	4.00	12.00		Open	1.50	5.00	12.00	
8/17/15 2:20		Open	0.00	6.00	8.00		Open	1.20	6.00	9.50		Open	0.00	4.00	8.50	
9/10/15 19:10	1,2	NR	NR	NR	NR		NR	NR	NR	NR		NR	NR	NR	9.00	
10/2/15 12:30		Open	0.00	NR	10.00		Open	0.00	NR	10.00		Open	0.00	NR	10.00	
11/10/15 10:30		Open	2.00	NR	9.50		Open	4.00	NR	11.50		Open	3.00	NR	9.50	
4/15/16 14:30	3,4, 5	Open	4.00	4.50	6.00		Open	5.00	4.50	6.00		Open	2.00	1.00	6.00	
5/10/16 10:30	6	Open	4.50	4.50	6.50		Open	6.50	4.50	6.00		Open	3.00	5.5	6.50	
5/23/16 10:30	7	Open	4.50	NR	9.00		Open	8.00	NR	8.50		Open	6.50	NR	8.50	
6/16/16 12:00		Open	5.50	158.80	8.50		Open	8.00	168.10	8.00		Open	7.00	174.3	11.00	
7/20/16 13:20	8	Open	5.50	163.70	10.50		Open	8.50	188.10	12.00		Open	7.50	195.6	10.50	11
7/13/17 16:25	9	Open	5.00	NR	11.50		Open	9.00	NR	11.00		Open	9.50	NR	10.00	
8/21/17 12:40		Open	5.50	152.70	11.50		Open	9.50	206.30	10.50		Open	7.50	NR	10.00	Inaccessble
9/20/17 8:50		Open	4.50	5.05	11.00		Open	6.50	5.55	13.00		Open	8.00	7.29	10.00	
10/7/17 9:30	10	Open	3.00	NR	<1		Open	3.25	NR	<1		Open	0.00	NR	0.00	
4/2/18 12:15	12	Open	5.00	NR	12.00		Open	8.00	NR	12.50		Open	7.00	NR	11.50	
5/17/18 9:00	12	Open	6.00	157	12.00		Open	10.00	223	12.00		Open	8.50	203	12.00	
6/18/18 9:30		Open	5.50	159	11.50		Open	9.50	159	11.50		Open	8.50	180	10.50	
7/25/18 10:15		Open	6.00	150	12.00		Open	10.00	206	12.50		Open	8.50	183	10.50	
8/22/18 11:00		Open	5.00	150.9	11.00		Open	8.00	174.8	15.00		Open	8.00	171.8	11.00	
9/28/18 10:55		Open	6.00	175.2	9.50		Open	8.50	215.3	16.50		Open	8.50	187.6	11.00	
10/26/18 10:00	13	Open	6.00	155	11.00		Open	8.00	202	14.00		Open	7.00	174	10.00	
4/18/19 10:25		Open	12.00	NR	NR		Open	9.00	NR	18.00		Open	7.50	NR	11.00	
5/24/19 9:48		Open	5.50	5	16.00		Open	8.00	6	10.00		Open	10.50	8	13.00	
6/19/19 16:00		Open	4.00	NR	11.00		Open	5.00	NR	9.00		Open	10.00	NR	13.00	

NR = not recorded
1. System off upon arrival. Parameters may not have been recorded since steady state not reached.
2. Pressure not registering on pressure gauges. Field technician recommends replacing.
3. AS-1, AS-2, and AS-10 were buried in ice. Wellhead preassure readings were not collected.
4. AS-11 pressure gauge at manifold read "0". Recommend replacing.
5. AS-1 and AS-2 were turned off upon departure since it appeared no vacuum was being applied by SVE well in the vicinity, GEI-11. Potenital ice in SVE well.
6. Wellhead readings taken upon departure.
7. Startup after GWM event on 5/20/16, manifold readings recorded only.
8. During site visit conducted on 9/21/17, observed that power had been shut off by public utility (GVEA). System remained off for remainder of year.
9. System restarted after 2016/2017 winterization.
10. System shutoff the week of 10/23/17 for 2017/2018 winterization. System restart planned for 1Q18.
11. Air leaks observed at wellhead.

TABLE 2 - Air Sparge Well Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

		AS-10					AS-11					AS-12				
		AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments	AS Valve Position	AS Pressure	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow	Comments
mm/dd/yy hh:mm	Notes	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status	open/closed	psi		cfm	Well Status
8/15/15 7:00		Open	0.00	4.00	12.00		Open	0.00	4.00	12.00		Open	0.00	5.00	12.00	
8/17/15 2:20		Open	0.00	4.00	9.00		Open	0.00	4.00	7.50		Open	0.00	4.00	8.50	
9/10/15 19:10	1,2	NR	NR	NR	9.00		NR	NR	NR	9.00		NR	NR	NR	NR	
10/2/15 12:30		Open	0.00	NR	10.00		Open	0.00	NR	12.00		Open	0.00	NR	10.50	
11/10/15 10:30		Open	2.00	NR	9.00		Open	2.00	NR	Broken		Open	0.00	NR	11.00	
4/15/16 14:30	3,4, 5	Open	3.50	NR	6.00		Open	0.00	3.00	6.00		Open	2.50	3.50	6.00	
5/10/16 10:30	6	Open	4.50	3.50	6.50		Open	1.50	4.00	6.50		Open	1.50	3.50	7.00	
5/23/16 10:30	7	Open	4.50	NR	8.50		Open	5.50	NR	9.00		Open	5.00	NR	8.50	
6/16/16 12:00		Open	4.50	110.40	8.50		Open	3.00	116.20	8.50		Open	6.00	129.10	8.00	
7/20/16 13:20	8	Open	5.50	132.40	11.50		Open	2.00	148.10	12.00		Open	5.50	154.50	10.50	
7/13/17 16:25	9	Open	6.50	NR	11.00		Open	3.50	NR	10.00		Open	6.50	NR	10.50	
8/21/17 12:40		Open	5.00	114.20	12.00		Open	1.50	114.90	12.00		Open	11.00	122.60	11.00	
9/20/17 8:50		Open	5.00	4.06	12.00		Open	1.00	3.94	12.00		Open	7.00	4.56	11.00	
10/7/17 9:30	10	Open	2.20	NR	<1		Open	0.00	NR	0.00		Open	2.25	NR	<1	
4/2/18 12:15	12	Open	5.50	NR	12.50		Open	2.00	NR	12.00		Open	6.50	NR	12.00	
5/17/18 9:00	12	Open	6.50	132	12.00		Open	3.50	143	10.50		Open	8.00	157	11.50	
6/18/18 9:30		Open	7.00	119	11.50		Open	4.00	125	11.50		Open	8.00	157	11.00	
7/25/18 10:15		Open	7.00	125	12.00		Open	4.00	141	11.00		Open	7.50	143	12.00	
8/22/18 11:00		Open	7.00	114.9	12.00		Open	3.50	125	11.00		Open	8.00	145.1	12.00	
9/28/18 10:55		Open	7.50	147.3	11.00		Open	4.50	155.3	10.50		Open	9.00	167.1	11.00	
10/26/18 10:00	13	Open	5.50	135	12.00		Open	2.00	142	12.00		Open	7.00	149	12.00	
4/18/19 10:25		Open	4.00	NR	11.00		Open	<1	NR	11.00		Open	7.00	NR	12.00	
5/24/19 9:48		Open	6.50	3	12.00		Open	3.00	NR	11.00	Inaccessible	Open	5.00	3.5	13.00	
6/19/19 16:00		Open	6.00	NR	13.00		Open	3.00	NR	13.00		Open	8.00	NR	13.00	

NR = not recorded
1. System off upon arrival. Parameters may not have been recorded since steady state not reached.
2. Pressure not registering on pressure gauges. Field technician recommends replacing.
3. AS-1, AS-2, and AS-10 were buried in ice. Wellhead preassure readings were not collected.
4. AS-11 pressure gauge at manifold read "0". Recommend replacing.
5. AS-1 and AS-2 were turned off upon departure since it appeared no vacuum was being applied by SVE well in the vicinity, GEI-11. Potenital ice in SVE well.
6. Wellhead readings taken upon departure.
7. Startup after GWM event on 5/20/16, manifold readings recorded only.
8. During site visit conducted on 9/21/17, observed that power had been shut off by public utility (GVEA). System remained off for remainder of year.
9. System restarted after 2016/2017 winterization.
10. System shutoff the week of 10/23/17 for 2017/2018 winterization. System restart planned for 1Q18.
11. Air leaks observed at wellhead.

TABLE 2 - Air Sparge Well Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, AK

		AS-13					AS-14				
mm/dd/yy hh:mm	Notes	AS Valve Position open/closed	AS Pressure psi	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow cfm	Comments Well Status	AS Valve Position open/closed	AS Pressure psi	Wellhead pressure *psi - prior to 06/16/16 in wc - on and after 06/16/16 (1 in wc = 0.0361 psi)	AS Flow cfm	Comments Well Status
8/15/15 7:00		Open	0.00	5.00	12.00		Open	6.00	5.00	12.00	
8/17/15 2:20		Open	0.00	4.00	8.50		Open	4.20	5.00	8.50	
9/10/15 19:10	1,2	NR	NR	NR	NR		NR	NR	NR	NR	
10/2/15 12:30		Open	0.00	NR	10.00		Open	0.00	NR	10.00	
11/10/15 10:30		Open	0.50	NR	9.50		Open	7.80	NR	9.50	
4/15/16 14:30	3,4, 5	Open	4.00	3.50	6.00		Open	4.00	3.00	6.00	
5/10/16 10:30	6	Open	5.00	3.50	6.50		Open	4.50	4.00	6.00	
5/23/16 10:30	7	Open	5.50	NR	8.50		Open	3.00	NR	9.00	
6/16/16 12:00		Open	4.50	130.60	8.00		Open	5.50	136.50	8.00	
7/20/16 13:20	8	Open	6.50	158.40	10.50		Open	6.50	158.40	10.50	
7/13/17 16:25	9	Open	5.60	NR	11.00		Open	6.00	NR	11.00	
8/21/17 12:40		Open	5.00	125.00	11.00		Open	6.00	136.30	11.00	
9/20/17 8:50		Open	5.00	NR	11.50		Open	6.00	4.80	11.00	
10/7/17 9:30	10	Open	0.00	NR	0.00		Open	3.50	NR	<1	
4/2/18 12:15	12	Open	5.00	NR	12.00		Open	5.50	NR	12.00	
5/17/18 9:00	12	Open	6.00	159	12.00		Open	6.50	NR	11.50	
6/18/18 9:30		Open	6.00	160	12.00		Open	6.50	NR	12.00	
7/25/18 10:15		Open	6.00	NR	12.50		Open	6.00	142	11.50	
8/22/18 11:00		Open	6.00	145.5	12.00		Open	6.50	146	12.00	
9/28/18 10:55		Open	7.00	166.4	11.50		Open	7.50	169.9	11.50	
10/26/18 10:00	13	Open	5.50	148	12.00		Open	6.00	NR	11.00	Inaccessible
4/18/19 10:25		Open	5.00	NR	12.00		Open	6.00	NR	12.00	
5/24/19 9:48		Open	6.00	NR	13.00	Inaccessible	Open	5.50	NR	12.00	Inaccessible
6/19/19 16:00		Open	6.00	NR	13.00		Open	6.00	NR	12.00	

NR = not recorded
1. System off upon arrival. Parameters may not have been recorded since steady state not reached.
2. Pressure not registering on pressure gauges. Field technician recommends replacing.
3. AS-1, AS-2, and AS-10 were buried in ice. Wellhead preassure readings were not collected.
4. AS-11 pressure gauge at manifold read "0". Recommend replacing.
5. AS-1 and AS-2 were turned off upon departure since it appeared no vacuum was being applied by SVE well in the vicinity, GEI-11. Potenital ice in SVE well.
6. Wellhead readings taken upon departure.
7. Startup after GWM event on 5/20/16, manifold readings recorded only.
8. During site visit conducted on 9/21/17, observed that power had been shut off by public utility (GVEA). System remained off for remainder of year.
9. System restarted after 2016/2017 winterization.
10. System shutoff the week of 10/23/17 for 2017/2018 winterization. System restart planned for 1Q18.
11. Air leaks observed at wellhead.

TABLE 3 - Soil Vapor Extraction Manifold Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, Alaska

Date and Time	SVE well ID	Comments	SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	Manifold Differential Pressure	SVE Flow (at manifold) - see notes 1, 11	AS Group in Operation	SVE Conc. (PID) - See Notes 2, 3	SVE Conc. (LEL) - See Notes 2, 3	Mass Removal Rate
mm/dd/yy hh:mm		Well Status	% open	in H_2O	in H_2O	in H_2O	scfm		ppmv	%	lbs/day
8/15/15 7:00	GEI-2		NR	18	26	1.4	59.65	2	856.00	5.00	16.29
8/15/15 7:00	GEI-11		NR	14	19	0.4	32.18	1	602.00	5.00	6.18
8/15/15 7:00	SVE-1		NR	4	22	1.6	64.11	4	792.00	12.00	16.20
8/15/15 7:00	GEI-7		NR	21	20	0.75	44.01	5	476.00	13.00	6.68
8/15/15 7:00	GEI-1		NR	14	21	0.9	48.14	3	816.00	25.00	12.53
8/16/15 12:50	GEI-2		NR	16	26	1.1	52.88	2	NR	NR	NC
8/16/15 12:50	GEI-11		NR	14	20	0.57	38.36	1	NR	NR	NC
8/16/15 12:50	SVE-1		NR	6	21	1.7	66.17	4	NR	NR	NC
8/16/15 12:50	GEI-7		NR	5	19	2.3	77.16	5	NR	NR	NC
8/16/15 12:50	GEI-1		NR	17	22	1.1	53.15	3	NR	NR	NC
8/17/15 2:20	GEI-2		NR	10.00	15	0.42	33.14	2	794	4	8.39
8/17/15 2:20	GEI-11		NR	14.00	20	0.56	38.02	1	736	5	8.93
8/17/15 2:20	SVE-1		NR	14.00	18	1.35	59.19	4	716	5	13.52
8/17/15 2:20	GEI-7		NR	10.00	16	0.60	39.56	5	470	4	5.93
8/17/15 2:20	GEI-1		NR	10.00	13	0.60	39.71	3	952	16	12.06
9/10/15 19:10	GEI-2		NR	NR	11	NR	NC	2	622- note 4	2 - note 4	NC
9/10/15 19:10	GEI-11		NR	NR	10	NR	NC	1	452 - note 4	2 - note 4	NC
9/10/15 19:10	SVE-1		NR	NR	9	NR	NC	4	448	4	NC
9/10/15 19:10	GEI-7		NR	NR	NR	NR	NC	5	430 - note 4	1 - note 4	NC
9/10/15 19:10	GEI-1		NR	NR	11	NR	NC	3	1116 - note 4	10 - note 4	NC
10/2/15 12:30	GEI-2		100.00	NR	16	-- see note 5	NC	2	212	2	NC
10/2/15 12:30	GEI-11		100.00	NR	16	0.29	27.50	1	451	5	3.96
10/2/15 12:30	SVE-1		100.00	NR	16	-- see note 5	NC	4	355	5	NC
10/2/15 12:30	GEI-7		0.00	--	--	--	--	5	--	--	--
10/2/15 12:30	GEI-1		100.00	NR	11	0.29	27.68	3	649	6	5.73
11/10/15 10:30	GEI-2		12.00	NR	14	0.10	16.19	2	204	1	NC
11/10/15 10:30	GEI-11		35.00	NR	17	0.05	11.41	1	168	1	0.61
11/10/15 10:30	SVE-1		25.00	NR	16	-- see note 5	NC	4	331	1	NC
11/10/15 10:30	GEI-7		6.00	NR	0	-- see note 5	NC	5	170	0	NC
11/10/15 10:30	GEI-1		20.00	NR	16	0.25	25.54	3	528	1	4.30
4/15/16 2:30	GEI-2		NR	0.00	12	1.30	58.53	2	226.8	1	4.23
4/15/16 2:30	GEI-11		NR	NR	11	0.00	0.00	1	89.2	0	0.00
4/15/16 2:30	SVE-1	see Note 7, 8	NR	NR	6	0.52	37.30	4	229.8	2	2.73
4/15/16 2:30	GEI-7		NR	0.00	5	0.28	27.40	5	128.8	0	1.13
4/15/16 2:30	GEI-1		NR	0.00	10	0.05	11.51	3	417.4	7	1.53
5/10/16 10:30	GEI-2		NR	0.00	10	1.30	58.68	2	222	1	4.16
5/10/16 10:30	GEI-11		NR	0.00	0	0	0.00	1	138	0	0.00
5/10/16 10:30	SVE-1	Note 9	NR	0.00	5	0.48	35.88	4	166	1	1.90
5/10/16 10:30	GEI-7		NR	0.00	5	0.34	30.20	5	134	0	1.29
5/10/16 10:30	GEI-1		NR	0.00	9	0.05	11.52	3	856	5	3.15
5/23/16 10:30	GEI-2		NR	0.00	5	0.05	11.58	2	NR	1	NC
5/23/16 10:30	GEI-11		NR	0.00	10	0	25.73	1	NR	0	NC
5/23/16 10:30	SVE-1	Note 10	NR	0.00	4	0.45	34.78	4	NR	1	NC
5/23/16 10:30	GEI-7		NR	0.00	4	0.28	27.44	5	NR	0	NC
5/23/16 10:30	GEI-1		NR	0.00	15	0.32	28.93	3	NR	5	NC
6/16/16 12:00	GEI-2		NR	3.3	6.00	0.50	36.57	2	123	1	NC
6/16/16 12:00	GEI-11		NR	7.7	14.00	0.22	24.02	1	213	2	NC
6/16/16 12:00	SVE-1		NR	1	4.00	0.46	35.17	4	80	1	NC
6/16/16 12:00	GEI-7		NR	0.9	4.00	0.30	28.40	5	89	1	NC
6/16/16 12:00	GEI-1		NR	9.8	16.00	0.32	28.89	3	296	1	NC
7/20/16 13:20	GEI-2		NR	0.80	8	0.35	30.52	2	94	1	0.92
7/20/16 13:20	GEI-11		NR	9.10	14	0	24.02	1	157	1	1.20
7/20/16 13:20	SVE-1		NR	1.40	4	0.48	35.92	4	555	7	6.36
7/20/16 13:20	GEI-7		NR	4.10	3	0.32	29.37	5	50	0	0.47
7/20/16 13:20	GEI-1		NR	6.00	16	0.32	28.89	3	407	5	3.75
7/13/16 16:25	GEI-2		NR	NR	6	0.35	30.60	2	56	0	0.55
7/14/16 16:25	GEI-11		NR	NR	8	0	22.10	1	142	2	1.00
7/15/16 16:25	SVE-1		NR	NR	4	0.48	39.20	4	128	2	1.60
7/16/16 16:25	GEI-7		NR	NR	4	0.32	44.00	5	115	0	1.61
7/17/16 16:25	GEI-1		NR	NR	7	0.32	75.50	3	56	0	1.35

TABLE 3 - Soil Vapor Extraction Manifold Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, Alaska

