Speedway Store 5314
(Former Tesoro 2 Go Mart #76)
ADEC File #2265.26.037

3Q - JULY 2021 GWM Event Report

Prepared For

Speedway

Stantec

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Test Method
amsl	above mean sea level
BTEX	benzene, toluene, ethylbenzene, and xylenes
Chemox	chemical oxidation
DO	dissolved oxygen
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GCL	groundwater cleanup level
gpm	gallons per minute
GRO	gasoline range organics
Klozur® One	Trademarked chemical oxidizer developed by PeroxyChem
mg/L	milligrams per liter
MW	monitoring well
PAH	polycyclic aromatic hydrocarbon
PQL	practical quantitation limit
ORP	oxidation-reduction potential
QA	quality assurance
QC	quality control
RW	remediation well
Speedway	Speedway, LLC
Stantec	Stantec Consulting Services, Inc.
Tesoro	Tesoro Refining and Marketing Company
TMB	Trimethylbenzene
UST	underground storage tank
VOC	Volatile Organic Compounds

1.0 EXECUTIVE SUMMARY

This third quarter 2021 monitoring event report was prepared by Stantec Consulting Services, Inc. (Stantec), on behalf of Speedway, LLC for Speedway Store 5314 (Tesoro 2 Go Mart #76), located at 3600 Palmer-Wasilla Highway, Wasilla, Alaska (**Figure 1**). The methods used for this monitoring event were conducted in accordance with the Alaska Department of Environmental Conservation (ADEC) approved 2021 Corrective Action Work Plan for this site.

This monitoring event was conducted on July 14, 2021, by John Marshall, Environmental Scientist, and Austin Badger, Engineer-In-Training, both with Stantec. The monitoring event included the following field activities: measuring the depth to groundwater; measuring water quality parameters; and collecting and analyzing groundwater samples from Monitoring Wells MW-1, MW-2, MW-3, MW-4, and Remediation Well RW19-1.

The laboratory analytical sample results showed petroleum associated analytes were present at concentrations exceeding ADEC groundwater cleanup levels (GCLs) as listed in Alaska Administrative Code (AAC) 18AAC 75.345 Table C (9/18/2019) for the following two monitoring wells:

- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, gasoline range organics (GRO), diesel range organics (DRO), 1,2,4-trimethylbenzene (TMB) and 1,3,5-TMB.
- Monitoring well MW-4: Benzene.

However, the laboratory reported the test results for naphthalene in all the wells were non-detections. The test method used was EPA 8260C, which has a reporting level above the ADEC GCL; consequently, the reported levels are shown as in exceedance of the GCL.

The hydraulic gradient across the site was found to be approximately 0.027 feet per foot directed toward the northwest at 344 degrees. The calculation by triangulation of groundwater hydraulic flow was based on the static water levels in the four on-site monitoring wells and the pumping water level in "pump and treat" well (RW 19-1) measured during the monitoring event on July 14. The groundwater gradient and flow direction are generally consistent with past monitoring events.

Upon arrival to the site on July 28, 2021, the well pump was discharging approximately 1.4 gallons per minute (gpm) into the three on-site treatment/remediation (injection) wells (RW-1, RW-2 and RW-3) that are located within the footprint of the former underground storage tank (UST). The well's submersible pump runs on a continuous basis (24 hours each day). The pumped groundwater is treated in-situ with a chemical oxidation (chemox) injection process.

On July 28, 2021, Stantec completed groundwater remediation event that included the injection of chemical oxidation (chemox) solution into the three treatment/remediation wells. The injection process involved the manual injection of a mixture of two 55-pound bags of Klozur One® product and 50 gallons of tap water into each of the three remediation wells. Following the injection of the chemox solution, Stantec injected additional 250 to 300 gallons of tap water into each remediation well to hydraulically push the chemox mixture into the subsurface formation.

2.0 SITE BACKGROUND

Background information for this site is summarized in **Appendix A**.