Date and Time	SVE well ID	Comments	SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	Manifold Differential Pressure	SVE Flow (at manifold) - see notes 1, 11	AS Group in Operation	SVE Conc. (PID) - See Notes 2, 3	SVE Conc. (LEL) - See Notes 2, 3	Mass Removal Rate
mm/dd/yy hh:mm		Well Status	% open	in H_2O	in H_2O	in H_2O	scfm		ppmv	%	lbs/day
8/21/17 1:40	GEI-2		NR	NR	6	0.60	53.00	2	161	1	2.72
8/21/17 1:40	GEI-11		NR	NR	7	0.12	20.80	1	109	1	0.72
8/21/17 1:40	SVE-1		NR	NR	4	0.40	38.90	4	164	2	2.04
8/21/17 1:40	GEI-7		NR	NR	4	0.50	46.70	5	35	0	0.52
8/21/17 1:40	GEI-1		NR	NR	14	1.10	80.50	3	65	0	1.67
9/20/17 8:50	GEI-2		NR	4.00	5	0.50	36.62	2	102	0	1.19
9/20/17 8:50	GEI-11		NR	5.50	7	0	22.10	1	198	2	1.40
9/20/17 8:50	SVE-1		NR	2.10	4	0.47	39.20	4	276	3	3.45
9/20/17 8:50	GEI-7		NR	0.00	5	0.98	44.00	5	75	1	1.05
9/20/17 8:50	GEI-1		NR	2.00	11	0.86	75.50	3	38	0	0.92
10/7/17 9:30	GEI-2		NR	4.00	5	0.50	37.80	2	62	0	0.75
10/7/17 9:30	GEI-11		NR	5.50	7	0	24.40	1	113	0	0.88
10/7/17 9:30	SVE-1		NR	2.10	3	0.50	28.20	4	225	0	2.02
10/7/17 9:30	GEI-7		NR	0.00	4	0.90	55.50	5	92	0	1.63
10/7/17 9:30	GEI-1		NR	2.00	10	0.80	49.20	3	46	0	0.72
4/2/18 10:30	GEI-2	See Note 12	NR	NR	7	0.50	56.50	2	0	0	0.00
4/2/18 10:30	GEI-11		NR	NR	7	0.12	26.00	1	0	0	0.00
4/2/18 10:30	SVE-1		NR	NR	4	0.53	40.00	4	0	0	0.00
4/2/18 10:30	GEI-7		NR	NR	7	0.00	86.50	5	0	0	0.00
4/2/18 10:30	GEI-1		NR	NR	11	0.44	50.00	3	0	0	0.00
5/17/18 9:00	GEI-2		NR	6.10	8	0.80	67.00	2	180	1	3.85
5/17/18 9:00	GEI-11	See Note 13	NR	NR	9	0.08	23.30	1	330	1	2.45
5/17/18 9:00	SVE-1		NR	2.20	6	0.62	39.70	4	290	2	3.67
5/17/18 9:00	GEI-7		NR	0.00	0	0.00	0.08	5	55	5	0.00
5/17/18 9:00	GEI-1		NR	1.00	12	>0.1	70.50	3	33	4	0.74
6/18/18 10:00	GEI-2		NR	6.60	9	0.79	255.80	2	225	0	18.36
6/18/18 10:00	GEI-11		NR	8.20	8	0.06	84.00	1	301	1	8.07
6/18/18 10:00	SVE-1		NR	2.80	4	0.51	153.40	4	422	2	20.65
6/18/18 10:00	GEI-7		NR	0.80	0	0.01	0.20	5	87	1	0.01
6/18/18 10:00	GEI-1		NR	2.20	14	0.96	282.10	3	47	0	4.23
7/25/18 10:15	GEI-2		NR	6.70	9	0.75	131.40	2	244	0	10.23
7/25/18 10:15	GEI-11	See Note 13	NR	NR	8	0.08	47.30	1	323	0	4.87
7/25/18 10:15	SVE-1		NR	2.60	6	0.59	85.70	4	408	0	11.15
7/25/18 10:15	GEI-7		NR	0.80	0	0.00	0.10	5	96	0	0.00
7/25/18 10:15	GEI-1		NR	2.20	12	>1.0	141.00	3	61	0	2.74
8/22/18 10:45	GEI-2		NR	6.90	9	0.67	50.00	2	256	0	4.08
8/22/18 10:45	GEI-11		NR	0.50	9	0.00	20.80	1	379	1	2.51
8/22/18 10:45	SVE-1		NR	2.10	6	0.59	34.80	4	413	2	4.58
8/22/18 10:45	GEI-7		NR	0.00	0	0.01	0.45	5	68	0	0.01
8/22/18 10:45	GEI-1		NR	1.40	12	0.92	60.00	3	87	0	1.67
9/28/18 10:55	GEI-2		NR	8.20	8	0.45	43.00	2	362	2	4.97
9/28/18 10:55	GEI-11	See Note 13	NR	NR	9	0.10	16.50	1	224	2	1.18
9/28/18 10:55	SVE-1		NR	1.60	6	0.70	32.80	4	473	6	4.95
9/28/18 10:55	GEI-7		NR	0.00	0	0.00	0.09	5	59	1	0.00
9/28/18 10:55	GEI-1		NR	1.10	12	>1.0	54.50	3	47	1	0.82
10/26/19 10:00	GEI-2		NR	6.60	9	0.40	129.00	2	236	0	9.71
10/26/19 10:00	GEI-11	See Note 13	NR	NR	9	0.18	42.00	1	144	0	1.93
10/26/19 10:00	SVE-1		NR	2.10	7	0.68	99.00	4	252	1	7.96
10/26/19 10:00	GEI-7		NR	0.00	0	0.02	0.02	5	51	0	0.00
10/26/19 10:00	GEI-1		NR	1.20	13	0.00	163.00	3	52	0	2.70
4/18/19 9:00	GEI-2		100.00	10.00	15	0.90	48.52	2	160	1	2.48
4/18/19 9:00	GEI-11		40.00	10.00	11	0.00	0.00	1	88	0	0.00
4/18/19 9:00	SVE-1		70.00	8.00	8	0.70	43.17	4	133	4	1.83
4/18/19 9:00	GEI-7		40.00	7.00	6	0.90	49.07	5	37	0	0.58
4/18/19 9:00	GEI-1		20.00	12.00	14	0.85	47.21	3	22	0	0.33
5/24/19 9:39	GEI-2		100.00	9.60	8	0.40	32.63	2	49	0	0.51
5/24/19 9:39	GEI-11		40.00	5.80	8	0.06	12.64	1	90	0	0.36
5/24/19 9:39	SVE-1		70.00	NR	6	0.60	40.06	4	82	0	1.05
5/24/19 9:39	GEI-7		40.00	0.00	5	0.80	46.32	5	8	0	0.12
5/24/19 9:39	GEI-1		20.00	0.50	10	0.38	31.72	3	5	0	0.05

TABLE 3 - Soil Vapor Extraction Manifold Data
Former Chevron Facility 306456
328 1/2 Illinois Street, Fairbanks, Alaska

Date and Time	SVE well ID	Comments	SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	Manifold Differential Pressure	SVE Flow (at manifold) - see notes 1, 11	AS Group in Operation	SVE Conc. (PID) - See Notes 2, 3	SVE Conc. (LEL) - See Notes 2, 3	Mass Removal Rate
mm/dd/yy hh:mm		Well Status	% open	in H_2O	in H_2O	in H_2O	scfm		ppmv	%	lbs/day
6/11/19 16:00	GEI-2		NR	NR	10	10.00	162.75	2	48	0	2.49
6/11/19 16:00	GEI-11		NR	NR	10	10.00	162.75	1	69	0	3.58
6/11/19 16:00	SVE-1		NR	NR	9	9.00	154.59	4	93	0	4.59
6/11/19 16:00	GEI-7		NR	NR	9	9.00	154.59	5	27	0	1.33
6/11/19 16:00	GEI-1		NR	NR	10	10.00	162.75	3	18	0	0.93

Notes:
NR = Not recorded.
NC = Not calculated.
1. For years 2015 and 2016 each manifold arm, flowrate in calculated standard cubic feet per minute (SCFM) per applicable Dwyer Flow Sensor Calculations (Bulletin F-50). Based on pipe diamter K= 0.64.
Temperature at manifold is not record; for calculation assumed = 60oF since SVE piping is equipped with heat trace.

3. Any Gas

$$Q\ (SCFM) = 128.8 \times K \times D^2 \times \sqrt{\frac{P \times \Delta P}{(T + 460) \times S_s}}$$

Technical Notations

The following notations apply:

ΔP = Differential pressure expressed in inches of water column
Q = Flow expressed in GPM, SCFM, or PPH as shown in equation
K = Flow coefficient— See values tabulated on Pg. 3.
D = Inside diameter of line size expressed in inches.

P = Static Line pressure (psia)
T = Temperature in degrees Fahrenheit (plus 460 = °Rankine)
p = Density of medium in pounds per square foot
S_f = Sp Gr at flowing conditions
S_s = Sp Gr at 60°F (15.6°C)

2. If possible, reading that is reported is when AS zone in the vicinity is operating. Readings from other wells can be found on field data sheets.
GEI-11 = AS Group 1 (AS-1, AS-2)
GEI-2 = AS Group 2 (AS-3, AS-4, AS-5)
GEI-1 = AS Group 3 (AS-6, AS-7, AS-8)
SVE-1 = AS Group 4 (AS-9, AS-10, AS-11)
GEI-7 = AS Group 5 (AS-12, AS-13, AS-14)
3. GRO Recovery (lb/day) = Effluent (ppmv) * (change hours (hr))* Flow (scfm) * 3.19E-4 (lb-day/ft^3/min)
4. Readings when AS group 4 was in opertion.
5. Reading at mag gauge not collected at because its full of water or not registering. For future site visits, additional flow rates measurements will be taken using a handheld anemometer.
6. Hairline crack observed on arms of all wells except GEI-7 downstream of gate valve. System was shutdown upon departure. Prior to system startup in the Spring 2016, these cracks will be repaired, or since the unit is equipped with 10 SVE manifold arms, conveyance piping will be reconnected to undamaged arms not used during 2015.
7. No vaccuum observed at GEI-11 during startup on April 15, 2016, may be due to ice in the well. Closed well upon departure.
8. PID and LEL values are recorded while each AS leg is in operation. Began using average PID and LEL values on table 4/15/16 to calculate mass removal rate.
9. No wellhead vacuum registered because range of vacuum gauge too high
10. System readings recorded after restarted after 1SA2016 GWM.
11. For year 2017, flowrate measured using anemometer.
12. Well head vacuum readings not collected due to potential ice block (no heat trace)
13. Well head port is damaged, wellhead vacuum reading cannot be collected

TABLE 4 - Air Sparge/Soil Vapor Extraction Analytical Data and Mass Recovery
Former Chevron Facility 306456
328 ½ Illinois Street Fairbanks, Alaska

Date and Time Sampled	Hour Meter Reading	Hours of Operation During Period	Pre-Blower Vacuum	Flow Rate	Benzene[1]	Toluene[1]	Ethylbenzene[1]	Total Xylenes[1]	GRO[2]	Post-Blower Conc. (PID)	GRO Recovery Rate	Net GRO Removed	Cumulative GRO Recovery	Notes
		(hours)	in H_2O	(scfm)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	ppmv - see note 1	(lbs/day)	(lbs)	(lbs)	
8/15/2015 7:00	40	NC	33	--	--	--	--	--	--	796	--	NC	NC	1
8/16/2015 12:50	60	20.00	27.5	--	--	--	--	--	--	NR	--	NC	NC	1,2
8/17/15 14:20	75	15.00	47.50	142.67	15	32	2 J	16	1100	776	50.06	NC	NC	1
9/10/15 19:10	262	187.00	26.00	146.96	--	--	--	--	--	532	51.57	401.8	401.8	
10/2/15 12:30	708	446.00	22.00	140.95	9	13	<0.8	7	670	524	30.12	559.8	961.6	3
11/10/15 10:30	1419	711.00	35.00	137.21	--	--	--	--	--	374	29.33	868.8	1830.4	4
4/15/16 2:30	1419	0.00	19.00	124.35	7	16	0.8	10	750	314	29.75	0.0	1830.4	4
5/10/16 10:30	2021	602.00	22.00	153.00	--	--	--	--	--	90	36.61	918.2	2748.6	
5/23/16 10:30	2288	267.00	18.00	128.00	--	--	--	--	--	NA	--	--	2748.6	5
6/16/16 0:00	2866	578.00	22.00	132.00	--	--	--	--	--	246	31.58	760.6	3509.2	
7/13/17 18:30	3701	835.00	13.00	159.00	2	3	<0.8	5	310	132	15.72	547.0	4056.2	
8/21/17 13:00	4276	575.00	20.00	161.00	--	--	--	--	--	132	15.92	381.4	4437.7	
9/20/17 9:21	4961	685.00	7.00	166.30	--	--	--	--	--	184	16.45	469.4	4907.0	
10/7/17 11:00	5370	409.00	13.00	160.00	1 J	4	<0.8	2 J	180	69	9.19	156.6	5063.6	6
4/3/18 10:30	5827	457.00	7.00	163.00	<1	<2	<0.8	<0.7	<10	0	0.26	5.0	5068.6	7
5/17/18 10:00	6870	1043.00	9.00	154.00	--	--	--	--	--	110	0.25	10.7	5079.2	
6/20/18 10:00	7686	816.00	10.00	154.00	--	--	--	--	--	204	0.25	8.4	5087.6	
7/25/18 10:20	8346	660.00	10.00	150.00	--	--	--	--	--	182	7.18	197.4	5285.0	8
8/22/18 10:45	9018	672.00	10.00	154.00	--	--	--	--	--	238	7.37	206.3	5491.3	8
9/28/18 10:55	9161	143.00	9.00	159.00	1 J	3	<0.8	2 J	150	226	7.61	45.3	5536.6	
10/26/18 10:00	9545	384.00	9.00	145.00	<1	4	<0.8	5	180	160	8.33	133.2	5669.8	
4/18/19 9:00	9564	19.00	32.00	160.00	2 J	6	<0.8	6	230	84	11.74	9.3	5679.1	
5/24/19 9:39	10350	786.00	16.00	177.00	<1	<2	<0.8	<0.7	140	37	7.90	258.9	5938.0	
6/19/19 16:00	10788	438.00	1.00	185.00	--	--	--	--	--	41	8.26	150.8	6088.8	

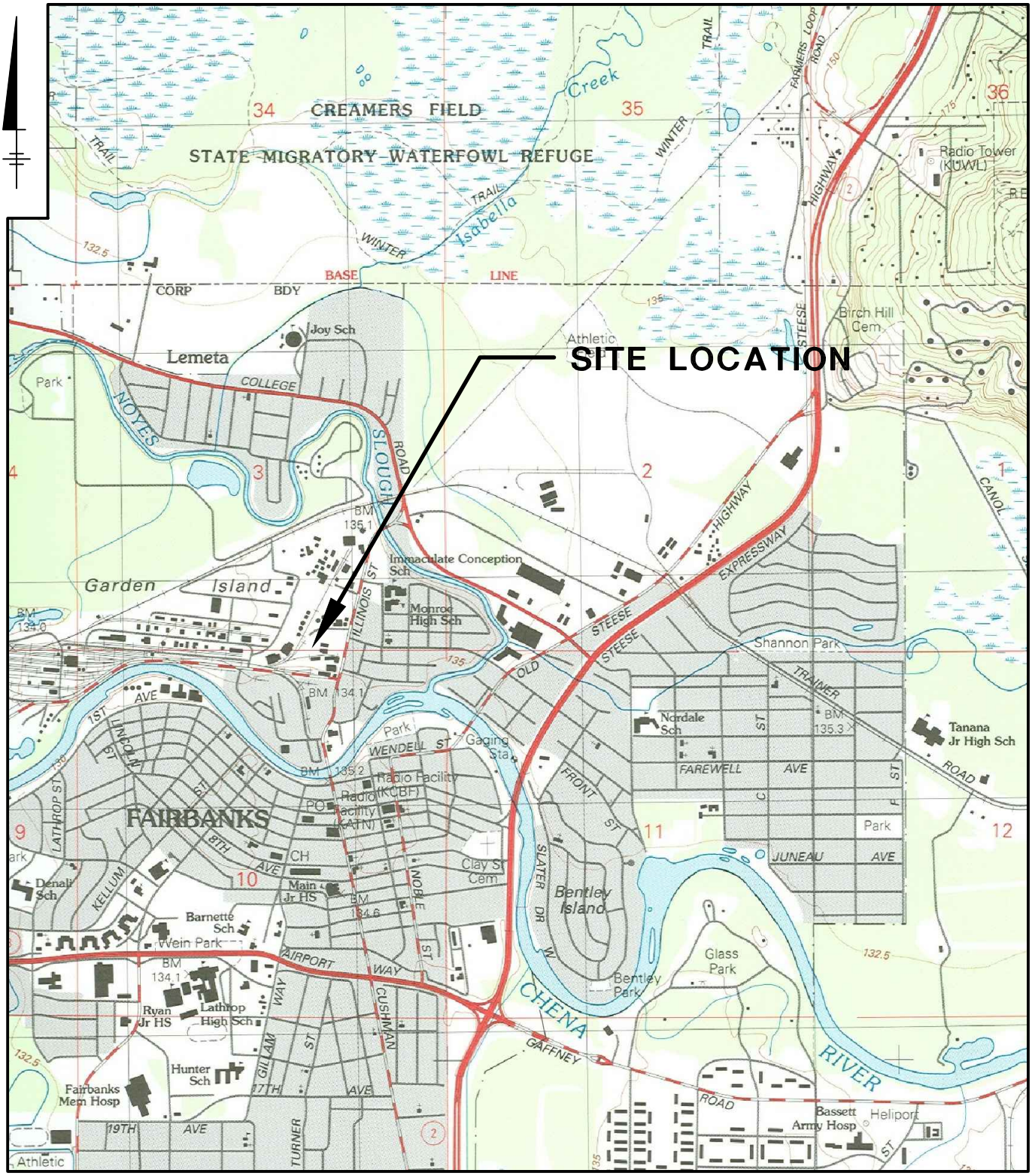
TABLE 4 EXPLANATIONS

REPORTING PERIOD: **4/18/19 - 6/19/19**
POUNDS REMOVED TO DATE: **6,089**
PERIOD POUNDS REMOVED: **419**
PERIOD AVERAGE FLOW RATE (SCFM): **174.0**
PERIOD OPERATIONAL HOURS: **1224.0** **(from the start of continuous operation on 4/15/16)**
PERIOD PERCENT OPERATIONAL: **82%**

Assumptions:
a) One-half the detection limit is used for calculations when concentrations are less than the laboratory detection limits
b) GRO Recovery (lb) = Effluent (ppmv) * (change hours (hr))* Flow (scfm) *(1 mole/379 scf) * (86.2 lbs/mole)* (60 min/hr)
c) Cumulative GRO Recovery = Sum of GRO Recovery
d) Molecular weight of GRO (hexane) is approximately 86 grams per mole (g/mol)

Notes:
NC = Not Calculated
-- = Not Available
[1] Analyzed by EPA method 18 modified.
[2] Analyzed by EPA method 25 modified.
1. System testing period. Continuous startup intitiated on September 10, 2015.
2.Brief system visit to check system is still operating and collecting readings from manifolds and control panels.
3. Due to airline delays, Summa cannisters were not available during October 2, 2015 site visit. Sampling was conducted on October 5, 2015.
4. All operating SVE legs at manifold have cracks at bushing just above valve (except GEI-7). Per field technician (M. MacDaniel) cracks are visible and leaks are audible. Prior to system startup in the Spring 2016, the manifold was repaired.
5. System restart after 1SA16 GWM event. Limited system readings.
6. Due to delays, summa canisters did not arrive. Effluent samples collected on October 26, 2017.
7. Sample collected too early after startup not allowing steady state conditions.
8. Analytical data from September 2018 used to determine mass recovery in 3Q18.

FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE: FAIRBANKS (D-2) SE, AK., 1992, FAIRBANKS NORTH STAR BOROUGH, SECTION: 3, TOWNSHIP: 1S, RANGE: 1W

0 2000' 4000'

APPROXIMATE GRAPHIC SCALE

FORMER UNOCAL BULK TERMINAL 306456
328.5 ILLINOIS ST., FAIRBANKS, ALASKA
2019 FIRST SEMI-ANNUAL O&M REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:TMAPA,FL DIV/GROUP:85 DB:JAR LD:(Opt) PIC:(Opt) PM:M.Strickler TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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RICHARDS, JIM
XREFS: IMAGES: PROJECTNAME: ----
ALASKA.jpg
Fairbanks-SE.jpg

LEGEND

○ Unocal Monitoring Well (GEI) (K)

NOTES:

1. The coordinate system is a local grid. Elevations are State of Alaska TBM "X" NE bolt of fire hydrant on the south side of Phillips Field Road between Illinois Street and Driveway Street. Elevation is 446.59'.
2. Property boundary and well locations provided by "McLane Consulting, Inc.", Field Work Date October 9, 2014.

0 120' 240'

APPROXIMATE GRAPHIC SCALE

FORMER UNOCAL BULK TERMINAL 306456
328.5 ILLINOIS ST., FAIRBANKS, ALASKA
2019 FIRST SEMI-ANNUAL O&M REPORT

SITE MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY:TMA-A, FL DIV/GROUP:85 DB:JAR LD:(Opt) PIC:(Opt) PM:M.Strickler TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\TAMPA\ACT\Chevron\USA\FAIR Site\Chevron 306456\B00455062016\0224.GWR02\O&M REPORT\B00455062016\0224.GWR02O&M REPORTB00455062016 33-01-801.dwg LAYOUT: 2 SAVED: 1/8/2016 10:11 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/8/2016 10:12 AM BY:
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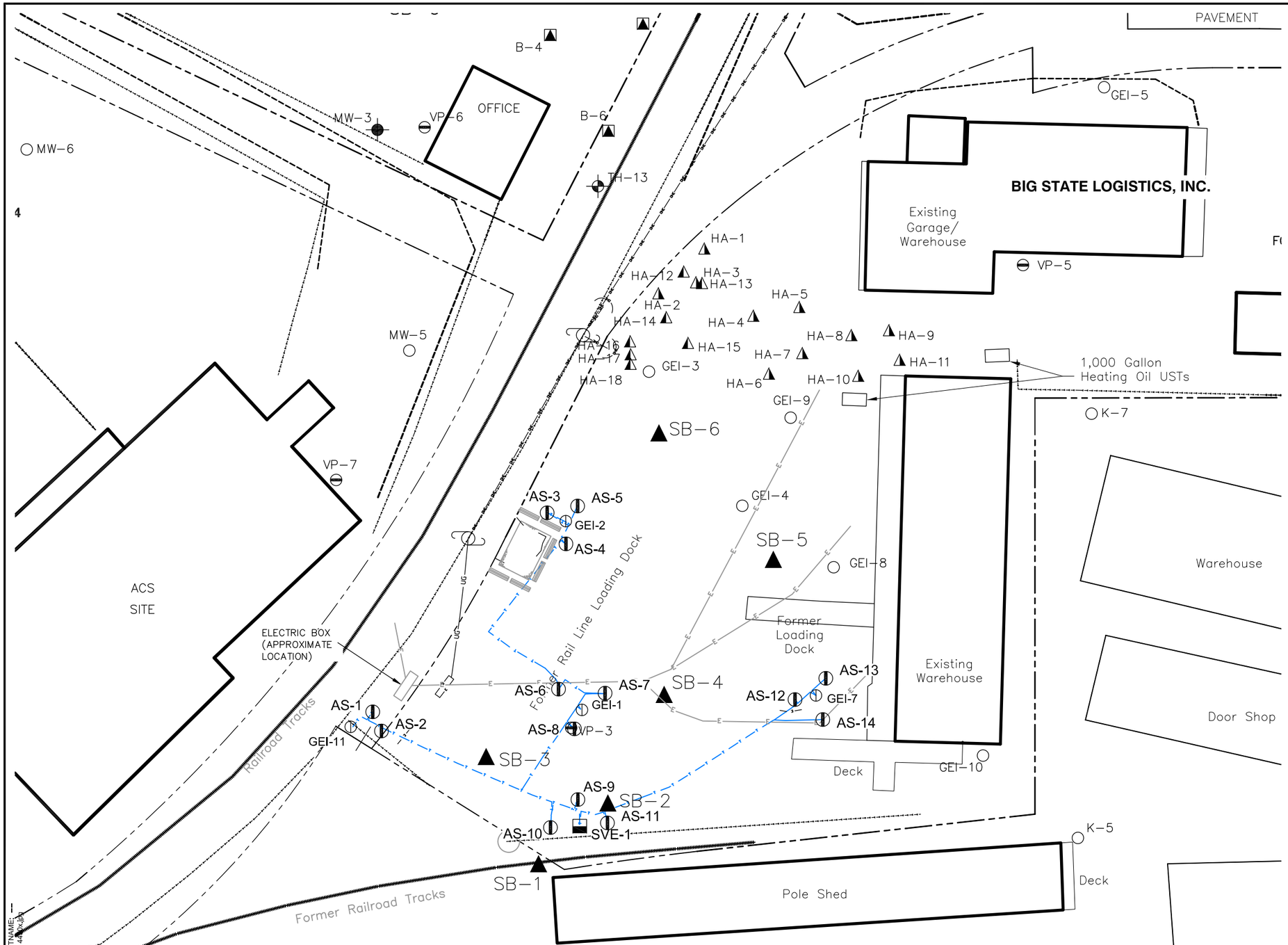


LEGEND

- CHEVRON MONITORING WELL (TH)
- TEXACO MONITORING WELL (AR)
- UNOCAL MONITORING WELL (GEI) (K)
- VAPOR PROBE (VP)
- SOIL BORING
- SOIL BORING (2011)
- HAND AUGER (2012)
- HAND AUGER (2014)
- AS WELL
- SVE WELL (SEE NOTE 1)
- SVE WELL
- EXISTING UNOCAL BUILDING
- FORMER UNOCAL BUILDING
- EXISTING POWER POLE
- PIPE TRENCH (SEE NOTE 6)
- REMEDIATION COMPOUND FENCE
- RAILROAD
- FENCE LINE
- UNDERGROUND ELECTRICAL UTILITY (APPROXIMATE)
- UNDERGROUND ELECTRICAL UTILITY
- OVERHEAD ELECTRIC UTILITY

NOTES:

1. MONITORING WELLS GEI-1, GEI-2, GEI-7 AND GE-11 WILL BE USED AS SVE WELLS.
2. ROI = RADIUS OF INFLUENCE.
3. PROPOSED AS WELL ROI IS 20'.
4. PROPOSED SVE WELL ROI IS 40'.
5. ELECTRICAL BOX, POWER POLE, OVERHEAD LINES, RAILROAD, FENCING, AS AND SVE WELLS AND TRENCHING WERE SURVEYED NOVEMBER 2014 BY MCLANE.
6. PIPE TRENCH WAS VACUUMED CLEARED IN OCTOBER 2014.

0 50' 100'

GRAPHIC SCALE

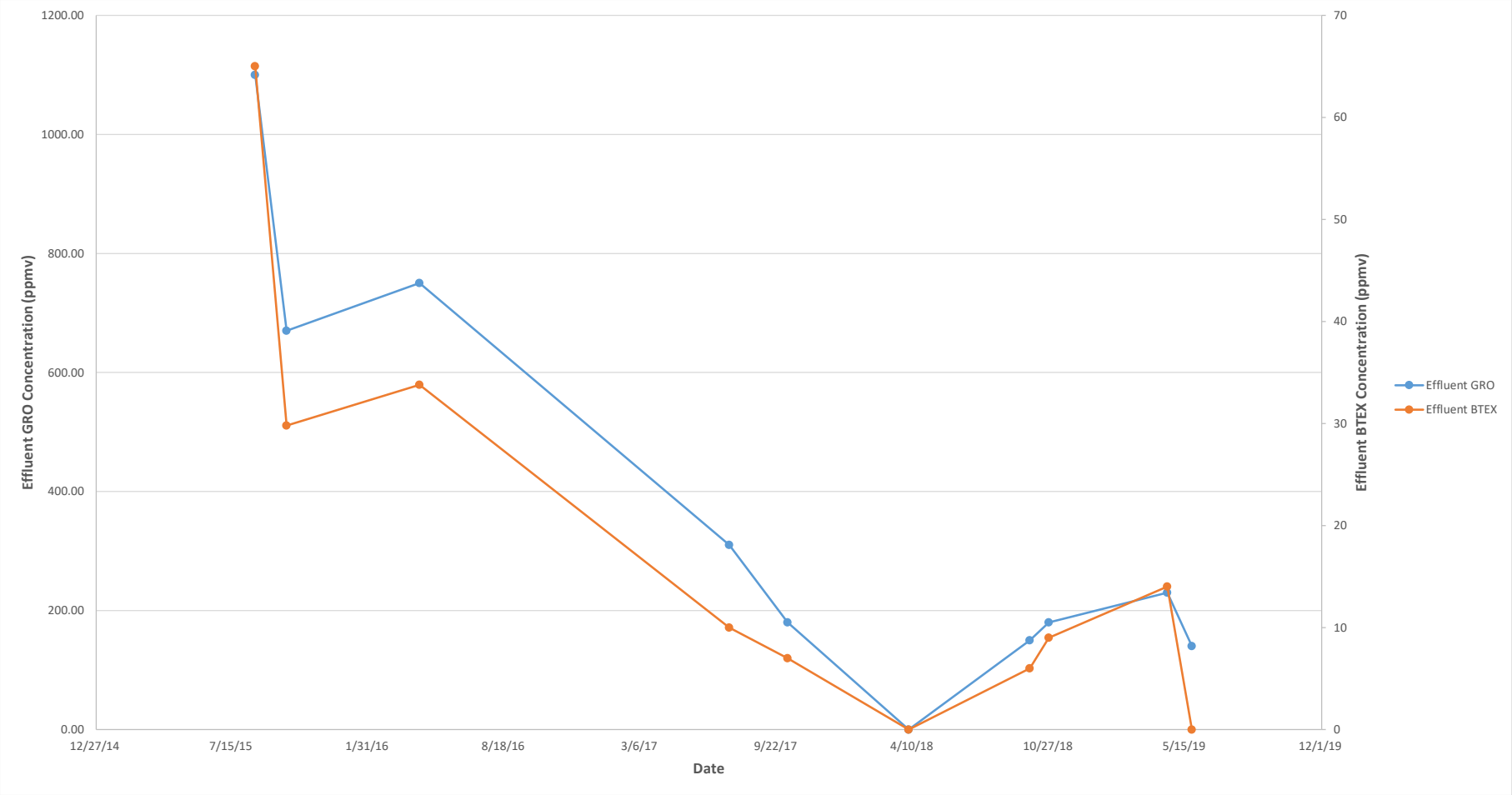
FORMER UNOCAL BULK TERMINAL 306456
328.5 ILLINOIS ST., FAIRBANKS, ALASKA

2019 FIRST SEMI-ANNUAL O&M REPORT

TREATMENT AREA LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3



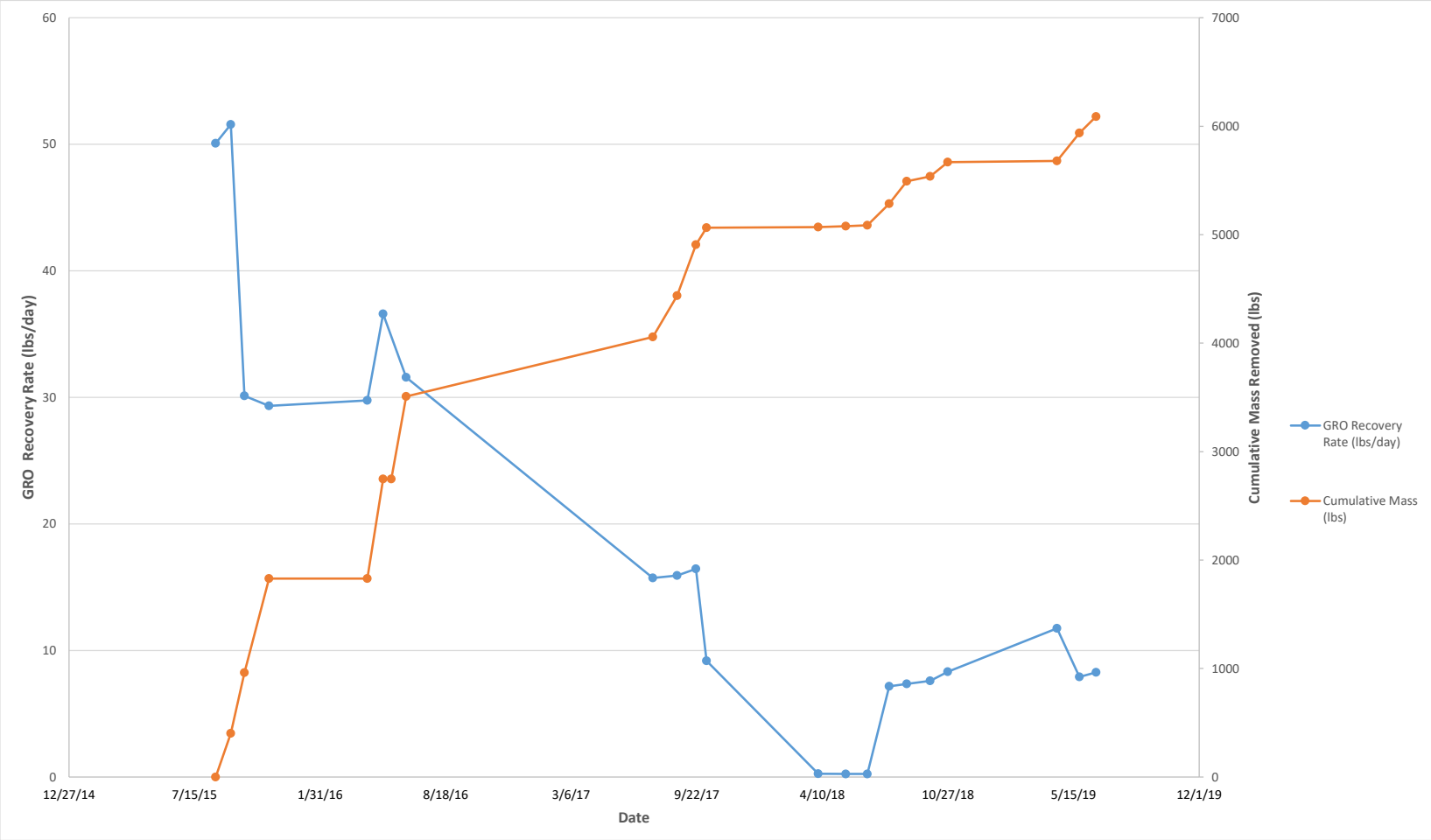
Notes:
GRO = Gasoline range organics
BTEX = Benzene, toluene, ethylbenzene and total xylenes
ppmv = parts per million by volume

CHEVRON FACILITY #306450
328 ½ Illinois Street, in Fairbanks, Alaska

EFFLUENT GRO AND BTEX CONCENTRATIONS

ARCADIS

FIGURE 4



Notes:
GRO = Gasoline range organics
lbs = pounds

CHEVRON FACILITY #306456
328 ½ Illinois Street, Fairbanks, Alaska

GRO MASS REMOVAL

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FIGURE 5

APPENDIX A

O&M Datasheets and Field Notes

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Daily Log

Project Name 306456 Chevron Project Number 306456 Page 1 of 2

Site Location 328.5 Illinois St. Fairbanks, AK Date 4/17/19

Field Personnel David Beaudoin Evan Wyeik

Time	Description of Activities
500	Arrive at airport
600	Flight delay due to plane issue
700	Depart airport on plane
800	Arrive in Fairbanks to pick up rental vehicle and Depart to get equipment
820	Get equipment from Gold Streak
830	Depart to storage unit for supplies and equipment
900	Familiarize with Fairbanks, drive to hospital and key areas to orient ourselves
1030	Arrive on site, contact PM Nicole Monroe to start work
1230	Finish going over system noticed crack in KO tank site gauge assembly
1250	Talk with PM, permission to get supplies to fix fitting.
1300	Depart site for Alaska piping ~~supply~~ supply
1315	Depart for Frontier supply
1340	Depart for Denali industrial supply
1400	Depart for Ferguson Xpress
1420	Depart Ferguson for Fred Myers
1440	Depart Fred Myers for storage unit to piece together new gauge assembly
1630	Depart storage unit and arrive at site
1650	Depart site to storage unit and Home Depot
1720	Depart for site
1830	Make appropriate fixes to gauge assembly
1930	Start system and ensure all gauges, valves, vaccuums are functional, make note of any repairs that need made, call PM for close work and summary of the day

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project Name Chevron 30b456 Project Number 30b456 Page 2 of 2

Site Location 3245 Illinois St. Fairbanks, AK Date 4/18/19

Field Personnel David Beaudoin Evan Wojcik

Time	Description of Activities
700	Check out of hotel
730	Get coffee, go over previous system data before work and sampling
	is done
800	Arrive at site, contact PM for start work
900	Gauge AS wells
1200	Sample using Summa canniste
1230	clean and organize system

SVE/AS SYSTEM
Field Data Sheet

PART A: GENERAL INFORMATION

1. Site Location: 306456 - FAIR Unocal 328 1/2 Illinois Street, Fairbanks, AK
2. Date & Time: 4.17.19 @ 11:30 Start Work (system restart @ 1900)
4.18.19 @ 07:50 → system still running
3. Technician: David Beaudoin, Evan Wojcik
4. Outside Ambient Temperature: 27° Cloudy, 2" Fresh Snow

SVE Blower: FPZ Model K10MS
Elecrical Power: 3 Φ 230 volt

AS Compressor: Busch Rotary Claw
Model #: MM-1142 BP

5. Meter Base Reading: 42563 kwh (4.18.19 / 4.17.19)
6. SVE System up/down upon arrival? UP / DOWN
7. AS System up/down upon arrival? UP / DOWN
8. Heat Exchanger up/down upon arrival? UP / DOWN

4.17.19 Depart site @ 19:45
4.18.19 Return to site @ 07:50 - still running
Gauged System @ 1500 (on 4.18.19) - system still running w/out alarms

9. Knockout Drum on Site: Full _____ Half Full _____ Empty ✓

10. AMBIENT BACKGROUND DATA		Target
CH_4 (%)	0	0
O_2 (%)	20.9	20.9
CO_2 (%)	0 ppm	0
PID (ppm)	0.0	0
LEL	0	0

11. Field Instruments Used: RKI Eagle — Last Calibrated: 4.11.19
Last Calibrated: _____
Last Calibrated: _____

12. ALARM CODES			
		Alarm Status	Comments/Corrective Action?
LAH-101	level switch high (Knockout)	OK	Pumped out water, lowered flow at GEI-7
LAHH-101	Level switch high high (KO)	OK	
LAHH-102	level switch high high Moinsture Separator	OK	
LEL-101	LEL meter High.	OK	
VIT-101	vacuum switch low	OK	
TSH-101	temp switch high (SVE blower)	———	→ Not on HMI
TSH-301	temp switch high (air sparge blower)	OK	

Notes: & Heat Exchanger

PART B: SVE SYSTEM DATA

13. Hour Meter Reading: SVE 9564 At Time: Thursday 4.18.19 0900

14. SVE Header Data

Flow Data	P&ID symbol (Figure 4)	Arrival	Departure	Target Values
Dillution Valve (% open) (7 full turns to 100% open)	See PID	50%	0%	0 to 5
Exhaust Temperature (degrees F)	TI-101	61	64	60 to 90
Total Flow, after dilution valve on HMI (SCFM)	FIT-102	160	175	50 to 150
System Vacuum ("WC)	VI-102	0	0	10 to 30
Exhaust Stack Pressure ("WC)	PI-101	2.41	2.86	0 to 5 percent
Moisture Separator ("WC)	VI-101			10 to 30
Variable Frequency Drive Setting	Not shown	25.6	22.5	0 to 75
Exhaust stack Temp		114.1	119.3	

Gauges Between knockout & Blower:

FIT 101	129 SCFM
TIT 101	113°F
VIT 101	32 in WC

PART C: SVE WELL DATA SHEET

15. Individual SVE Well Differential Pressures and Vacuum - Arrival and Departure Conditions

Well ID	Arrival Differential Pressure ("WC)	Departure Differential Pressure ("WC)	Arrival Vacuum ("wc)	Departure Vacuum ("wc)	Manifold Valve (% Open)	Comments
P&ID symbol	FI-101 to FI-106		VI-101 to VI-106			
GEI-2	**	0.9‡	-15	-10	100	
GEI-11	0*	0	-11	-11	40	
SVE-1	0.70	0.75	-8	-8	70	
GEI-7	0.90	0.92	-6	-10	40	
GEI-1	0.85	0.80	-14	-14	20	
Target Values	0.05 to 30		10 to 30			

Exhaust stack is 3" and SVE wells are 2" diameter

16. Vapor extraction gas data

Group 1 operating - AS-1, AS-2; GEI-11

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	1	14.5	157	10
GEI-11	0	19.2	88	10
SVE-1	3	16.1	152	8
GEI-7	0	20.0	36	7
GEI-1	0	19.9	29	14
Effluent	1	17.7	84	—
Target	0.0	20.9	0 to 200	—

Group 2 operating -AS-3, AS-4, AS-5; GEI-2

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	1	15.1	160	10
GEI-11	1	19.2	77	10
SVE-1	3	13.7	152	8
GEI-7	0	20.0	37	7
GEI-1	0	19.8	33	14
Effluent	1	17.6	92	—
Target	0.0	20.9	0 to 200	—

Group 3 operating - AS-6, AS-7, AS-8; GEI-1

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	2	8.2	306	10
GEI-11	2	18.6	151	10
SVE-1	2	16.4	108	8
GEI-7	0	20.4	29	6
GEI-1	0	20.4	22	12
Effluent	1	17.5	96	—
Target	0.0	20.9	0 to 200	—

Group 4 operating -AS-9, AS-10, AS-11; SVE-1

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	1	15.0	126	10
GEI-11	0	19.8	70	10
SVE-1	4	16.8	133	8
GEI-7	0	20.5	28	7
GEI-1	0	20.5	26	14
Effluent	1	18.0	95	–
Target	0.0	20.9	0 to 200	—

Group 5 operating -AS-12, AS-13, AS-14; GEI-7

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	1	14.7	173	10
GEI-11	1	19.1	84	10
SVE-1	4	15.4	155	8
GEI-7	0	20.0	37	7
GEI-1	0	19.9	34	14
Effluent	1	17.6	86	–
Target	0.0	20.9	0 to 200	—

Note: Group 3 Operating During Data Collection (under Item 15 above)

17. SUMMA SAMPLE INFORMATION

Effluent Sample ID:	Effluent-A1-190418
Summa Canister #:	1343
Date & Time:	4.18.19 @ 1155
Initial Vac (inHg):	-29 in Hg
Final Vac (inHg):	-6 in Hg
AS Group in Operation:	1

Backup Sample
Effluent-A2-190418
1348
4.18.19 @ 1200
-30 in Hg
-6 in Hg
1

Notes
** GEI-2: Differential Pressure rises from 0.4 inWC to 1 inWC, then rapidly drops & repeats
‡ GEI-2: Differential Pressure steady upon Departure
* GEI-11: Differential Pressure = 0 (No Flow)

Part D: AS HEADER DATA SHEET

18. Hour Meter Readings

Hour Meter Reading		Time
AS Compressor:	8404	1025
AS Heat Exchanger:	8391	1025

19. AS Group Status

Group ID	Associated AS - Wells	Corresponding Solenoid Valve IDs	Changes
Group #1	AS-1, AS-2	309, 308	NA
Group #2	AS-3, AS-4, AS-5	307, 306, 305	NA
Group #3	AS-6, AS-7, AS-8	304, 303, 302	NA
Group #4	AS-9, AS-10, AS-11	317, 316, 315	NA
Group #5	AS-12, AS-13, AS-14	314, 313, 312	NA

20. AS Header Information

May Gauge Above Air Sparge Manifold

Flow Data	P&ID Symbol	Arrival		Departure		Target
Total AS Flow ("WC)	FI-301	1		1		Not Provided
Variable Frequency Drive Setting	on HMI	62.5%, 35.4 Hz, 23 amps		63.6%		↓
Temp - upstream of heat exchanger (deg F)	TI-201	55		152		
Temp - downstream of heat exchanger (deg F)	TI-301	53		60		
System Pressure (PSI) - before Heat Exch.	PI-201	10		10.5		↓
System Pressure (PSI) - after Heat Exch.	PI-301	@ HMI	@ gauge	@ HMI	@ gauge	5 to 15