3.0 FIELD ACTIVITIES

The following field activities were conducted during this July 14, 2021, monitoring event:

- Measured the depth to groundwater in Monitoring Wells MW-1, MW-2, MW-3, and MW-4. In addition, the pumping water level in the remediation well RW 19-1 was measured. Groundwater depth measurements were used to calculate by triangulation method the hydraulic gradient and direction of flow of the groundwater table.
- Measured the following intrinsic water quality parameters in all five monitoring/remediation wells: pH, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP), and specific conductance.
- Collected groundwater samples from all five monitoring/remediation wells and submitted them for laboratory analysis of: U.S. Environmental Protection Agency (EPA) Method 8260C for petroleum fuel associated volatile organic compounds including benzene, toluene, ethylbenzene, and xylenes (BTEX); Alaska Test Method (AK)101 for GRO; AK102 for DRO, and metals (ICP) by Method 6010C for sodium.
- Subsequent to the quarterly monitoring event, on July 28 Stantec completed a dose of chemox treatment into the 3 remediation wells located in the footprint of the former UST. During the chemox injection process, Stantec completed an annual survey of all the on-site wells to re-establish the vertical elevations at the top of each well casing. In addition, Stantec removed the submersible pump in RM 19-1 to facilitate redevelopment of the well. Following well redevelopment, the pump was installed to a lower depth in the well and operated at various flow rates to achieve a desired rate of 5 gpm for optimization of the continuous pump and treat process.

Field methods and procedures are provided in **Appendix B**. Field measurements are provided in **Appendix C**. Details of the well redevelopment and pump testing in RW19-1 are included in **Appendix F**.

4.0 GROUNDWATER MONITORING RESULTS

4.1 GROUNDWATER ELEVATIONS

Table 1 presents groundwater elevations at this site based on the depths to static groundwater levels measured during this monitoring event. The flow from the pumping of RW19-1 was estimated at 1.4 gallons per minute (gpm) and the well discharge was split between the RW-1, RW-2 and RW-3 located in the "footprint" of the former underground storage tank (UST) shown on the site plan presented on Figure 2.

Table 1 Groundwater Elevations

Measured on July 14, 2021

Monitoring Well Identification	Top of Casing Elevation (feet above datum)[1]	Depth to Groundwater (feet btoc)	Groundwater Elevation (feet above datum)[1]
MW-1	94.72	21.80	72.92
MW-2	95.08	21.10	73.98
MW-3	94.53	18.59	75.94
MW-4	95.02	19.20	75.82
RW19-1	95.72	25.25	70.47

Key:
1 – Based on a vertical control survey of July 28, 2021, using an elevation datum of 100.00 feet established on the benchmark on the concrete base of the existing on-site drinking water well.
feet btoc – feet below top of monitoring well casing

On July 28, 2021, the submersible pump in RW19-1 was temporally removed to allow inspection of the well pump. The intake of the submersible pump was estimated to have been located at a depth approximately 25.5-feet below the top of the well casing which was just below the static water level in the well. The well was then re-developed by bailing of nearly 100 gallons from the well. After well development, the well pump was reinstalled to a deeper depth with the pump intake at approximately 27.5-feet below the top of casing. Additional groundwater elevation measurements were taken at different pumping rates. The pumping rate increased to a flow of 6.7 gpm. The well pump was operated at this rate for several days while the flow was discharged to injection well RW-3 located in the south end of the former UST "footprint". After a couple of days of pumping, the RW19-1 discharge rate was reduced to 5 gpm and the flow was discharged to RW-2 located in the center of the former UST "footprint".

Appendix F (titled "Well RW 19-1 Redevelopment and Pump Testing July and August 2021) presents a summary of the groundwater measurements collected during the test pumping of RW19-1 and nearby monitoring well MW-4 (see **Figure 2**). The water levels in the monitoring wells and RW19-1 will be measured in the future (probably a couple times a month to determine the impact on the groundwater table and assess the radius of influence of the recirculation well RW19-1 and mounding of groundwater in MW-4.