PART E: AS WELL DATA SHEET

21. AS Wells Arrival Conditions:

Air Sparge Well	Manifold Gate Valve % Open	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	Manifold Gate Valve % Open
P&ID		PI-302 to 310	Quick connect	rotameters			PI-311 to 318	Quick connect	rotameters		
AS-1	~12	8.5	NM*	18	1702	AS-10	4	NM	11	2853	~12
AS-2	~12	7.5	NM	18	1658	AS-11	<1	NM	11	2873	~12
AS-3	~12	3	NM	13	1745	AS-12	7	NM	12	1777	~12
AS-4	~12	4.5	NM	13	1774	AS-13	5	NM	12	1809	~12
AS-5	~12	4.5	NM	13	1777	AS-14	6	NM	12	1811	~12
AS-6	~12	6	NM	18	2578		5 to 10	5 to 10	10 to 15		
AS-7	~12	12	NM	X	2513						
AS-8	~12	9	NM	18	2515						
AS-9	~12	7.5	NM	11	2853						
Target		5 to 10	5 to 10	10 to 15							

*NM = Not Measured

* float is stuck - Rotameter Needs to be cleaned

22. AS Wells Departure Conditions:

Air Sparge Well	Manifold Gate Valve % Open	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours
P&ID		PI-302 to 310	Quick connect	rotameters			PI-311 to 318	Quick connect	rotameters	
AS-1	NM	NM	NM	NM	1707	AS-10	NM	NM	NM	2854
AS-2	↓	↓	↓	↓	1659	AS-11	NM	↓	NM	2874
AS-3					1747	AS-12	13		7	1778
AS-4					1775	AS-13	13		5	1810
AS-5					1778	AS-14	12		5.5	1811
AS-6					2515		5 to 10	5 to 10	10 to 15	
AS-7					2515					
AS-8					2514					
AS-9					2855					
Target		5 to 10	5 to 10	10 to 15						

#NM = Not Measured

PART F: MAINTENANCE RECORD

MONTHLY

	Yes	No	Action
Any leaks?	✓		Repair knockout Interlock shut down PVC assembly
Any rattles?		✓	
Excessive noise?		✓	
Indicator lights out?		✓	
Abnormal wear & tear?		✓	
Blower oil low? (Compressor)	✓		little low - looks like it is due to be changed
Heat trace circuit breakers all on?	✓		
Any faulty gauges?		✓	
Other?	—	—	—

QUARTERLY

	Yes	No	Date Last Performed	Action
Air sparge compressor oil changed?		✓	unknown	
Linkage and bearings greased?		✓	unknown	
Inspected/cleaned flow gauges?		✓	unknown	inspected only
Air sparge intake filter changed?		✓	unknown	inspected
SVE intake filter changed?		✓	unknown	
Dilution value intake filter changed?		✓	unknown	

PART G: TREATMENT COMPOUND

MONTHLY

	Yes	No	Action
Fence/Gate inspected?	✓		
Doors/Locks inspected?	✓		
Emergency sign posted?	✓		
Fire extingurisher on site?	✓		
Other?	—	—	

PART H: ADDITIONAL COMMENTS

Give details of system status upon arrival: System Not Operational - down for 2018/2019 Winter

PART G: PLANNED ACTIVITIES FOR NEXT TRIP

Air Sparge Compressor Oil Change

Air Filter Inspection & change

Summa Canister Field Test Data/Chain of Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____ Group # _____ For Eurofins Lancaster Laboratories Environmental use only Sample # _____ Bottle Order (SCR) # 222333

Client Information

Client: Chevron — Account #:

Project Name/#: FAIR Unocal #306456

Project Manager: Greg Montgomery — P.O. #: B00455006

Sampler: M. MacDaniel / Joe Latham — Quote #:

Name of state where samples were collected: Alaska

Turnaround Time Requested (TAT) (circle one)

(Standard) Rush (specify) _____

Data Package Required? (Yes) No

EDD Required? (Yes) No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	25	25		
Maximum				
Minimum				

Analyses Requested

☒ BTEX ☐ MTBE

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search	
Effluent-A-040318	4/3/18 1215	4/3/18 1215	-27	-5				1302	1			X	X				
Back-up for 1302	4/3/18 1220	4/3/18 1220	-28	-5				1318	1			X	X				

Instructions/QC Requirements & Comments

EPA 25 (check one)

☐ C1 - C4 ☒ C2 - C10

☐ C1 - C10 ☐ C4 - C10 (GRO)

☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
	3/27/18						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:

306456.
5.24.19

SVE/AS SYSTEM
Field Data Sheet

PART A: GENERAL INFORMATION

1. Site Location: 306456 - FAIR Unocal 328 1/2 Illinois Street, Fairbanks, AK
2. Date & Time: 5.24.19 0900 Arrive ~~Off~~ @
3. Technician: E. Wojcik, D. Beardsley
4. Outside Ambient Temperature: 52°F

SVE Blower: FPZ Model K10MS
Elecrical Power: 3 Φ 230 volt
AS Compressor: Busch Rotary Claw
Model #: MM-1142 BP

5. Meter Base Reading: 47052 kwh 6.943 kW
6. SVE System up/down upon arrival? (UP) / DOWN
7. AS System up/down upon arrival? (UP) / DOWN
8. Heat Exchanger up/down upon arrival? (UP) / DOWN

9. Knockout Drum on Site: Full _____ Half Full _____ Empty ✓

10. AMBIENT BACKGROUND DATA		Target
CH_4 (%)	0.00	0
O_2 (%)	20.9	20.9
~~CO (%)~~ CO ppm	0	0
PID (ppm)	0	0
LEL %	0	0

11. Field Instruments Used: RKI Eagle Last Calibrated: _____
Last Calibrated: _____
Last Calibrated: _____

12. ALARM CODES			
		Alarm Status	Comments/Corrective Action?
LAH-101	level switch high (Knockout)	~~Y~~	Pumped out water, lowered flow at GEI-7
LAHH-101	Level switch high high (KO)	ok ~~Y~~	
LAHH-102	level switch high high Moinsture Separator	OK ~~N~~	
LEL-101	LEL meter High.	ok ~~N~~	
VIT-101	vacuum switch low	OK ~~N~~	
TSH-101	temp switch high (SVE blower)	~~ok N~~	→ Not on HMI
TSH-301	temp switch high (~~air sparge blower~~)	OK ~~N~~	

Notes: ↑ Heat Exchanger

PART B: SVE SYSTEM DATA

13. Hour Meter Reading: SVE 14,350 At Time: Friday 5.24.19 09:39

14. SVE Header Data

Flow Data	P&ID symbol (Figure 4)	Arrival	Departure	Target Values
Dillution Valve (% open) (7 full turns to 100% open)	See PID	0%		0 to 5
Exhaust Temperature (degrees F)	TI-101	71		60 to 90
Total Flow, after dilution valve on HMI (SCFM)	FIT-102	177		50 to 150
System Vacuum ("WC)	VI-102	16		10 to 30
Exhaust Stack Pressure ("WC)	PI-101	1		0 to 5 percent
Moisture Separator ("WC)	VI-101	16		10 to 30
Variable Frequency Drive Setting	Not shown	21.6% 11.2 A 25.6 Hz		0 to 75

306456

5.24.19

Part D: AS HEADER DATA SHEET

18. Hour Meter Readings

Hour Meter Reading		Time
AS Compressor:	9189	0948
AS Heat Exchanger:	9176	0948

19. AS Group Status

Group ID	Associated AS - Wells	Corresponding Solenoid Valve IDs	Changes
Group #1	AS-1, AS-2	309, 308	—
Group #2	AS-3, AS-4, AS-5	307, 306, 305	—
Group #3	AS-6, AS-7, AS-8	304, 303, 302	—
Group #4	AS-9, AS-10, AS-11	317, 316, 315	—
Group #5	AS-12, AS-13, AS-14	314, 313, 312	—

20. AS Header Information

Flow Data	P&ID Symbol	Arrival		Departure		Target
Total AS Flow ("WC)	FI-301	1		1		
Variable Frequency Drive Setting		65.5		65.5		
Temp - upstream of heat exchanger (deg F)	TI-201	65		65		
Temp - downstream of heat exchanger (deg F)	TI-301	70		70		
System Pressure (PSI) - before Heat Exch.	PI-201	11		11		
System Pressure (PSI) - after Heat Exch.	PI-301	10 @ HMI	6 @ gauge	@ HMI	@ gauge	5 to 15

PART E: AS WELL DATA SHEET

21. AS Wells Arrival Conditions:

Air Sparge Well	Manifold Gate Valve % Open	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	% Open
P&ID		PI-302 to 310	Quick connect	rotameters			PI-311 to 318	Quick connect	rotameters		
AS-1	12	8	4.5	19	1865	AS-10	6.5	3	12	3017	12
AS-2	12	7	4.5	18.5	1922	AS-11	3	*	11	3037	12
AS-3	12	5.5	4	17	1910	AS-12	5	3.5	13	1941	12
AS-4	12	5	4.5	12	1938	AS-13	6	*	13	1973	12
AS-5	12	4	*	14	1941	AS-14	5.5	*	12	1975	12
AS-6	12	6	5	13	2678		5 to 10	5 to 10	10 to 15		
AS-7	12	5.5	5	16	2678						
AS-8	12	8	6	10	2677						
AS-9	12	10.5	8	13	3018						
Target		5 to 10	5 to 10	10 to 15							

Notes: * unaccessible

leaking at base of air sparge well plug cap coupling

22. AS Wells Departure Conditions:

Air Sparge Well	Manifold Gate Valve % Open	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Wellhead Pressure (PSI)	Flow (CFM)	Hours
P&ID		PI-302 to 310	Quick connect	rotameters			PI-311 to 318	Quick connect	rotameters	
AS-1	Not Gauged	Not Measured	NM*	NM*	1867	AS-10	NM*	NM*	NM*	3017
AS-2					1923	AS-11				3037
AS-3					1910	AS-12				1941
AS-4					1930	AS-13				1973
AS-5					1941	AS-14				1975
AS-6					2670		5 to 10	5 to 10	10 to 15	
AS-7					2678					
AS-8					2678					
AS-9					3018					
Target		5 to 10	5 to 10	10 to 15						

Notes: * NM = Not Measured

306456
5.24.19

PART C: SVE WELL DATA SHEET

15. Individual SVE Well Differential Pressures and Vacuum - Arrival and Departure Conditions

Well ID	Arrival Differential Pressure ("WC)	Departure Differential Pressure ("WC)	Arrival Vacuum ("wc)	Departure Vacuum ("wc)	Manifold Valve (% Open)	Comments
P&ID symbol	FI-101 to FI-106		VI-101 to VI-106			
GEI-2	0.4		-8		100	
GEI-11	0.06		-8		40	
SVE-1	0.60		-6		70	
GEI-7	0.80		-5		40	
GEI-1	0.38		-10		20	
Target Values	0.05 to 30		10 to 30			

Exhaust stack is 3" and SVE wells are 2" diameter

16. Vapor extraction gas data

Group 1 operating - AS-1, AS-2; GEI-11

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	0	19.1	64	–
GEI-11	0	20.1	96	5.8
SVE-1	1	19.1	113	–
GEI-7	0	20.9	11	– 0.0
GEI-1	0	20.9	6	–
Effluent	0	20.4	57	–
Target	0.0	20.9	0 to 200	

Group 2 operating -AS-3, AS-4, AS-5; GEI-2

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	0	@ 19.4	99	9.6
GEI-11	0	20.4	60	–
SVE-1	0	19.4	71	–
GEI-7	0	20.9	9	–
GEI-1	0	20.9	4	–
Effluent	0	20.0	43	–
Target	0.0	20.9	0 to 200	

Group 5 . AS-12, 13, 14 . GEI-)

Group 3 operating - AS-6, AS-7, AS-8; GEI-1

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	0	19.3	52	–
GEI-11	0	20.4	69	–
SVE-1	0	19.4	77	–
GEI-7	0	20.9	10	–
GEI-1	0	20.9	5	0.5
Effluent	0	20.1	35	–
Target	0.0	20.9	0 to 200	

Group 4 . AS-9, 10, 11. SVE-1

~~Group 4 operating -AS-9, AS-10, AS-11; SVE-1~~

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	0	19.3	54	–
GEI-11	0	20.1	69	–
SVE-1	0	19.7	83	0.0 – GEI-7
GEI-7	0	20.9	8	–
GEI-1	0	20.9	5	–
Effluent	0	20.0	42	–
Target	0.0	20.9	0 to 200	

~~Group 5 operating -AS-12, AS-13, AS-14; GEI-7~~

Well ID	LEL (%)	Oxygen (%)	PID (ppmv)	Well head Vac (inWC)
GEI-2	0	19.3	48	–
GEI-11	0	20.2	69	–
SVE-1	0	19.5	82	–
~~GEI-7~~	0	20.9	18	~~0.5~~ – SVE1 increasable
GEI-1	0	20.9	5	–
Effluent	0	20.1	37	–
Target	0.0	20.9	0 to 200	

17. SUMMA SAMPLE INFORMATION

Effluent Sample ID:	Effluent - A1 - 190524	Effluent - A2 - 190524
Summa Canister #:	1313	1167
Date & Time:	5/24/19 @ 1158	5/24/19 @ 1200
Initial Vac (inHg):	-30	-30
Final Vac (inHg):	-5	-5
AS Group in Operation:	1	1

306456
5.24.19

PART F: MAINTENANCE RECORD

MONTHLY

	Yes	No	Action
Any leaks?		✓	
Any rattles?		✓	
Excessive noise?		✓	
Indicator lights out?		✓	
Abnormal wear & tear?		✓	
Blower oil low?	✓		Need to order proper oil
Heat trace circuit breakers all on?		✓	
Any faulty gauges?		✓	
Other?			

QUARTERLY

	Yes	No	Date Last Performed	Action
Air sparge compressor oil changed?		✓	?	
Linkage and bearings greased?		✓	?	changed
Inspected/cleaned flow gauges?	✓			inspected
Air sparge intake filter changed?	✓		?	filter ~~inspected~~ ok
SVE intake filter changed?		✓	?	inspected ok
Dilution value intake filter changed?	✓			

PART G: TREATMENT COMPOUND

MONTHLY	Yes	No	Action
Fence/Gate inspected?	✓		
Doors/Locks inspected?	✓		
Emergency sign posted?	✓		
Fire extingurisher on site?	✓		
Other?			

PART H: ADDITIONAL COMMENTS

Give details of system status upon arrival: Operating Normally

PART G: PLANNED ACTIVITIES FOR NEXT TRIP

SVE dilution Valve filter change

Air Sparge Compressor Oil Change

Gauge System

CEMREC Site ID: 306456
Date: 6/19/19

ARCADIS Design & Consultancy for natural and built assets

SVE/AS SYSTEM
Field Data Sheet

PART A: GENERAL INFORMATION

1. Site Location: 306456 - FAIR Unocal, 328 1/2 Illinois Street, Fairbanks, AK
2. Date & Time: 6/19/19 1550
3. Technician: E. Wyeth / D. Beaudoin
4. Outside Ambient Temperature: 80° F

SVE Blower: FPZ Model K10MS
Elecrical Power: 3 Φ 230 volt

AS Compressor: Busch Rotary Claw
Model #: MM-1142 BP

5. Meter Base Reading: 49971 kwh
6. SVE System up/down upon arrival? Down
7. AS System up/down upon arrival? Down
8. Heat Exchanger up/down upon arrival? Down

9. Knockout Drum on Site: Full ____ Half Full ____ Empty ✓

10. AMBIENT BACKGROUND DATA		Target
CH_4 (%)	0.0	0
O_2 (%)	20.9	20.9
CO ppm	0	0
PID (ppm)	0	0
LEL (%)	0	0

11. Field Instruments Used: RKI Eagle Last Calibrated: 6/11/19

12. ALARM CODES			
		Alarm Status	Comments/Corrective Action?
LAH-101	level switch high (Knockout)	ok	–
LAHH-101	Level switch high high (KO)	ok	–
LAHH-102	level switch high high Moinsture Separator	ok	–
LEL-101	LEL meter High.	ok	–
VIT-101	vacuum switch low	ok	–
TSH-101	temp switch high (SVE blower)	ok	–
TSH-301	temp switch high (heat exchanger)	ok	–

PART B: SVE SYSTEM DATA

13. Hour Meter Reading: SVE 10788 At Time: 1600

14. SVE Header Data

Flow Data	P&ID symbol (Figure 4)	Arrival	Departure	Target Values
Dillution Valve (% open) (7 full turns to 100% open)	See PID	0%	0%	0 to 5
Exhaust Temperature (degrees F)	TI-101	86°F	86	60 to 90
Total Flow (SCFM)	FIT-102	185	185	50 to 150
System Vacuum ("WC)	VI-102	1	1	10 to 30
Exhaust Stack Pressure ("WC)	~~PI-101~~	—	—	~~0 to 5 percent~~
Moisture Separator ("WC)	VI-101	17	17	10 to 30
Variable Frequency Drive Setting	Not shown	22.6%	~~23.8~~ 26.8	0 to 75

CEMREC Site ID: 306456
Date: 6/19/19

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PART C: SVE WELL DATA SHEET

15. Individual SVE Well Differential Pressures and Vacuum - Arrival and Departure Conditions

Well ID	Arrival Differential Pressure ("WC)	Departure Differential Pressure ("WC)	Arrival Vacuum ("wc)	Departure Vacuum ("wc)	Comments
P&ID symbol	FI-101 to FI-106		VI-101 to VI-106		
GEI-2 ~~SVE 1*~~	10	0.5	10	0.5	
GEI-11 ~~SVE 2*~~	9	0.15	10	0.15	
SVE-1 ~~SVE 3*~~	9	0.8	9	0.8	
GEI-4 ~~SVE 4*~~	9	>1	9	>1	
GEI-1 ~~SVE 5*~~	9	0.3	16	0.3	
~~SVE 6*~~	—	—	—	—	—
Target Values	0.05 to 30		10 to 30		

Exhaust stack is 3" and SVE wells are 2" diameter

16. Vapor extraction gas data

Group 1 operating - AS-1, AS-2, ~~AS-18~~

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
GEI-2 ~~SVE 1*~~	0	18.1	48
GEI-11 ~~SVE 2*~~	0	17.2	67
SVE-1 ~~SVE 3*~~	0	17.1	81
GEI-4 ~~SVE 4*~~	0	20.4	35
GEI-1 ~~SVE 5*~~	0	20.7	18
~~SVE 6*~~			
Effluent	0	18.6	41
Target	0.0	20.9	0 to 200

AS4, AS5

Group 2 operating -AS-3, ~~AS-6, AS-10~~

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
GEI-2 ~~SVE 1*~~	0	17.6	48
GEI-11 ~~SVE 2*~~	0	17.6	51
SVE-1 ~~SVE 3*~~	0	17.1	75
GEI-4 ~~SVE 4*~~	0	20.3	32
GEI-1 ~~SVE 5*~~	0	20.6	8
~~SVE 6*~~			
Effluent	0	18.4	39
Target	0.0	20.9	0 to 200

AS-6

Group 3 operating - ~~AS-4~~, AS-7, AS-8

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
GEI-2 ~~SVE 1*~~	0	17.4	55
GEI-11 ~~SVE 2*~~	0	17.3	71
SVE-1 ~~SVE 3*~~	0	17.1	98
GEI-4 ~~SVE 4*~~	0	20.1	34
GEI-1 ~~SVE 5*~~	0	20.3	19
~~SVE 6*~~			
Effluent	0	18.4	43
Target	0.0	20.9	0 to 200

AS9, AS10, AS11

Group 4 operating ~~AS-5, AS-9, AS-13~~

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
GEI-2 ~~SVE 1*~~	0	17.8	56
GEI-11 ~~SVE 2*~~	0	17.1	80
SVE-1 ~~SVE 3*~~	0	17.0	93
GEI-4 ~~SVE 4*~~	0	20.4	10
GEI-1 ~~SVE 5*~~	0	20.6	6
~~SVE 6*~~			
Effluent	0	18.6	43
Target	0.0	20.9	0 to 200

AS12, AS13, AS14

Group 5 operating ~~AS-11, AS-12, AS-14~~

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
GEI-2 ~~SVE 1*~~	0	17.9	63
GEI-11 ~~SVE 2*~~	0	17.2	55
SVE-1 ~~SVE 3*~~	0	16.9	80
GEI-4 ~~SVE 4*~~	0	20.6	27
GEI-1 ~~SVE 5*~~	0	20.7	14
~~SVE 6*~~			
Effluent	0	18.5	38
Target	0.0	20.9	0 to 200

~~Group 6 operating -AS-15, AS-16, AS-17~~

Well ID	Methane (%)	Oxygen (%)	PID (ppmv)
SVE 1*			
SVE 2*			
SVE 3*			
SVE 4*			
SVE 5*			
SVE 6*			
Effluent			
Target	0.0	20.9	0 to 200

17. SUMMA SAMPLE INFORMATION

Effluent Sample ID:
Summa Canister #:
Date & Time:
Initial Vac (inHg):
Final Vac (inHg):
AS Group in Operation:

No sample collected

CEMREC Site ID: 306456
Date: 6/15/19

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Part D: AS HEADER DATA SHEET

18. Hour Meter Readings

Hour Meter Reading		Time
AS Compressor:	9624	1600
AS Heat Exchanger:	9613	1608

19. AS Group Status

Group ID	Associated AS - Wells	Corresponding Solenoid Valve IDs	Changes
Group #1	AS-1, AS-2	309, 308	—
Group #2	AS-3, AS-4, AS-5	307, 306, 305	—
Group #3	AS-6, AS-7, AS-8	304, 303, 302	—
Group #4	AS-9, AS-10, AS-11	317, 316, 315	—
Group #5	AS-12, AS-13, AS-14	314, 313, 312	—

20. AS Header Information

Flow Data	P&ID Symbol	Arrival	Departure	Target
Total AS Flow ("WC)	FI-301	1	1	0 to 30
Variable Frequency Drive Setting		64	64	50 to 100
Temp - upstream of heat exchanger (deg F)	TI-201	82	82	100 to 160
Temp - downstream of heat exchanger (deg F)	TI-301	85	85	40 to 70
System Pressure (PSI) - before Heat Exch.	PI-201	10	10	5 to 15
System Pressure (PSI) - after Heat Exch.	PI-301	10	10	5 to 15

PART E: AS WELL DATA SHEET

21. AS Wells Arrival Conditions:

Air Sparge Well	Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Flow (CFM)	Hours
P&ID	PI-302 to 310	rotameters			PI-311 to 318	rotameters	
AS-1 (SV309)	9	20	1958	AS-10 (SV316)	6	13	3108
AS-2 (SV308)	9	20	1914	AS-11 (SV315)	3	13	3128
AS-3 (SV307)	5	14	2001	AS-12 (SV314)	8	13	2032
AS-4 (SV306)	5	14	2029	AS-12 (SV313)	6	13	2064
AS-5 (SV305)	3	14	2032	AS-14 (SV312)	6	12	2066
AS-6 (SV304)	5	6	2769				
AS-7 (SV303)	4	11	2769				
AS-8 (SV302)	5	9	2769				
AS-9 (SV317)	10	13	3109				
Target	5 to 10	10 to 15			5 to 10	10 to 15	

22. AS Wells Departure Conditions:

Air Sparge Well	Pressure (PSI)	Flow (CFM)	Hours	Air Sparge Well	Pressure (PSI)	Flow (CFM)	Hours
P&ID	PI-302 to 310	rotameters			PI-311 to 318	rotameters	
P&ID	NM	NM	NR	AS-10 (SV316)	NM	NM	NR
AS-1 (SV309)	↓	↓	↓	AS-11 (SV315)	↓	↓	↓
AS-2 (SV308)	↓	↓	↓	AS-12 (SV314)	↓	↓	↓
AS-3 (SV307)	↓	↓	↓	AS-12 (SV313)	↓	↓	↓
AS-4 (SV306)	↓	↓	↓	AS-14 (SV312)	↓	↓	↓
AS-5 (SV305)	↓	↓	↓		↓	↓	↓
AS-6 (SV304)	↓	↓	↓		↓	↓	↓
AS-7 (SV303)	↓	↓	↓		↓	↓	↓
AS-8 (SV302)	↓	↓	↓		↓	↓	↓
AS-9 (SV317)	5 to 10	10 to 15			5 to 10	10 to 15	

Notes: NM = Not Measured
NR = Not Recorded

CEMREC Site ID: 306456
Date: 6/19/19

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PART F: MAINTENANCE RECORD

MONTHLY

	Yes	No	Action
Any leaks?		✓	
Any rattles?		✓	
Excessive noise?		✓	
Indicator lights out?		✓	
Abnormal wear & tear?		✓	
Blower oil low?		✓	
Heat trace circuit breakers all on?		✓	
Any faulty gauges?		✓	
Other?		—	

QUARTERLY

	Yes	No	Date Last Performed	Action
Air sparge compressor oil changed?	✓		6/19/19	
Linkage and bearings greased?		✓		
Inspected/cleaned flow gauges?	✓			
Air sparge intake filter changed?	✓			
SVE intake filter changed?	✓			
Dilution value intake filter changed?	✓			

PART G: TREATMENT COMPOUND

MONTHLY

	Yes	No	Action
Fence/Gate inspected?	✓		
Doors/Locks inspected?	✓		
Emergency sign posted?	✓		
Fire extingurisher on site?	✓		
Other?	—		

PART H: ADDITIONAL COMMENTS

Give details of system status upon arrival: System down, unexplained e-stop alarm

PART G: PLANNED ACTIVITIES FOR NEXT TRIP

Standard O&M - Effluent Vapor Samples

APPENDIX B

Laboratory Analytical Reports, Chains-of-Custody and Data Checklists

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Chevron
L4310
6001 Bollinger Canyon Road
San Ramon CA 94583

Report Date: April 28, 2019 13:38

Project: 306456

Account #: 11964
Group Number: 2040059
SDG: LSV44
PO Number: 0015309139
Release Number: HETRICK
State of Sample Origin: AK

Electronic Copy To	Arcadis	Attn: Melissa Blanchette
Electronic Copy To	Arcadis	Attn: Arti Patel
Electronic Copy To	Arcadis	Attn: Nicole Monroe

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

To view our laboratory's current scopes of accreditation please go to https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/ . Historical copies may be requested through your project manager.

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
Effluent-A1-190418 Air	04/18/2019 11:55 - 04/18/2019 11:55	1039882
Effluent-A2-190418 Air	04/18/2019 12:00 - 04/18/2019 12:00	1039883

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **Effluent-A1-190418 Air**
Facility# 306456 SUMMA CAN# 1373
328.5 Illinois St. - Fairbanks, AK

Chevron
ELLE Sample #: AQ 1039882
ELLE Group #: 2040059
Matrix: Air

Project Name: **306456**

Submittal Date/Time: 04/20/2019 09:20
Collection Date/Time: 04/18/2019 11:55 through 04/18/2019 11:55
SDG#: LSV44-01

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		**ppm(v)**	**ppm(v)**	**mg/m3**	**mg/m3**	
07090	Benzene	71-43-2	2 J	1	6 J	3	2
07090	C2-C10 Hydrocarbons as hexane	n.a.	230	10	830	35	2
07090	Ethylbenzene	100-41-4	N.D.	0.8	N.D.	3	2
07090	Toluene	108-88-3	6	2	20	6	2
07090	Xylene (total)	1330-20-7	6	0.7	30	3	2

MDL = Method Detection Limit

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	BTEX/C2-C10 Hydrocarbons	EPA 18 mod/EPA 25 mod	1	M1911330AA	04/23/2019 14:06	Jeffrey B Smith	2

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Sample Description:	**Effluent-A2-190418 Air** **Facility# 306456 SUMMA CAN# 1348** **328.5 Illinois St. - Fairbanks, AK**	**Chevron** **ELLE Sample #:** **ELLE Group #:**	 **AQ 1039883** **2040059**
Project Name:	**306456**		
Submittal Date/Time:	04/20/2019 09:20		
Collection Date/Time:	04/18/2019 12:00 through 04/18/2019 12:00		
SDG#:	LSV44-02		

Sample Comments

State of Alaska Lab Certification No. UST-061

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Quality Control Summary

Client Name: Chevron
Group Number: 2040059
Reported: 04/28/2019 13:38

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1911330AA	Sample number(s): 1039882			
Benzene	N.D.	0.5	N.D.	2
C2-C10 Hydrocarbons as hexane	N.D.	5	N.D.	20
Ethylbenzene	N.D.	0.4	N.D.	2
Toluene	N.D.	0.8	N.D.	3
Xylene (total)	N.D.	0.7	N.D.	3

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1911330AA	Sample number(s): 1039882								
Benzene	10	9.42	10	9.70	94	97	65-118	3	30
Ethylbenzene	10	9.13	10	9.53	91	95	62-123	4	30
Toluene	10	11.64	10	12.06	116	121	79-149	4	30
Xylene (total)	30	26.59	30	28.41	89	95	58-125	7	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 11964 Group # 2040059 For Eurofins Lancaster Laboratories Environmental use only Sample # 1039882-83 Bottle Order (SCR) # 241595

Client Information

Client: Chevron Account #:

Project Name/#: FAIR Unocal 306456

Project Manager: Nicole Monroe P.O. #: ASRTMOEH.3064

Sampler: David Beandoin Quote #:

Name of state where samples were collected: Alaska

Turnaround Time Requested (TAT) (circle one)

Standard | Rush (specify) _____

Data Package Required? Yes / No

EDD Required? Yes / No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient				
Maximum				
Minimum				

Analyses Requested

EPA TO-15 | EPA 18 | EPA 25 (select range below) | Helium as tracer | O2/CO2 | Library Search | MTBE | BTEX

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure In Field ("Hg) (Start)	Canister Pressure In Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25	Helium as tracer	O2/CO2	Library Search	MTBE	BTEX
Effluent-A1-190418	4.18.19 11:55	/11:55	-29	-6	—	—	1373	~~1346~~ B	6	—		X	X					X
Effluent-A2-190418	4.18.19 12:00	/12:00	-30	-6	—	—	1348	~~1373~~	6	—		X	X					X

Instructions/QC Requirements & Comments

Effluent-A2-190418 Hold / Backup for Canister #1373

EPA 25 (check one): ☐ C1 - C4 ☐ C1 - C10 ☐ C2 - C4 ☒ C2 - C10 ☐ C4 - C10 (GRO)

Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Canisters Shipped by: 7445 4/4/19	10:50	Canisters Received by:	04/16/19 PM				
Relinquished by:	4.18.19 13:40	Received by: FedEx Fairbanks					
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time: 4/20/19 0920

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Sample Administration Receipt Documentation Log

Doc Log ID: 246966

Group Number(s): 2040059

Client: Chevron

FAIR Unocal 306456

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	04/20/2019 9:20
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	AK		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	Yes
Extra Samples:	No	Flow Controller Quantity:	1
Discrepancy in Container Qty on COC:	No	Air Quality Returns:	No

Unpacked by Nicole Reiff (25684) at 14:26 on 04/20/2019

General Comments: Bag of summa tools.

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Lancaster, PA 17605-2425

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F | 717-656-2681
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Laboratory Data Review Checklist

Completed by: Colleen Taggart

Title: Environmental Engineer 2

Date: August 1, 2019

CS Report Name: Effluent-A1-190418 Air

Report Date: April 18, 2019

Consultant Firm: Arcadis U.S., Inc.

Laboratory Name: Eurofins Lancaster Laboratories Environmental

Laboratory Report Number: LSV44-2040059

ADEC File Number: 102.38.004

ADEC RecKey Number: 733

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ☑ Yes ☐ No

   Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ☐ Yes ☐ No ☑ N/A

   Comments:

   No analysis was sub-contracted

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No

   Comments:

   b. Correct analyses requested?

   ☑ Yes ☐ No

   Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☑ Yes ☐ No

Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☑ Yes ☐ No

Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

☐ Yes ☑ No

Comments: No sample containers were damaged

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐ Yes ☐ No ☑ N/A

Comments: No discrepancies were noted

e. Data quality or usability affected? Explain.

Comments: Data quality/usability was not affected

4. Case Narrative

a. Present and understandable?

☐ Yes ☑ No

Comments: There was no case narrative included in the report

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☑ No

Comments:

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ N/A

Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality/usability was not affected

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☑ Yes ☐ No

Comments:

b. All applicable holding times met?

☑ Yes ☐ No

Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No ☑ N/A

Comments:

Soil not analyzed for this report

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☐ Yes ☐ No ☑ N/A

Comments:

No required PQLs required for effluent monitoring at this site.

e. Data quality or usability affected?

Comments:

Data quality/usability was not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☑ Yes ☐ No

Comments:

ii. All method blank results less than PQL?

☑ Yes ☐ No

Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A Comments:

No data was flagged

v. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☑ Yes ☐ No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable. No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A Comments:

vii. Data quality or usability affected? (Use comment box to explain)

Comments:

Data quality/usability was not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☐ Yes ☐ No ☑ N/A

Comments:

Surrogates are not required for air sample analysis.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☐ No ☑ N/A

Comments:

No surrogate recoveries were reported for air sample analysis.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A

Comments:

No surrogate recoveries were reported for air sample analysis.

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Data quality/usability was not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and cooler?

☐ Yes ☑ No

Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☐ Yes ☐ No ☑ N/A

Comments:

No trip blank was submitted for air sample analysis.

iii. All results less than PQL?

☐ Yes ☐ No ☑ N/A

Comments:

Not applicable.

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☐ Yes ☑ No

Comments:

ii. Submitted blind to lab?

☐ Yes ☐ No ☑ N/A

Comments:

No field duplicate was submitted for air sample analysis.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☐ No ☑ N/A

Comments:

No field duplicate was submitted for air sample analysis.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality/usability was not affected.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

☐ Yes ☐ No ☑ N/A

i. All results less than PQL?

☐ Yes ☐ No ☑ N/A

Comments:

No field blank sample was submitted for air sample analysis.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☐ No ☑ N/A

Comments:

Results had no flags/qualifiers

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Type III Data Package

Prepared for:

Chevron
L4310
6001 Bollinger Canyon Road
San Ramon CA 94583

Project: 306456
Air Sample
Collected on 05/24/19

SDG# LSV62

GROUP	SAMPLE NUMBERS
2046101	1067923

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-18-27
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M. Kauffman **Date:** **06/17/2019**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Loran Carter at (717) 556-7252.

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Table of Contents for SDG# LSV62

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Sample Reference List for SDG Number LSV62 with a Data Package Type of III

11964 - Chevron
Project: 306456

Lab Sample Number	Client Sample ID	Collection Date	Date Received
1067923	Effluent-A2-190524 Summa	05/24/2019 12:00	05/29/2019 10:20

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

07090 BTEX/MTBE/Hydrocarbons by GC

Air samples are collected in Tedlar bags or passivated SUMMA canisters. The sample is introduced, using a gas-sampling loop, into a gas chromatograph equipped with a capillary column and interfaced directly to a flame ionization and photoionization detector (FID, PID). The FID is used for the determination of aliphatic hydrocarbons and the PID is used for determination of aromatic hydrocarbons.

Reference: 40 CFR Part 60, Appendix A, EPA Methods 18 & 25, July 1997

Analysis Reports / Field Chain of Custody

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Chevron
L4310
6001 Bollinger Canyon Road
San Ramon CA 94583

Report Date: June 03, 2019 14:57

Project: 306456

Account #: 11964
Group Number: 2046101
SDG: LSV62
PO Number: 0015309139
Release Number: HETRICK

State of Sample Origin: AK

Electronic Copy To	Arcadis	Attn: Melissa Blanchette
Electronic Copy To	Arcadis	Attn: Arti Patel
Electronic Copy To	Arcadis	Attn: Nicole Monroe

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

To view our laboratory's current scopes of accreditation please go to https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/ . Historical copies may be requested through your project manager.

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
Effluent-A2-190524 Summa Air	05/24/2019 12:00	1067923
Effluent-A1-190524 Summa Air	05/24/2019 11:58	1067924

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **Effluent-A2-190524 Summa Air**
Facility# 306456 SUMMA CAN# 1167
328.5 Illinois Street - Fairbanks, AK

Chevron
ELLE Sample #: AQ 1067923
ELLE Group #: 2046101
Matrix: Air

Project Name: **306456**

Submittal Date/Time: 05/29/2019 10:20
Collection Date/Time: 05/24/2019 12:00
SDG#: LSV62-01

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	1	N.D.	3	2
07090	C2-C10 Hydrocarbons as hexane	n.a.	140	10	500	35	2
07090	Ethylbenzene	100-41-4	N.D.	0.8	N.D.	3	2
07090	Toluene	108-88-3	N.D.	2	N.D.	6	2
07090	Xylene (total)	1330-20-7	N.D.	0.7	N.D.	3	2

MDL = Method Detection Limit

Sample Comments

State of Alaska Lab Certification No. UST-061

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	BTEX/C2-C10 Hydrocarbons	EPA 18 mod/EPA 25 mod	1	M1915130AA	05/31/2019 18:43	Jeffrey B Smith	2

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Sample Description:	**Effluent-A1-190524 Summa Air** **Facility# 306456 SUMMA CAN# 1313** **328.5 Illinois Street - Fairbanks, AK**	**Chevron** **ELLE Sample #:** **ELLE Group #:**	 **AQ 1067924** **2046101**
Project Name:	**306456**		
Submittal Date/Time:	05/29/2019 10:20		
Collection Date/Time:	05/24/2019 11:58		
SDG#:	LSV62-02		

Sample Comments

State of Alaska Lab Certification No. UST-061

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Quality Control Summary

Client Name: Chevron
Reported: 06/03/2019 14:57

Group Number: 2046101

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1915130AA	Sample number(s): 1067923			
Benzene	N.D.	0.5	N.D.	2
C2-C10 Hydrocarbons as hexane	N.D.	5	N.D.	20
Ethylbenzene	N.D.	0.4	N.D.	2
Toluene	N.D.	0.8	N.D.	3
Xylene (total)	N.D.	0.7	N.D.	3

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1915130AA	Sample number(s): 1067923								
Benzene	10	9.61	10	9.11	96	91	65-118	5	30
Ethylbenzene	10	10.45	10	9.37	104	94	62-123	11	30
Toluene	10	12.7	10	11.66	127	117	79-149	9	30
Xylene (total)	30	30.16	30	26.23	101	87	58-125	14	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 11964 Group # 2046101 Sample # 106923-24 Bottle Order (SCR) # 243159

For Eurofins Lancaster Laboratories Environmental use only

Client Information

Client: Chevron — Account #: 11984

Project Name/#: FAIR 4 Hour 1

Project Manager: Eric Hetrick — P.O. #: DEMAK000.6456

Sampler: David Beaudoin — Quote #:

Name of state where samples were collected:

Turnaround Time Requested (TAT) (circle one)

Standard — Rush (specify): _____

Data Package Required? (Yes) No

EDD Required? (Yes) No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient				
Maximum				
Minimum				

Analyses Requested

EPA TO - 15 | EPA 18 ☐ MTBE ☒ BTEX | EPA 25 (select range below) | Helium as tracer | O2/CO2 | Library Search

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID (B)	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25	Helium as tracer	O2/CO2	Library Search
Effluent - A2 - 190524	5.24.19 12:00	5.24.19 12:00	-30	-5	—	—	—	1167	1	—		X	X			
Effluent - A1 - 190524	5.24.19 11:58	5.24.19 11:58	-30	-5	—	—	—	1313	1	—						

Instructions/QC Requirements & Comments:

Effluent - A1 - 190524 is a back up sample - Hold Analysis pending any issues w/ Effluent - A2 - 190524

EPA 25 (check one): ☐ C1 - C4 ☒ C2 - C10 ☐ C1 - C10 ☐ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
[signature] 5/14/19	8:58						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 5/29/19 1020

Eurofins Lancaster Laboratories Environmental, LLC - 2425 New Holland Pike, Lancaster, PA 17601 - 717 656-2300

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7056 1015

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Sample Administration Receipt Documentation Log

Doc Log ID: 250126

Group Number(s): 2046101

Client: Chevron

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	05/29/2019 10:20
Number of Packages:	1	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Nicole Reiff (25684) at 12:59 on 05/29/2019

2425 New Holland Pike
Lancaster, PA 17601-5425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Volatile Organics in Air by GC Data

Case Narrative/Conformance Summary

Volatile Organics in Air by GC

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Case Narrative/Conformance Summary

CLIENT: Chevron
SDG: LSV62

Volatiles in Air

Fraction: Volatile Organics in Air by GC

Sample #	Client ID	DF	Comments
1067923	Effluent-A2-190524 Summa	2	

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specifications.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

LOQ = Limit of Quantitation	LCS = Lab Control Sample
MDL = Method Detection Limit	LCSD = Lab Control Sample Duplicate
ND = Not Detected	RE = Repreparation/Reanalysis
J = Estimated Value	* = Out of Specification
E= out of calibration range	

Quality Control and Calibration Summary Forms

Volatile Organics in Air by GC

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Quality Control Reference List
Volatiles in Air

CLIENT: Chevron
SDG: LSV62

Fraction: Volatile Organics in Air by GC

Analysis	Batch Number	Sample Number	Analysis Date
BTEX/C2-C10 Hydrocarbons	M1915130AA	VBLK151B	05/31/2019 12:24
		LCS151Q	05/31/2019 13:09
		LCSD151Y	05/31/2019 13:41
		1067923	05/31/2019 18:43

Quality Control Summary
Method Blank
Volatiles in Air
SDG: LSV62
Matrix: AIR

Fraction: Volatile Organics in Air by GC

M1915130AA / VBLK151B Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
Benzene	05/31/19	N.D.	ppm(v)	0.5	1
C2-C10 Hydrocarbons as hexane	05/31/19	N.D.	ppm(v)	5	10
Ethylbenzene	05/31/19	N.D.	ppm(v)	0.4	1
Toluene	05/31/19	N.D.	ppm(v)	0.8	1
Xylene (total)	05/31/19	N.D.	ppm(v)	0.7	2

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: LSV62
Matrix: AIR

Volatiles in Air

Fraction: Volatile Organics in Air by GC

LCS: LCS151Q LCSD: LCSD151Y **Analyte**	Batch: **M1915130AA** (Sample number(s): 1067923)							
	Spike Added ppm(v)	**LCS Conc ppm(v)**	**LCSD Conc ppm(v)**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Benzene	10	9.61	9.11	96	91	65-118	5	30
Ethylbenzene	10	10.45	9.37	104	94	62-123	11	30
Toluene	10	12.7	11.66	127	117	79-149	9	30
Xylene (total)	30	30.16	26.23	101	87	58-125	14	30