4.2 INTRINSIC WATER QUALITY PARAMETERS

Intrinsic water quality data collected during this monitoring event is presented in **Table 2**. The ORP measurements ranged from 88 millivolts (mV) in Monitoring Well MW-3 to 198 mV in Monitoring Well MW-1. The pH values in all of the wells were noted to be slightly acidic. Specific conductance readings ranged from 683 micro-Siemens per centimeter (µs/cm) to 1574 µs/cm which are similar to the previous monitoring event. DO measurements in all of the wells were noted to be low (anoxic).

Table 2 Intrinsic Water Quality Parameters
Measurements taken on July 14, 2021

Well ID	Volume Purged (gallons)	Sheen/ Odor	Temp. (˚C)	pH	Dissolved Oxygen[1] (mg/L)	ORP (mV)	Specific Conductance (µs/cm °C)
MW-1	1.47	N/N	7.2	5.74	0.20	198	1350
MW-2	3	N/N	5.0	6.25	0.27	174	735
MW-3	3.45	N/N	5.0	6.53	0.51	88	1135
MW-4	3.7	N/N	7.0	6.4	0.46	126.3	1574
RW19-1	NM	N/N	NM	6.38	NM	118	683

Key:
ºC – degrees Celsius
µS/cm°C – microSiemens per centimeter ºC
mg/L – milligrams per liter
mV – millivolts
N – no
1 – Dissolved oxygen calibration out of range.
ORP – oxidation-reduction potential
pH – -log [H+]
SC – specific conductance at 25ºC
Temp. – temperature
Y – yes
NM – Not Measured

4.3 ANALYTICAL WATER QUALITY DATA

Historical monitoring data for this site are tabulated in **Appendix D**. Laboratory analytical results for BTEX, GRO, DRO, sodium, naphthalene, 1,2,4-TMB and 1,3,5-TMB detected in groundwater samples collected during this monitoring event are summarized in **Tables 3a and 3b.** The complete laboratory analytical report and laboratory data review checklist is provided in **Appendices E-1 and E-2**.

Table 3a Groundwater Analytical Results for BTEX, GRO, and DRO

Samples collected on July 14, 2021

Sample Identification	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-1	0.00177	U (0.00100)	U (0.00100)	U (0.00300)	U (0.100)	0.317 B,J
MW-2	0.00399	U (0.00100)	0.00193	0.00465	0.0504 B,J	0.272 B,J
MW-3	**0.541**	0.156 J	**2.47**	**12.87 C5**	**30.3**	**3.59 B**
MW-4	**0.0176**	U (0.00100)	0.000375 J	0.00383 C5	0.0682 B,J	0.371 B,J
RW 19-1	U (0.00100)	U (0.00100)	U (0.00100)	U (0.00300)	U (0.100)	0.297 B,J
DUP01 (dup. of MW-3)	**0.581**	0.144	**2.65**	**12.55**	**24.1 B**	**3.87 B**
Trip Blank	U (0.00100)	U (0.00100)	U (0.00100)	U (0.00300)	NM	NM
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**

Table 3b Groundwater Analytical Results for Naphthalene, Trimethylbenzene (TMB) and Sodium

Samples collected on July 14, 2021

Sample Identification	Naphthalene (mg/L)	1,2,4-TMB (mg/L)	1,3,5-TMB (mg/L)	Sodium (mg/L)
MW-1	**U (0.00500) C3**	U (0.00100)	U (0.00100)	32.2
MW-2	**U (0.00500) C3**	0.00487	0.00107	32.8
MW-3	**U (1.00)**	**2.16**	**0.594**	49.8
MW-4	**U (0.00500)**	0.00374	0.000529 J	76.7
RW 19-1	**U (0.00500)**	U (0.00100)	U (0.00100)	28.8
DUP01 (dup. of MW-3)	**U (0.500)**	**2.48**	**0.683**	50.1
Trip Blank	**U (0.00500)**	U (0.00100)	U (0.00100)	NM
GCLs	**0.0017**	**0.056**	**0.060**	**NA**

Key:
AK – Alaska Test Method
BTEX – benzene, toluene, ethylbenzene, and xylenes
DRO – Diesel range organics, analyzed by AK102
TMB - Trimethylbenzene
GCLs – Groundwater cleanup levels, per ADEC 18 AAC 75.345, Table C, updated September 29, 2018.
GRO – Gasoline range organics, analyzed by AK101
mg/L – milligrams per liter
U – Undetected above laboratory reporting limits shown in parentheses.
Dup. – Duplicate
B – The same analyte is found in the associated blank.
C3 – The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
C5 – The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result.
J – The identification of the analyte is acceptable; the reported value is an estimate.
NM – Not measured.