Fraction: Volatile Organics in Air by GC

07090: BTEX/C2-C10 Hydrocarbons Analyte Name	Default MDL	Default LOQ	Units
C2-C10 Hydrocarbons as hexane	5	10	ppm(v)
Benzene	0.5	1	ppm(v)
Toluene	0.8	1	ppm(v)
Ethylbenzene	0.4	1	ppm(v)
Xylene (total)	0.7	2	ppm(v)

Theoretical Standard Concentrations for EPA Methods 18 and 25 / TO-3 (modified)

Compound Name	MDL0.2 [ppm(v)]	VSTD001 [ppm(v)]	VSTD005 [ppm(v)]	VSTD010 [ppm(v)]	VSTD025 [ppm(v)]	VSTD100 [ppm(v)]	VSTD500 [ppm(v)]
Methane	0.2	1	5	10	25	100	500
Ethane	0.2	1	5	10	25	100	n/a
Propane	0.2	1	5	10	25	100	n/a
Butane	0.2	1	5	10	25	100	n/a
Pentane	0.2	1	5	10	25	100	n/a
Methyl t-butyl Ether	0.2	1	5	10	25	100	n/a
Hexane	0.2	1	5	10	25	100	n/a
Decane	0.04	0.2	1	2	5	20	n/a
Octane	0.2	1	5	10	25	100	n/a
Benzene	0.2	1	5	10	25	100	n/a
Toluene	0.2	1	5	10	25	100	n/a
Ethylbenzene	0.2	1	5	10	25	100	n/a
m/p-Xylene	0.4	2	10	20	50	200	n/a
o-Xylene	0.2	1	5	10	25	100	n/a

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FORM 06
VOLATILE ORGANICS IN AIR
INITIAL CALIBRATION DATA

SDG No.:

Instrument ID: 58309 Cal. Start Date: 02/01/2019 Cal. End Date: 02/01/2019

Cal. Start Time: 09:20 Cal. End Time: 13:15

FID File IDs:

RF 1 =	RF 5 =	RF 10 =	RF 25 =	RF 100 =	RF 500 =
19032.0003.d	19032.0002.d	19032.0001.d	19032.0004.d	19032.0005.d	19032.0007.d

PID File IDs:

RF 1 =	RF 5 =	RF 10 =	RF 25 =	RF 100 =	RF 500 =
19032B.0003.d	19032B.0002.d	19032B.0001.d	19032B.0004.d	19032B.0005.d	19032B.0007.d

	COMPOUND		RF 1	RF 5	RF 10	RF 25	RF 100		$\overline{RF}$	% RSD	Cal. Method	
	Methane		****	2821	2919	2917	3379	3181	3044	8	AVG	
	Ethane		5596	5660	5961	5643	6415	****	5855	6	AVG	
	Propane		8710	7728	8473	8137	9418	****	8493	7	AVG	
	Butane		10021	9884	10978	10883	12539	****	10861	10	AVG	
	Pentane		12423	11746	12936	12941	15025	****	13014	9	AVG	
+	MTBE		6626	6508	7945	6855	7740	****	7135	9	AVG	
	Hexane		14288	13116	14807	14759	17497	****	14893	11	AVG	
+	Benzene		9500	9934	11779	10610	11618	****	10688	9	AVG	
+	Toluene		5244	6196	7729	7378	9003	****	7110	20	AVG	
	Octane		11805	15125	19448	16498	20338	****	16643	21	AVG	
+	Ethylbenzene		4309	4928	6696	5525	6928	****	5677	20	AVG	
+	m/p-Xylene		7637	7276	10009	7431	8879	****	8246	14	AVG	
+	o-Xylene		8745	6943	9961	6445	8054	****	8029	18	AVG	
	Decane	#	21450	1668	6351	****	****	****	9823	105	AVG	#

Average % RSD: 19

* Maximum %RSD = 25%.
\+ Compound reported from PID file
\# Decane is used as a retention time marker only.

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FORM 03
VOLATILE ORGANICS IN AIR
LABORATORY CONTROL SAMPLE RECOVERY

SDG No.:

Instrument ID: 58309 LCS FID File ID: 19032.0010.d LCSD FID File ID: 19032.0011.d

Batch: M1903230AA LCS PID File ID: 19032B.0010.d LCSD PID File ID: 19032B.0011.d

Dilution Factor: 1 LCS Injected: 02/01/2019 LCSD Injected: 02/01/2019

Method: EPA 18 mod/EPA 25 mod LCS Injected Time: 14:51 LCSD Injected Time: 15:20

LCS Client ID: lcs032 LCSD Client ID: lcsd032

COMPOUND	SPIKE LEVEL	LCS CONC. (ppm(v))	LCSD CONC. (ppm(v))	LCS %REC	LCSD %REC	RANGE	%RPD	RPD MAX	IN SPEC
Benzene	10.00	9.99	9.82	100	98	65 - 118	2	30	YES
Toluene	10.00	12.66	12.66	127	127	79 - 149	0	30	YES
Ethylbenzene	10.00	9.75	10.18	98	102	62 - 123	4	30	YES
Xylene (total)	30.00	28.19	29.52	94	98	58 - 125	5	30	YES

COMMENTS:
Applies to Sample(s): 9973284-9973289

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FORM 07
VOLATILE ORGANICS IN AIR
CONTINUING CALIBRATION CHECK

SDG No.:

Lab FID File ID: 19151.0001.d
Calibration Date: 05/31/2019

Lab PID File ID: 19151B.0001.d
Calibration Time: 11:36

Instrument ID: 58309
Init. Calib. Date(s): 02/01/2019

	COMPOUND		$\overline{RF}$	RF	ACTUAL CONC.	TRUE CONC.	%DRIFT
	Methane		3044	3028	9.950	10	-1
	Ethane		5855	5628	9.613	10	-4
	Propane		8493	8121	9.562	10	-4
	Butane		10861	10741	9.890	10	-1
	Pentane		13014	12872	9.891	10	-1
+	MTBE		7135	6194	8.681	10	-13
	Hexane		14893	14816	9.948	10	-1
+	Benzene		10688	9984	9.341	10	-7
+	Toluene		7110	6857	9.644	10	-4
	Octane		16643	18178	10.922	10	9
+	Ethylbenzene		5677	5580	9.829	10	-2
+	m/p-Xylene		8246	7739	18.769	20	-6
+	o-Xylene		8029	7098	8.840	10	-12
	Decane	#	5624	6285	2.235	2	12 #

* Maximum %DRIFT = 25%.
+ Compound reported from PID file
# Decane is used as a retention time marker only.

Sample Data

Volatile Organics in Air by GC

Lancaster Laboratories, Inc.
Analysis Summary for GC Volatiles in Air

1067923

FID Data file: /chem/A58309.i/19may31.b/19151.0013.d Injection date and time: **31-MAY-2019 18:43**
FID Data file Sample Info. Line: 1067923 Instrument ID: **A58309.i** Batch: **M1915130AA**
Date, time and analyst ID of latest FID file update: 03-Jun-2019 13:03 jbs01304

FID Blank Data file reference: **/chem/A58309.i/19may31.b/19151B.0002.d**

FID Method used: /chem/A58309.i/19may31.b/gc_fid.m FID Sublist used: **6650**
FID Calibration date and time (Last Method Edit): 03-JUN-2019 13:02
FID Mid Level Daily Calibration Standard Reference: **/chem/A58309.i/19may31.b/19151.0001.d**

PID Data file: /chem/A58309.i/19may31.b/19151B.0013.d Injection date and time: **31-MAY-2019 18:43**
PID Data file Sample Info. Line: 1067923 Instrument ID: **A58309.i** Batch: **M1915130AA**
Date, time and analyst ID of latest PID file update: 03-Jun-2019 13:12 jbs01304

PID Blank Data file reference: **/chem/A58309.i/19may31.b/19151.0002.d**

PID Method used: /chem/A58309.i/19may31.b/gc_pid.m PID Sublist used: **BTEX**
PID Calibration date and time (Last Method Edit): 03-JUN-2019 12:47
PID Mid Level Daily Calibration Standard Reference: **/chem/A58309.i/19may31.b/19151B.0001.d**

Sampling Media: Tedlar Bag Bottle code: N/A Matrix: AIR On-Column Amount units: ppm(v) In Sample Concentration units: ppm(v)

Sample Concentration Formula: On-Column Amount * DF * IVn/IVa Dilution Factor (DF): 2
Nominal Injection Volume (IVn): 100 cc Actual injection Volume (IVa): 100 cc

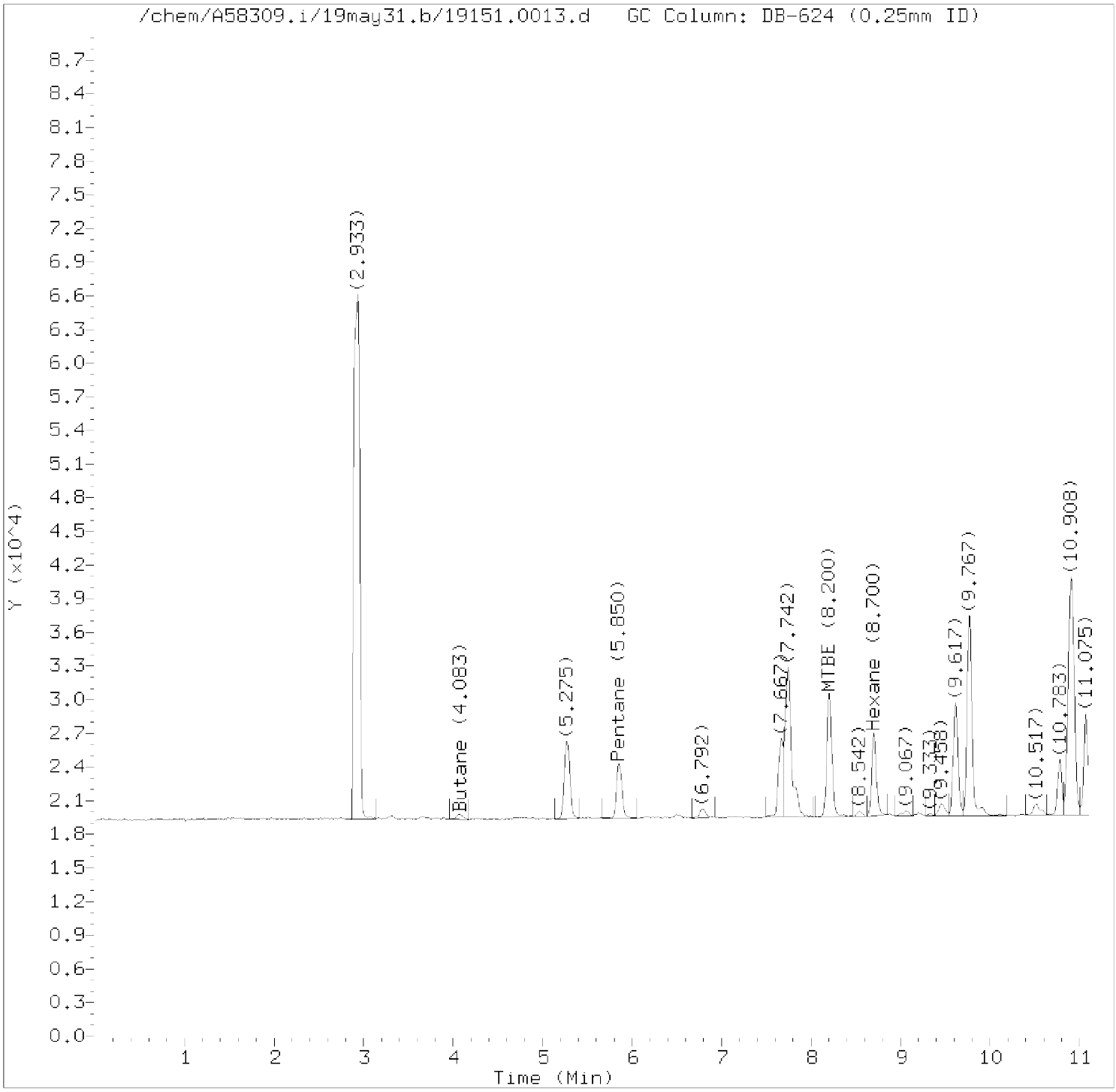
Analysis Comments:

Single Component, Summary, and Range Target Compounds	Expected RT(±window)	RT Low Limit	RT	RT High Limit	Area	On-Column Concentration (ppm(v))	In Sample Concentration (ppm(v))	Blank Conc.	Qual.	Reporting Limit (on-column)	LOQ
18) C2-C10 Hydrocarbons as hexane		3.003		19.313	1048898	70.427	140.854			5	10
2) Benzene	11.367(±0.06)	11.307	N.D.	11.427		Not Detected				0.5	1
3) Toluene	14.442(±0.03)	14.412	N.D.	14.472		Not Detected				0.8	1
4) Ethylbenzene	16.892(±0.04)	16.852	N.D.	16.932		Not Detected				0.4	1
5) m/p-Xylene	17.075(±0.04)	17.035	N.D.	17.115		Not Detected				0.7	2
6) o-Xylene	17.750(±0.04)	17.710	N.D.	17.790		Not Detected				0.7	2
7) Xylene (total)						Not Detected				0.7	2

Total number of FID targets = 1 Total number of PID targets = 6

Digitally signed by Jeffrey B. Smith on 06/03/2019 at 13:14. Target 3.5 esignature user ID: jbs01304

Secondary review performed and digitally signed by Jeffrey B. Smith on 06/13/2019 at 10:05. PARALLAX ID: jbs01304



Total Ion Chromatogram (TIC)

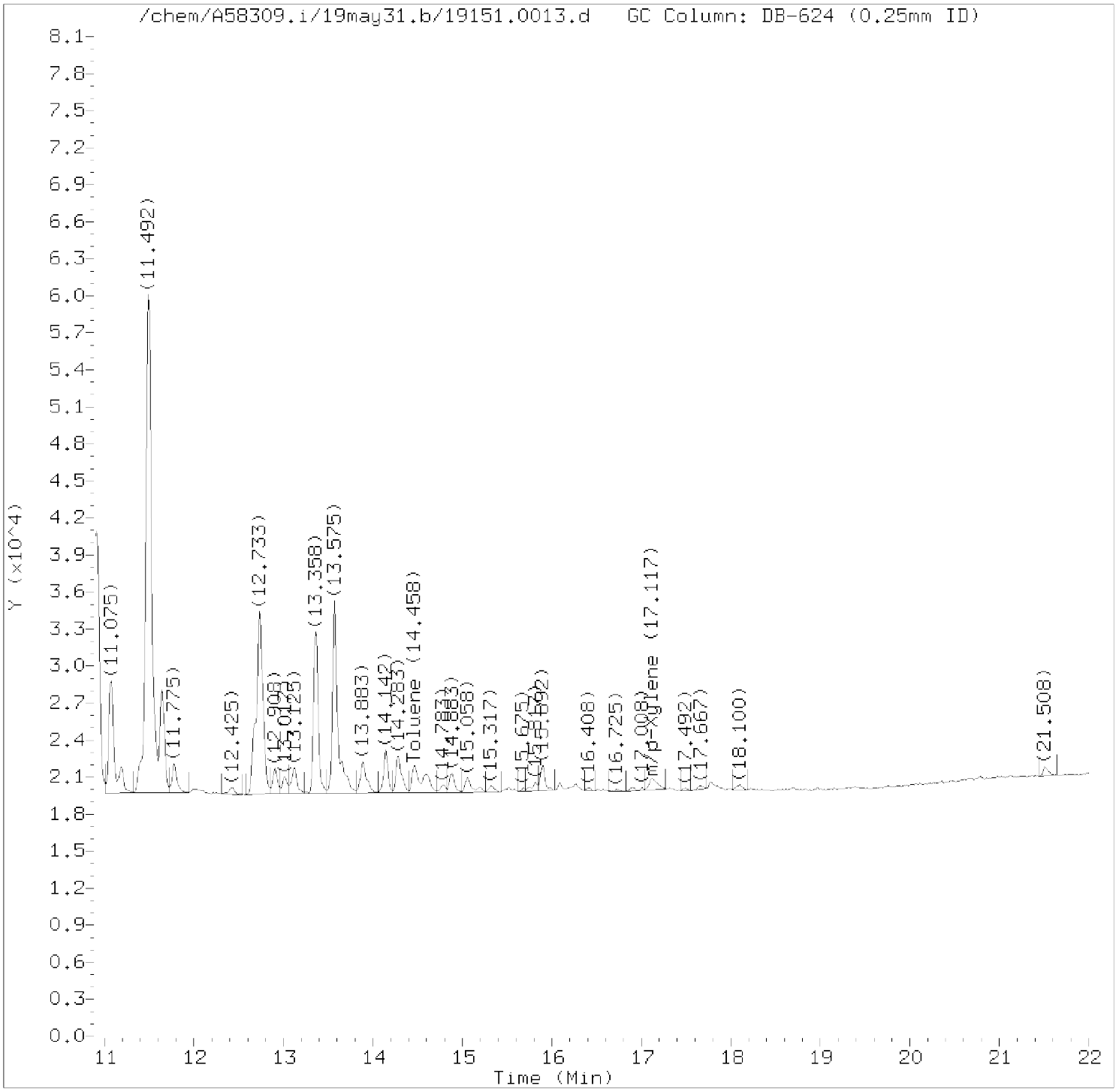
Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: 6650
Calibration date and time: 03-JUN-2019 13:02
Date, time and analyst ID of latest file update: 03-Jun-2019 13:03 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: 6650
Calibration date and time: 03-JUN-2019 13:02
Date, time and analyst ID of latest file update: 03-Jun-2019 13:03 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Quant Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: 6650
Calibration date and time: 03-JUN-2019 13:02
Date, time and analyst ID of latest file update: 03-Jun-2019 13:03 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Single Component and Summary Compounds	Expected RT(±window)	RT	Area	On-Column Concentration (ppm(v))

No integrated signals resulted in on-column concentrations above the reporting limit.

Range Target Compounds	Range Start RT	Range End RT	Area	On-Column Concentration (ppm(v))
18) C2-C10 Hydrocarbons as hexane	3.003	19.313	1048898	70.427

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: 6650
Calibration date and time: 03-JUN-2019 13:02
Date, time and analyst ID of latest file update: 03-Jun-2019 13:03 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

RT	Area	Peak Label(s) and Range Compound #s
2.933	214932	
4.083	2541	Butane 18
5.275	30496	18
5.850	21485	Pentane 18
6.792	3772	18
7.667	24656	18
7.742	67400	18
8.200	44956	MTBE 18
8.542	1973	18
8.700	27042	Hexane 18
9.067	2125	18
9.333	705	18
9.458	5616	18
9.617	38224	18
9.767	69298	18
10.517	5633	18
10.783	16900	18
10.908	102741	18
11.075	41071	18
11.492	212966	18
11.775	9368	18
12.425	2420	18
12.733	78424	18
12.908	7469	18
13.017	5220	18
13.125	9066	18
13.358	48150	18
13.575	68215	18
13.883	12783	18
14.142	12181	18
14.283	13323	18
14.458	19230	Toluene 18
14.783	2579	18
14.883	6415	18
15.058	6941	18
15.317	2437	18
15.675	714	18
15.817	3283	18
15.892	7608	18
16.408	767	18

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

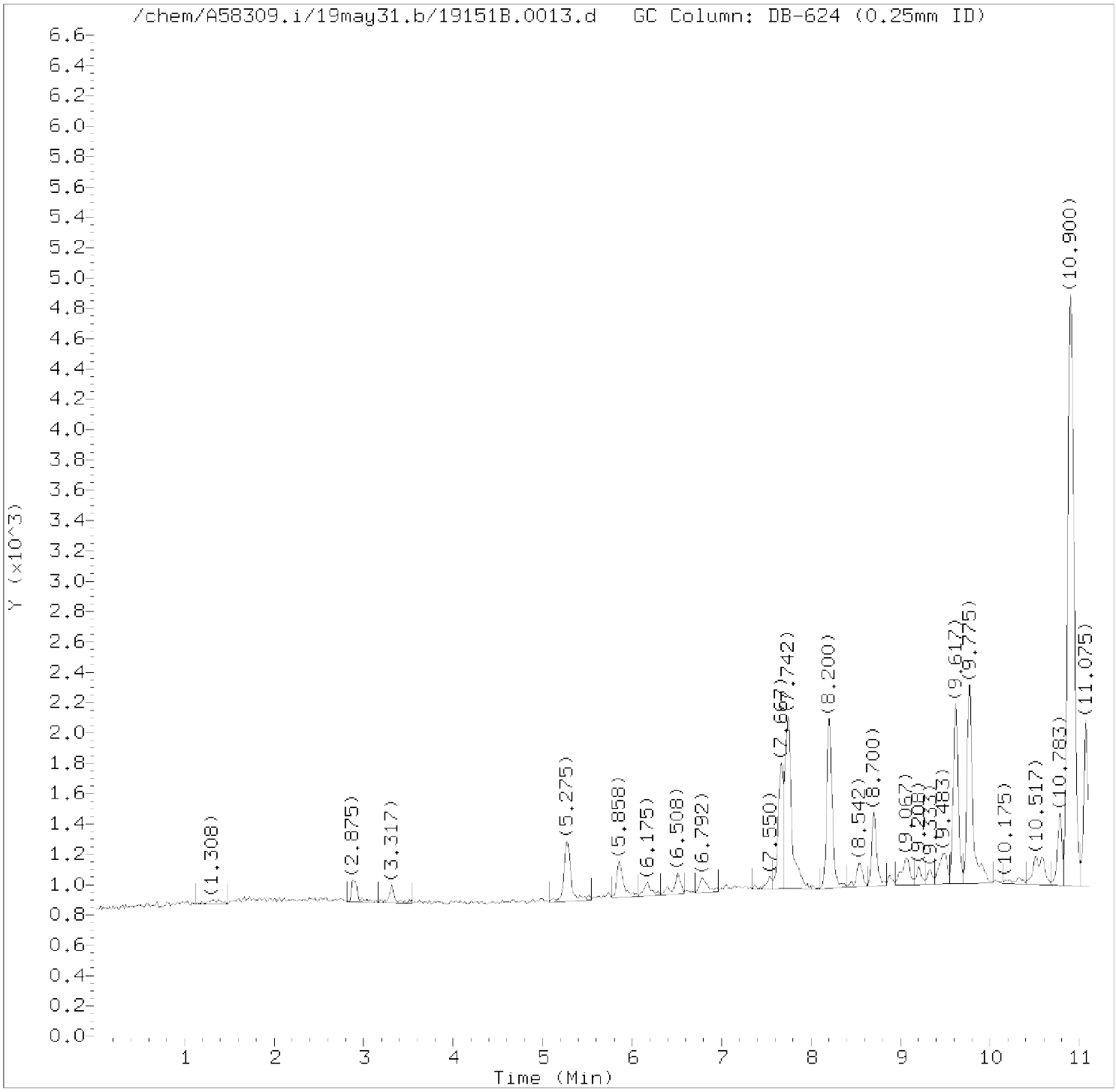
Data File: /chem/A58309.i/19may31.b/19151.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: 6650
Calibration date and time: 03-JUN-2019 13:02
Date, time and analyst ID of latest file update: 03-Jun-2019 13:03 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

RT	Area	Peak Label(s) and Range Compound #s
16.725	859	18
17.008	1831	18
17.117	5933	m/p-Xylene 18
17.492	708	18
17.667	1353	18
18.050	5933	
18.100	2022	18
21.508	3165	

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

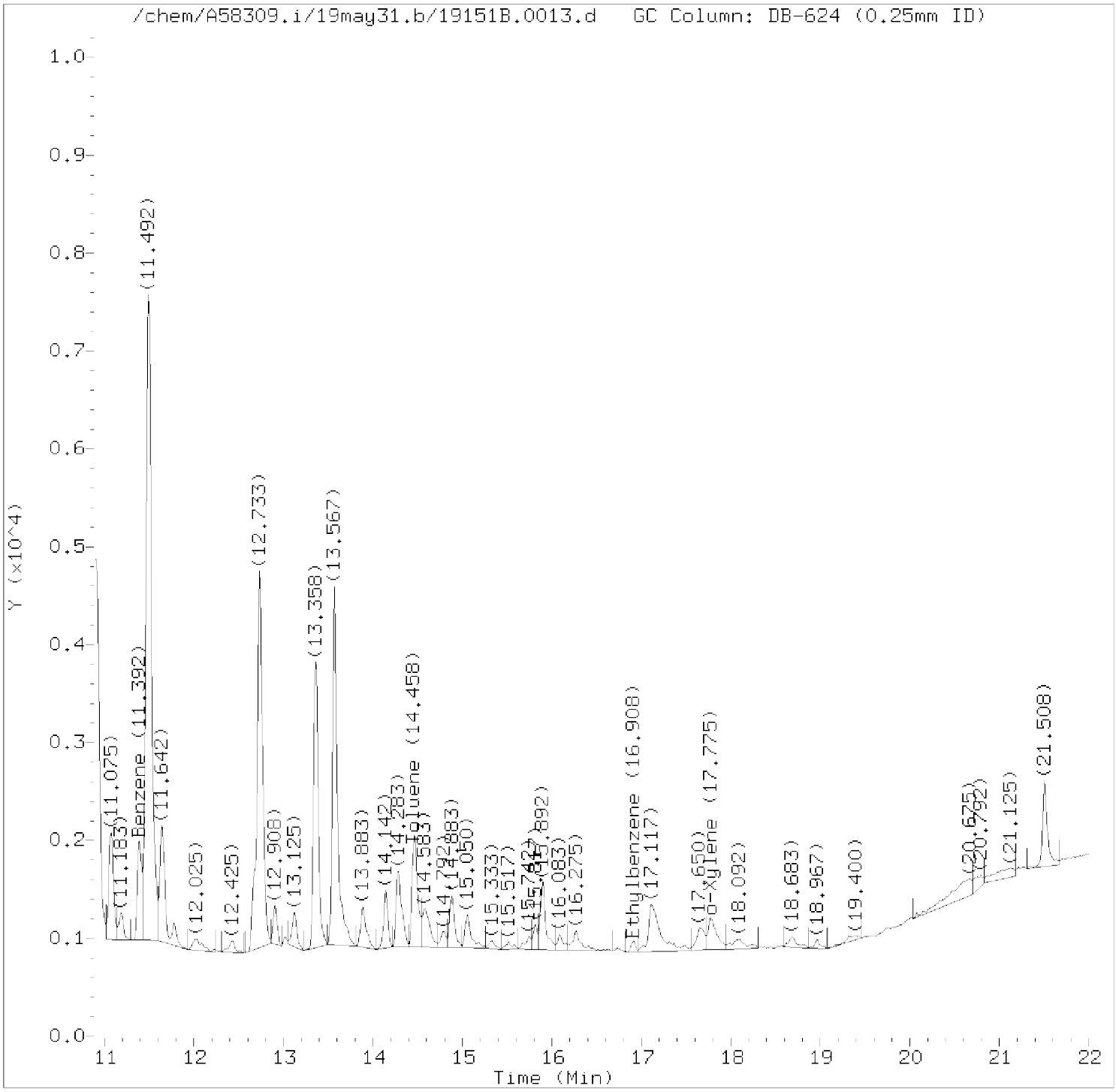
Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Quant Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Single Component and Summary Compounds	Expected RT(±window)	RT	Area	On-Column Concentration (ppm(v))

No integrated signals resulted in on-column concentrations above the reporting limit.

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

RT	Area	Peak Label(s) and Range	Compound #s
1.308	310		
2.875	827		
3.317	581		
5.275	2304		
5.858	1266		
6.175	556		
6.508	811		
6.792	675		
7.550	400		
7.667	3382		
7.742	5883		
8.200	4881		
8.542	782		
8.700	1955		
9.067	1159		
9.208	465		
9.333	383		
9.483	1306		
9.617	4644		
9.775	5860		
10.175	369		
10.517	1606		
10.783	1728		
10.900	19648		
11.075	3996		
11.183	1068		
11.392	3411	Benzene	
11.492	28238		
11.642	5310		
12.025	906		
12.425	611		
12.733	17053		
12.908	1282		
13.125	1325		
13.358	10785		
13.567	14734		
13.883	1861		
14.142	1965		
14.283	3454		
14.458	4898M	Toluene	

M = Peak was manually integrated.

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

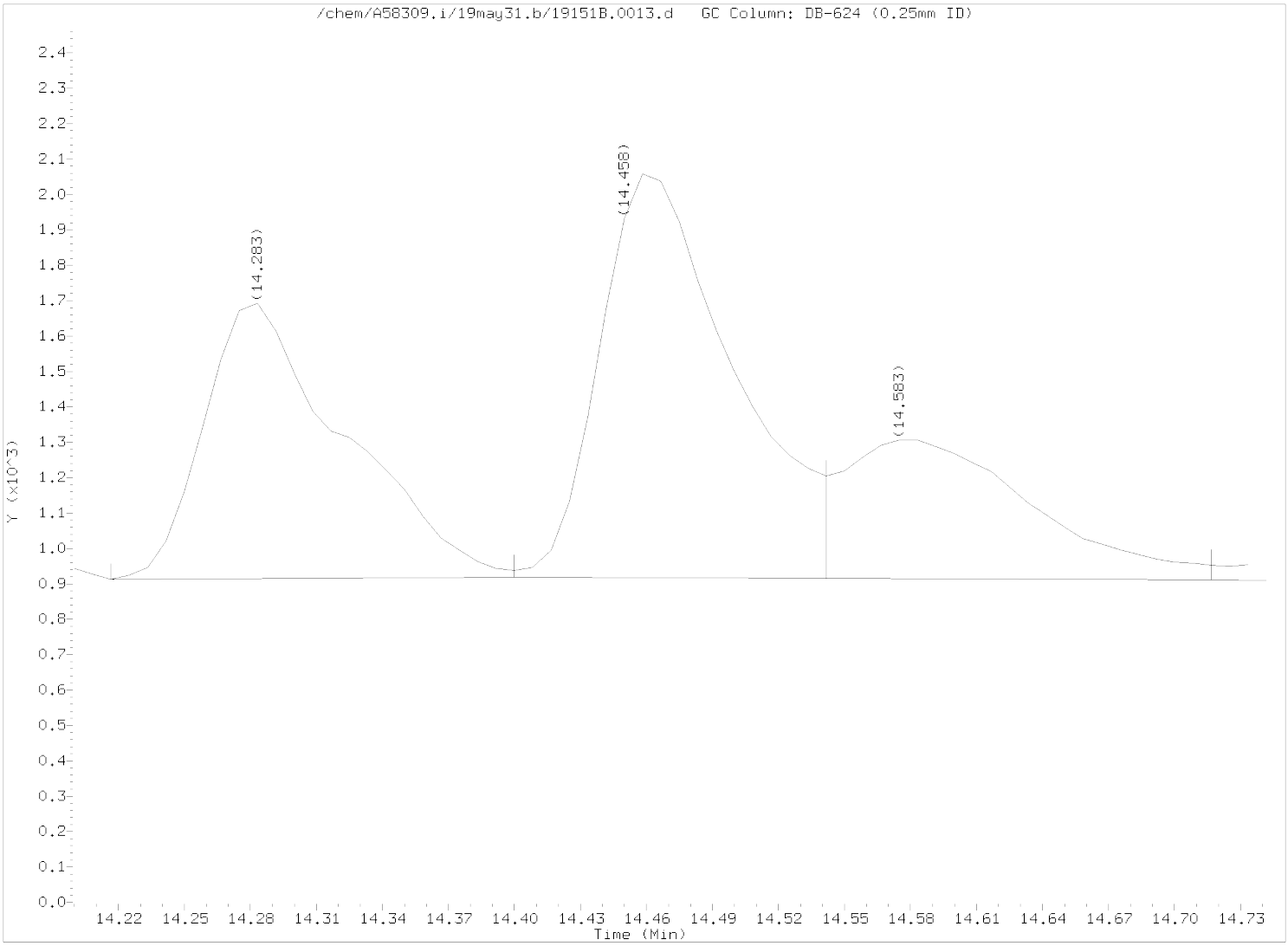
Sample Name: 1067923 Lab Sample ID: 1067923

RT	Area	Peak Label(s) and Range	Compound #s
14.583	2418M		
14.792	694		
14.883	2069		
15.050	1696		
15.333	407		
15.517	398		
15.742	635		
15.817	849		
15.892	2956		
16.083	742		
16.275	1478		
16.908	405	Ethylbenzene	
17.117	4823		
17.650	1452		
17.775	2192	o-Xylene	
18.050	2191		
18.092	1124		
18.683	733		
18.967	419		
19.400	543		
20.675	3267		
20.792	929		
21.125	1606		
21.508	3563		

M = Peak was manually integrated.

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Manually Integrated Signal



Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Retention Time (minutes): 14.458
Area (flag) : 4898M
Integration start time : 14.400 Integration stop time: 14.542
Y at integration start : 918 Y at integration end: 915

Reason for manual integration: improper integration

Analyst responsible for change: Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Secondary review performed and digitally signed by Jeffrey B. Smith on 06/13/2019 at 10:05.
PARALLAX ID: jbs01304

Original Integration of Signal

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

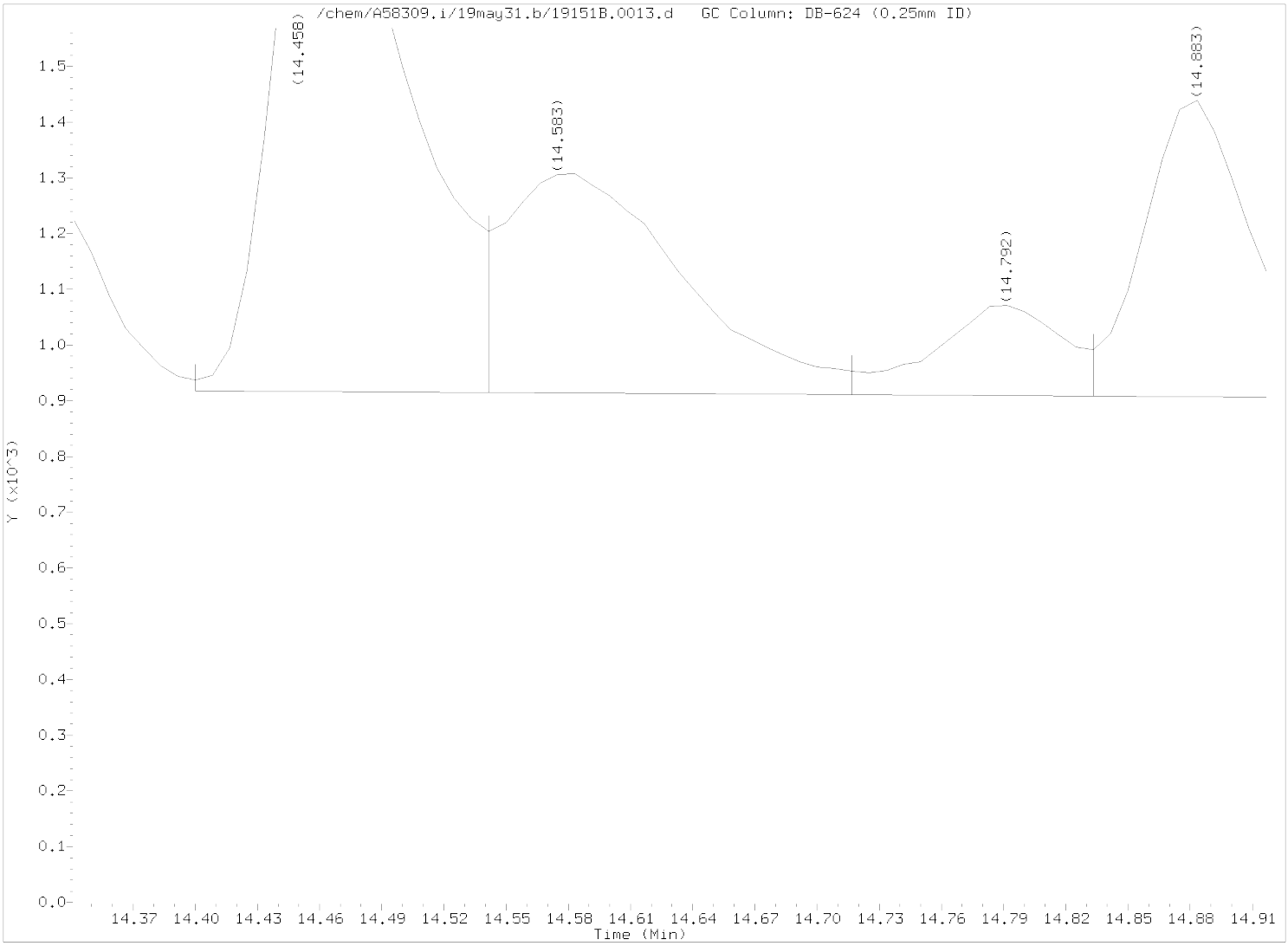
Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: 07090
Calibration date and time: 31-MAY-2019 12:11
Date, time and analyst ID of latest file update: 31-May-2019 19:19 ajs00193

Sample Name: 1067923 Lab Sample ID: 1067923

No signal was originally integrated at 14.458 minutes.

Digitally signed by Jeffrey B. Smith on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Manually Integrated Signal



Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: BTEX
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 13:12 jbs01304

Sample Name: 1067923 Lab Sample ID: 1067923

Retention Time (minutes): 14.583
Area (flag) : 2418M
Integration start time : 14.542 Integration stop time: 14.717
Y at integration start : 915 Y at integration end: 911

Reason for manual integration: Signal not integrated by automation

Analyst responsible for change: Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Secondary review performed and digitally signed by Jeffrey B. Smith on 06/13/2019 at 10:05.
PARALLAX ID: jbs01304

Original Integration of Signal

Data File: /chem/A58309.i/19may31.b/19151B.0013.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 18:43 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: 07090
Calibration date and time: 31-MAY-2019 12:11
Date, time and analyst ID of latest file update: 31-May-2019 19:19 ajs00193

Sample Name: 1067923 Lab Sample ID: 1067923

No signal was originally integrated at 14.583 minutes.

Digitally signed by Jeffrey B. Smith on 06/03/2019 at 13:14.
Target 3.5 esignature user ID: jbs01304

Raw QC Data

Volatile Organics in Air by GC

Lancaster Laboratories, Inc.
Analysis Summary for GC Volatiles in Air

VBLK151

FID Data file: /chem/A58309.i/19may31.b/19151.0002.d Injection date and time: **31-MAY-2019 12:24**
FID Data file Sample Info. Line: VBLK151 Instrument ID: **A58309.i** Batch: **M1915130AA**
Date, time and analyst ID of latest FID file update: 03-Jun-2019 12:47 jbs01304

FID Blank Data file reference: **/chem/A58309.i/19may31.b/19151.0002.d**

FID Method used: /chem/A58309.i/19may31.b/gc_fid.m FID Sublist used: **blank**
FID Calibration date and time (Last Method Edit): 03-JUN-2019 12:47
FID Mid Level Daily Calibration Standard Reference: **/chem/A58309.i/19may31.b/19151.0001.d**

PID Data file: /chem/A58309.i/19may31.b/19151B.0002.d Injection date and time: **31-MAY-2019 12:24**
PID Data file Sample Info. Line: VBLK151 Instrument ID: **A58309.i** Batch: **M1915130AA**
Date, time and analyst ID of latest PID file update: 03-Jun-2019 12:47 jbs01304

PID Blank Data file reference: **/chem/A58309.i/19may31.b/19151B.0002.d**

PID Method used: /chem/A58309.i/19may31.b/gc_pid.m PID Sublist used: **07090**
PID Calibration date and time (Last Method Edit): 03-JUN-2019 12:47
PID Mid Level Daily Calibration Standard Reference: **/chem/A58309.i/19may31.b/19151B.0001.d**

Sampling Media: Tedlar Bag Bottle code: N/A Matrix: AIR On-Column Amount units: ppm(v) In Sample Concentration units: ppm(v)

Sample Concentration Formula: On-Column Amount * DF * IVn/IVa Dilution Factor (DF): 1
Nominal Injection Volume (IVn): 100 cc Actual injection Volume (IVa): 100 cc

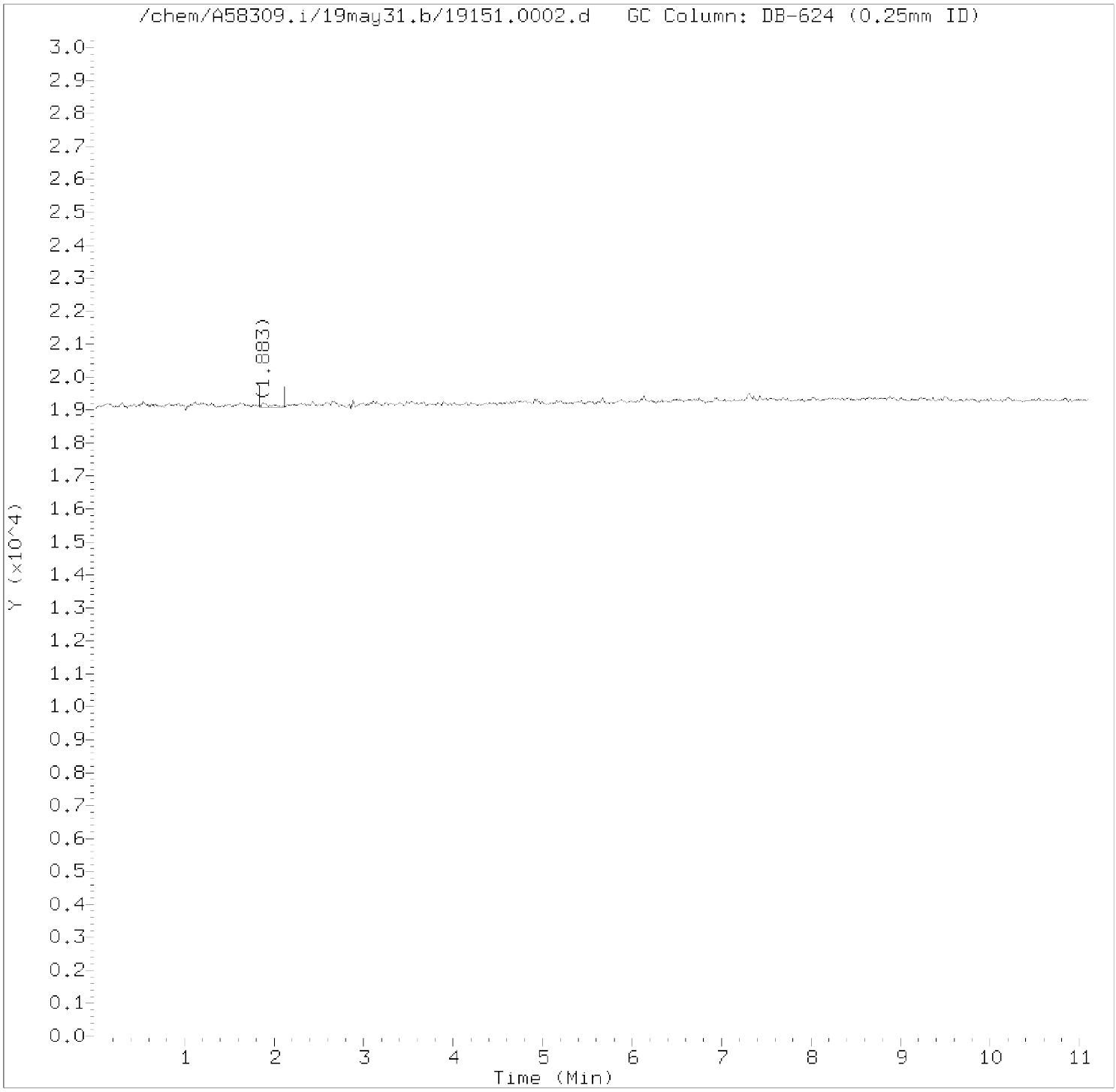
Analysis Comments:

Single Component, Summary, and Range Target Compounds	Expected RT(±window)	RT Low Limit	RT	RT High Limit	Area	On-Column Concentration (ppm(v))	In Sample Concentration (ppm(v))	Blank Conc.	Qual.	Reporting Limit (on-column)	LOQ
1) Methane	2.900(±0.03)	2.870	N.D.	2.930			Not Detected			2	5
2) Ethane	3.033(±0.03)	3.003	N.D.	3.063			Not Detected			0.5	0.5
3) Propane	3.300(±0.03)	3.270	N.D.	3.330			Not Detected			0.2	1
4) Butane	4.067(±0.03)	4.037	N.D.	4.097			Not Detected			0.3	1
5) Pentane	5.842(±0.03)	5.812	N.D.	5.872			Not Detected			0.3	1
7) Hexane	8.692(±0.03)	8.662	N.D.	8.722			Not Detected			0.2	1
16) C2-C10 Hydrocarbons as methane		3.003		19.313			Not Detected			5	10
17) C2-C10 Hydrocarbons as propane		3.003		19.313			Not Detected			5	10
18) C2-C10 Hydrocarbons as hexane		3.003		19.313			Not Detected			5	10
19) C2-C4 Hydrocarbons as methane		3.003		4.097			Not Detected			5	10
20) C2-C4 Hydrocarbons as propane		3.003		4.097			Not Detected			5	10
21) C2-C4 Hydrocarbons as hexane		3.003		4.097			Not Detected			5	10
22) C1-C10 Hydrocarbons as methane		2.870		19.313			Not Detected			5	10
23) C1-C10 Hydrocarbons as propane		2.870		19.313			Not Detected			5	10
24) C1-C10 Hydrocarbons as hexane		2.870		19.313			Not Detected			5	10
25) C1-C4 Hydrocarbons as methane		2.870		4.097			Not Detected			5	10
26) C1-C4 Hydrocarbons as propane		2.870		4.097			Not Detected			5	10
27) C1-C4 Hydrocarbons as hexane		2.870		4.097			Not Detected			5	10
28) >C4-C10 Hydrocarbons methane		4.097		19.313			Not Detected			5	10
29) >C4-C10 Hydrocarbons propane		4.097		19.313			Not Detected			5	10
30) >C4-C10 Hydrocarbons hexane		4.097		19.313			Not Detected			5	10
1) MTBE	8.167(±0.03)	8.137	N.D.	8.197			Not Detected			0.5	1
2) Benzene	11.367(±0.06)	11.307	N.D.	11.427			Not Detected			0.5	1
3) Toluene	14.442(±0.03)	14.412	N.D.	14.472			Not Detected			0.8	1
4) Ethylbenzene	16.892(±0.04)	16.852	N.D.	16.932			Not Detected			0.4	1
5) m/p-Xylene	17.075(±0.04)	17.035	N.D.	17.115			Not Detected			0.7	2
6) o-Xylene	17.750(±0.04)	17.710	N.D.	17.790			Not Detected			0.7	2
7) Xylene (total)							Not Detected			0.7	2

Total number of FID targets = 21 Total number of PID targets = 7

Digitally signed by Jeffrey B. Smith on 06/03/2019 at 12:48. Target 3.5 esignature user ID: jbs01304

Secondary review performed and digitally signed by Jeffrey B. Smith on 06/13/2019 at 10:05. PARALLAX ID: jbs01304



Total Ion Chromatogram (TIC)

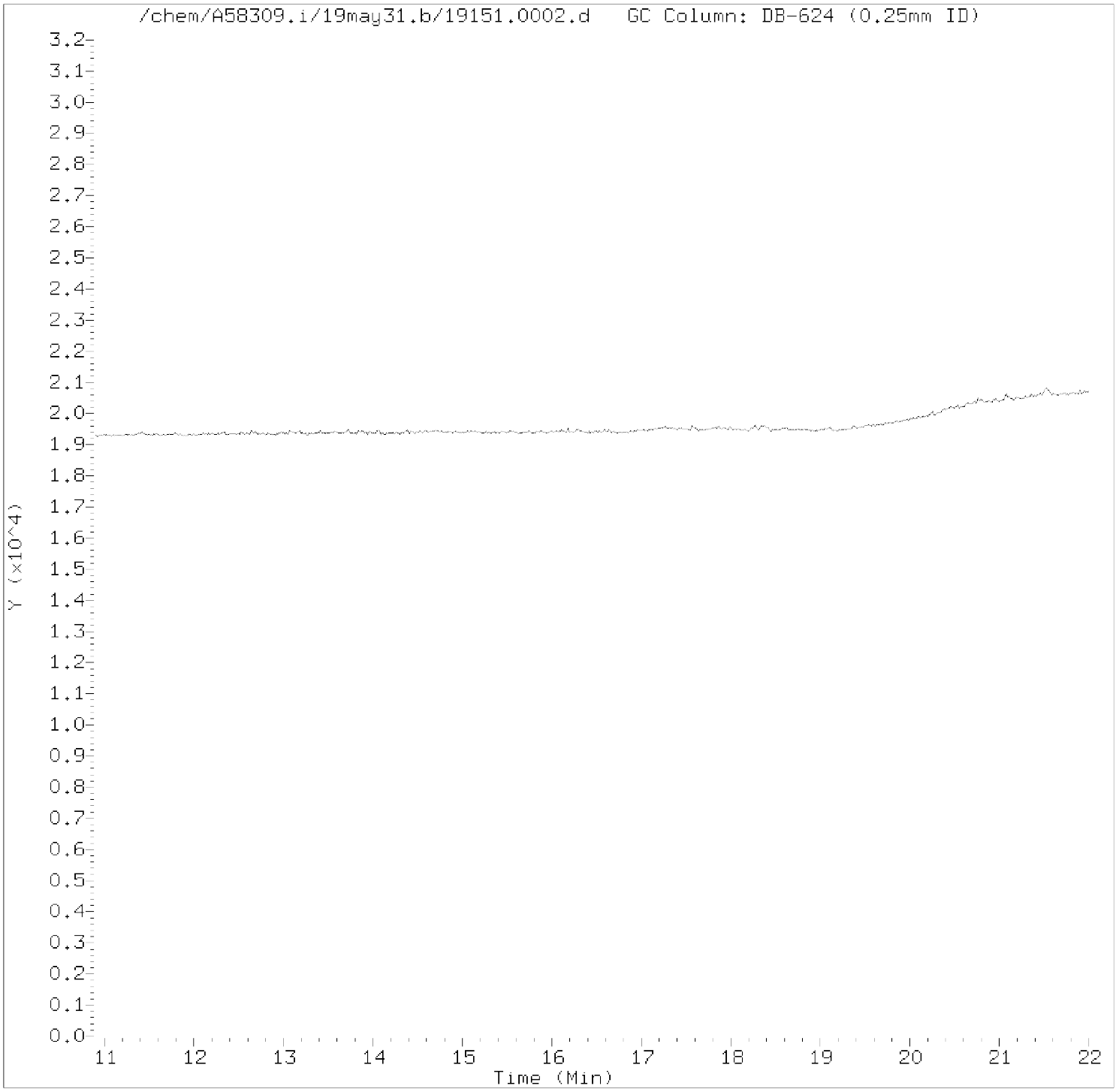
Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: blank
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: blank
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304

Quant Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: blank
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Single Component and Summary Compounds	Expected RT(±window)	RT	Area	On-Column Concentration (ppm(v))

No integrated signals resulted in on-column concentrations above the reporting limit.

Range Target Compounds	Range Start RT	Range End RT	Area	On-Column Concentration (ppm(v))

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

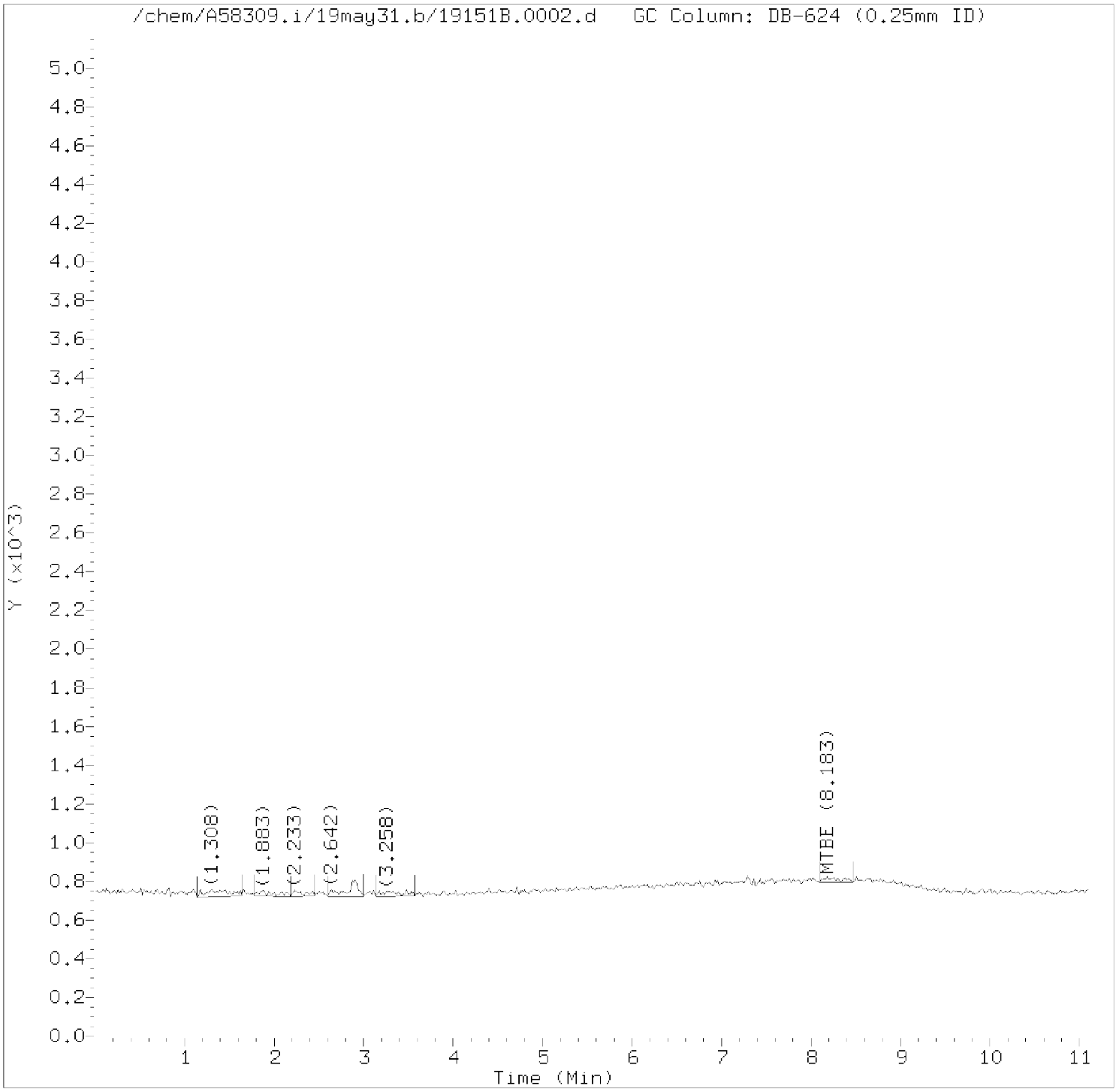
Data File: /chem/A58309.i/19may31.b/19151.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_fid.m Sublist used: blank
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

RT	Area	Peak Label(s) and Range	Compound #s
1.883	964		

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

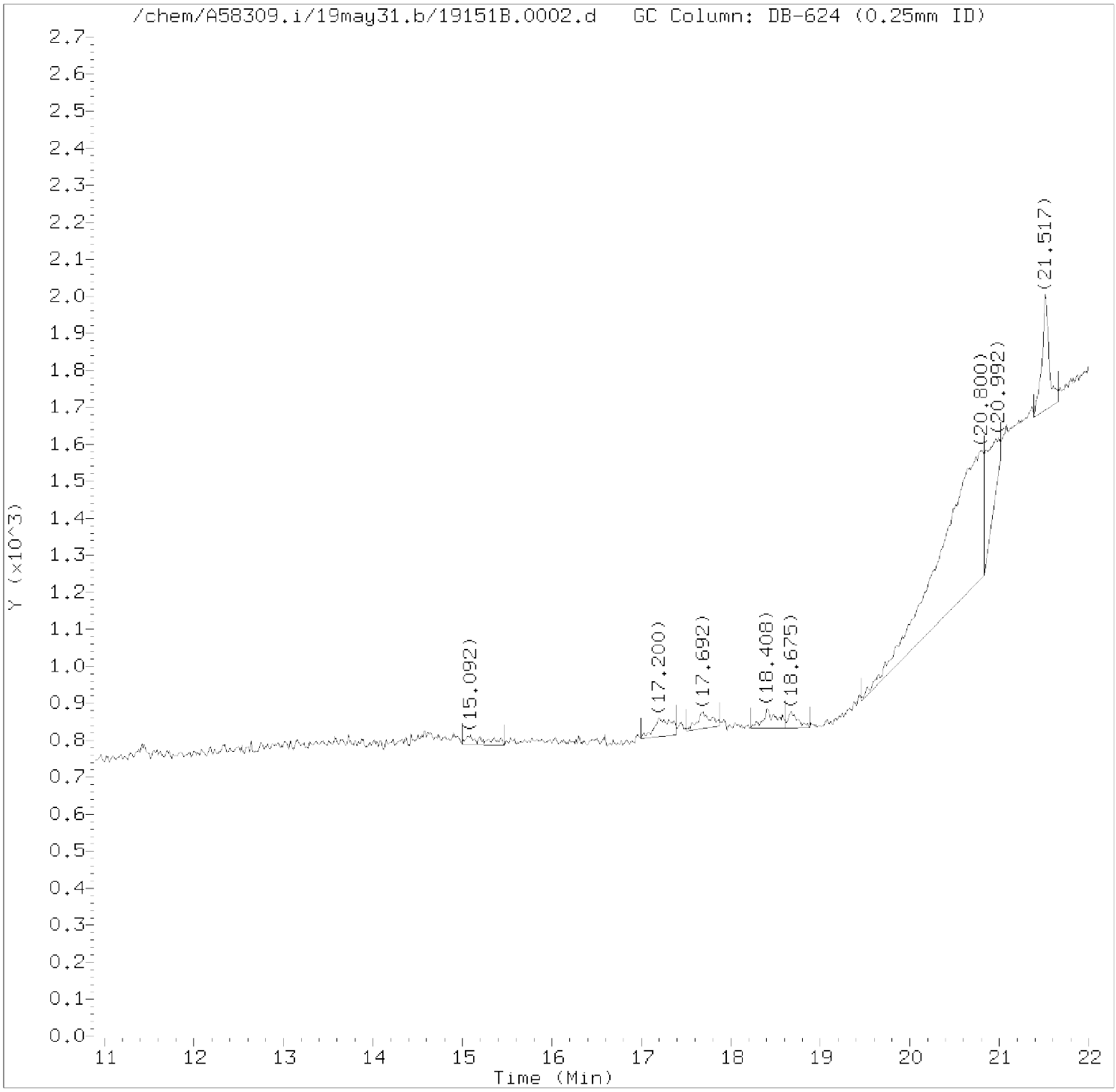
Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: 07090
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304



Total Ion Chromatogram (TIC)

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

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Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304

Quant Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: 07090
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

Single Component and Summary Compounds	Expected RT(±window)	RT	Area	On-Column Concentration (ppm(v))

No integrated signals resulted in on-column concentrations above the reporting limit.

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304

Tabular Peak Report

Target Revision 3.5

Data File: /chem/A58309.i/19may31.b/19151B.0002.d Instrument ID: A58309.i
Injection date and time: 31-MAY-2019 12:24 Analyst ID: jbs01304

Method used: /chem/A58309.i/19may31.b/gc_pid.m Sublist used: 07090
Calibration date and time: 03-JUN-2019 12:47
Date, time and analyst ID of latest file update: 03-Jun-2019 12:47 jbs01304

Sample Name: VBLK151 Lab Sample ID: VBLK151

RT	Area	Peak Label(s) and Range	Compound #s
1.308	676		
1.883	372		
2.233	277		
2.642	745		
3.258	418		
8.183	346	MTBE	
15.092	405		
17.200	671		
17.692	473		
18.408	567		
18.675	342		
20.800	11959		
20.992	2124		
21.517	1729		

Digitally signed by Jeffrey B. Smith
on 06/03/2019 at 12:48.
Target 3.5 esignature user ID: jbs01304

Laboratory Data Review Checklist

Completed by: Colleen Taggart

Title: Environmental Engineer 2

Date: August 1, 2019

CS Report Name: Effluent-A2-190524 Summa

Report Date: May 24, 2019

Consultant Firm: Arcadis U.S., Inc.

Laboratory Name: Eurofins Lancaster Laboratories Environmental

Laboratory Report Number: LSV62-2046101

ADEC File Number: 102.38.004

ADEC RecKey Number: 733

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ☑ Yes ☐ No

   Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ☐ Yes ☐ No ☑ N/A

   Comments:

   No analysis was sub-contracted

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No

   Comments:

   b. Correct analyses requested?

   ☑ Yes ☐ No

   Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☑ Yes ☐ No

Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☑ Yes ☐ No

Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

☐ Yes ☑ No

Comments: No sample containers were damaged

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐ Yes ☐ No ☑ N/A

Comments: No discrepancies were noted

e. Data quality or usability affected? Explain.

Comments: Data quality/usability was not affected

4. Case Narrative

a. Present and understandable?

☐ Yes ☑ No

Comments: There was no case narrative included in the report

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☑ No

Comments:

c. Were all corrective actions documented?

☐ Yes ☐ No ☑ N/A

Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality/usability was not affected

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☑ Yes ☐ No

Comments:

b. All applicable holding times met?

☑ Yes ☐ No

Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No ☑ N/A

Comments:

Soil not analyzed for this report

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☐ Yes ☐ No ☑ N/A

Comments:

No required PQLs required for effluent monitoring at this site.

e. Data quality or usability affected?

Comments:

Data quality/usability was not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☑ Yes ☐ No

Comments:

ii. All method blank results less than PQL?

☑ Yes ☐ No

Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A Comments:

No data was flagged

v. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☑ Yes ☐ No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable. No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A Comments:

vii. Data quality or usability affected? (Use comment box to explain)

Comments:

Data quality/usability was not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☐ Yes ☐ No ☑ N/A

Comments:

Surrogates are not required for air sample analysis.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☐ No ☑ N/A

Comments:

No surrogate recoveries were reported for air sample analysis.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☑ N/A

Comments:

No surrogate recoveries were reported for air sample analysis.

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Data quality/usability was not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and cooler?

☐ Yes ☑ No

Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☐ Yes ☐ No ☑ N/A

Comments:

No trip blank was submitted for air sample analysis.

iii. All results less than PQL?

☐ Yes ☐ No ☑ N/A

Comments:

Not applicable.

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☐ Yes ☑ No

Comments:

ii. Submitted blind to lab?

☐ Yes ☐ No ☑ N/A

Comments:

No field duplicate was submitted for air sample analysis.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☐ No ☑ N/A

Comments:

No field duplicate was submitted for air sample analysis.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality/usability was not affected.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

☐ Yes ☐ No ☑ N/A

i. All results less than PQL?

☐ Yes ☐ No ☑ N/A

Comments:

No field blank sample was submitted for air sample analysis.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? Explain.

Comments:

Data quality/usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☐ No ☑ N/A

Comments:

Results had no flags/qualifiers