Bold indicates the concentration exceeds the GCL or, if not detected, the practical quantitation limit exceeds the GCL.

4.4 QUALITY ASSURANCE (QA)/ QUALITY CONTROL (QC) REVIEW

Pace analytical performed all analysis of groundwater samples for this sampling event. **Table 4** provides a summary of the laboratory QC objectives and outcomes for this monitoring event. Laboratory QC data and the ADEC Laboratory Data Review Checklist are included with the laboratory report in **Appendix E-2**.

A duplicate sample set was collected to determine the precision of the field collection and laboratory analyses for this sampling event. Sample DUP01 is a duplicate of sample MW-3. The data presented in **Table 4** shows that the precision for the duplicate sample set (analytes that were detected above the practical quantitation limit [PQL] and exceeded GCLs) was within the established QA criteria tolerances for all analytes.

Table 4 Laboratory Quality Control Objectives

Quality Control Designation	Tolerance	Results for this Event
Holding Times		
DRO/Water/to analyze	40 days	13 days[1]
DRO/Water/to extract	14 days	9 days
GRO/Water/to analyze	14 days	14 days
BTEX/Water/to analyze	14 days	4-14 days[2]
Field Duplicates – Precision		
Benzene/Water	± 30%	7.1 %
Toluene/Water	± 30%	8.0 %
Ethylbenzene/Water	± 30%	7.0 %
Xylenes/Water	± 30%	0.16 %
GRO/Water	± 30%	23 %
DRO/Water	± 30%	7.5 %

Key:
% – percent
± – plus or minus
BTEX – benzene, toluene, ethylbenzene, and xylenes
DRO – diesel range organics
GRO – gasoline range organics
NC – Not computed due to non-detectable levels in original and/or duplicate samples
1 – DRO samples at MW-1 and MW-4 were analyzed 14 days from collection.
2 – BTEX samples at MW-1 and MW-2 were analyzed 4 days from collection, samples at MW-4 and MW-19 5 days, MW-3 was analyzed 6 days from collection, and the duplicate sample was analyzed for BTEX 14 days from collection.

5.0 REMEDIATION SYSTEM

The "Pump and Treat" groundwater remediation system uses the submersible pump in RW 19-1 for the continuous (24-hours per day) recirculation of groundwater. Currently, the pump is discharging at a constant rate of 5 gpm into remediation wells RW-2 located under the store building in the center of the footprint of the former UST (**Figure 2**).

The re-circulation of pumped groundwater from RM 19-1 is coupled with periodic injection (typically on a quarterly basis and a monthly basis during the non-freeze time of year) of a chemox product that is injected into the three remediation wells. On July 28, 2021, Stantec completed a chemox injection of two 55-pound bags of Klozur One® product mixed with 50 gallons of tap water was injected into each of the three remediation wells of the former bio-sparge system (RW-1, RW-2, and RW-3). Following the injection of the chemox solution, Stantec injected additional 250 to 300 gallons of tap water into each remediation well. The next scheduled injection of chemox into the treatment wells is planned for late August 2021.

6.0 DISCUSSION OF FINDINGS

Historical results for the current and previous monitoring events are presented in **Appendix D**. The laboratory analytical sample results showed petroleum associated analytes were present at concentrations exceeding ADEC groundwater cleanup levels (GCLs) as listed in Alaska Administrative Code (AAC) 18AAC 75.345 Table C (9/18/2019) for the following two monitoring wells:

- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, gasoline range organics (GRO), diesel range organics (DRO), 1,2,4-TMB and 1,3,5-TMB.
- Monitoring well MW-4: Benzene.

However, the laboratory reported the test results for naphthalene in all the wells were non-detections. The test method used was EPA 8260C which has a reporting level above the ADEC GCL; consequently, the reported levels are shown as in exceedance of the GCL.

The average hydraulic gradient across the site was found to be approximately 0.027 feet per foot directed toward the northwest at 344 degrees. The calculation by triangulation of groundwater hydraulic flow was based on the static water levels in the four on-site monitoring wells and the

pumping water level in “pump and treat” well (RW 19-1) measured during the monitoring event. The groundwater gradient and flow direction are generally consistent with past monitoring events.

7.0 CONCLUSIONS AND RECOMMENDATIONS

No anomalies were found during the 3Q July 2021 monitoring event at this site that would require additional corrective action or changes to the ADEC-approved year 2021 Corrective Action Work Plan for this site.

8.0 LIMITATIONS

Stantec conducted this monitoring event in accordance with the 2021 Corrective Action Work Plan approved by ADEC, and in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. All sampling activities were completed in accordance with the ADEC *Underground Storage Tanks Procedures Manual – Standard Sampling Procedures* (March 22, 2017). No other warranty, expressed or implied, is made. Data and recommendations made herein were prepared for Speedway Store 5314 (Tesoro 2 Go Mart #76) and Speedway, LLC. Information herein is for use at this site in accordance with the purpose of the report described.

FIGURES

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SPEEDWAY STORE 5314
(FORMER TESORO 2 GO MART #76)

3Q - JULY 2021 GWM EVENT REPORT

LOCATION AND VICINITY MAP

FIGURE

1

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E. PALMER WASILLA HWY

APPROXIMATE LOCATION OF PROPERTY LINE
3600 PALMER-WASILLA HWY

WATER SUPPLY WELL LOCATION (W)

UNDERGROUND STORAGE TANK

CANOPY

FUEL DISPENSER (TYP)

SEPTIC SYSTEM

SEWARD MERIDIAN PKWY

CAR WASH

TESORO
2 GO MART #76

UNDERGROUND PIPING

REMEDIATION WELL ACCESS POINT

F-UST

MW-1

MW-2

MW-3

MW-4

RW1

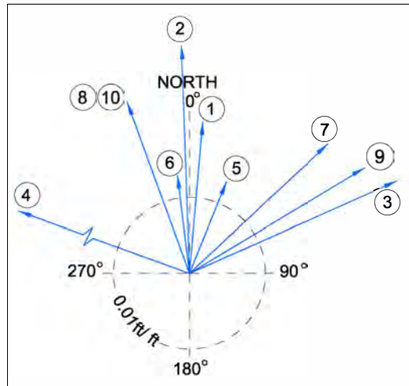
RW2

RW3

RW19-1

CAMERON ACRES
BLOCK 1
LOT 7

APPROXIMATE
0 20'



GROUNDWATER FLOW SUMMARY

	DATE	BEARING	GRADIENT (ft/ft)
1	SEP. 11, 2018	5°	0.02
2	OCT. 26, 2018	358°	0.03
3	FEB. 25, 2019	66°	0.03
4	APRIL 25, 2019	290°	0.04
5	JULY 25, 2019	22°	0.013
6	OCT. 18, 2019	353°	0.013
7	AUG. 11, 2020	47°	0.025
8	MARCH 23, 2021	340°	0.024
9	MAY 19, 2021	59°	0.027
10	JULY 14, 2021	344°	0.027

MW-1

Benzene	0.00177
Toluene	U (0.00100)
Ethylbenzene	U (0.00100)
Xylenes	U (0.00300)
GRO	U (0.100)
DRO	0.317
Naphthalene	**U (0.00500)**
1,2,4-TMB	U (0.00100)
1,3,5-TMB	U (0.00100)
Sodium	32.2
GW Elev	72.92

MW-2

Benzene	0.00399
Toluene	U (0.00100)
Ethylbenzene	0.00193
Xylenes	0.00465
GRO	0.0504
DRO	0.272
Naphthalene	**U (0.00500)**
1,2,4-TMB	0.00487
1,3,5-TMB	0.00107
Sodium	32.8
GW Elev	73.98

RW19-1

Benzene	U (0.00100)
Toluene	U (0.00100)
Ethylbenzene	U (0.00100)
Xylenes	U (0.00300)
GRO	U (0.100)
DRO	0.297
Naphthalene	**U (0.00500)**
1,2,4-TMB	U (0.00100)
1,3,5-TMB	U (0.00100)
Sodium	28.8
GW Elev	70.47

MW-4

Benzene	**0.0176**
Toluene	U (0.00100)
Ethylbenzene	0.000375
Xylenes	0.00383
GRO	0.0682
DRO	0.371
Naphthalene	**U (0.00500)**
1,2,4-TMB	0.00374
1,3,5-TMB	0.000529
Sodium	76.7
GW Elev	75.82

MW-3

Benzene	**0.541**
Toluene	0.156
Ethylbenzene	**2.47**
Xylenes	**12.87**
GRO	**30.3**
DRO	**3.59**
Naphthalene	**U (1.00)**
1,2,4-TMB	**2.16**
1,3,5-TMB	**0.594**
Sodium	49.8
GW Elev	75.94

MW-3 (Duplicate)

Benzene	**0.581**
Toluene	0.144
Ethylbenzene	**2.65**
Xylenes	**12.55**
GRO	**24.1**
DRO	**3.87**
Naphthalene	**U (0.500)**
1,2,4-TMB	**2.48**
1,3,5-TMB	**0.683**
Sodium	50.1
GW Elev	75.94

LEGEND:

F-UST	FORMER UNDERGROUND STORAGE TANK
▲	MONITORING WELL LOCATION
●	REMEDIATION WELL LOCATION
DRO	DIESEL RANGE ORGANICS
GRO	GASOLINE RANGE ORGANICS
GW Elev	GROUNDWATER ELEVATION IN FEET
RW	REMEDIATION WELL
TMB	TRIMETHYLBENZENE
U	UNDETECTED ABOVE PRACTICAL QUANTITATION LIMITS SHOWN IN PARENTHESES
(W)	DRINKING WATER WELL

NOTES:

1. RESULTS SHOWN ARE FOR WELLS SAMPLED ON JULY 14, 2021.
2. RESULTS ARE IN MILLIGRAMS PER LITER
3. BOLD/ RED TEXT INDICATES CONTAMINANT CONCENTRATIONS ABOVE CLEANUP LEVELS FOR THIS SITE

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SPEEDWAY STORE 5314
(FORMER TESORO 2 GO MART #76)
3Q - JULY 2021 GWM EVENT REPORT

SITE PLAN
WITH GROUNDWATER
ANALYTICAL RESULTS

FIGURE
2
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FILE: C:\D\CAD\Proj\Speedway_Tesoro\Speedway 5314 (TGMart076)_185705377\MonEvent\2021\Q3_July 2021\Fig02_Site Plan with GrndWtr.dgn
TIME: 11-AUG-2021 12:06

APPENDIX A

Site Background

APPENDIX A – SITE BACKGROUND

Speedway Store 5314 (former Tesoro 2 Go Mart #76) located at 3600 Palmer-Wasilla Highway, Wasilla, Alaska
ADEC File #100.26.159

Speedway Store 5314 (former Tesoro 2 Go Mart #76) is a retail fuel and convenience store facility located at 3600 Palmer-Wasilla Highway, Wasilla, Alaska (Figure 1). The legal description for the property is Lot 7, Block 1, Cameron Acres Subdivision, Matanuska-Susitna Borough.

Two 15,000-gallon underground storage tanks (USTs) were installed at the site in 1995. Based on historical records, this is the first retail fuel convenience store to occupy this location. The site is covered with asphalt paving with concrete in the area over the USTs and fuel dispenser islands. The former UST system and dispensing components were removed from September to October 2014 and replaced with a new UST fueling system. The new UST fueling system consists of two 15,000-gallon fiberglass-reinforced plastic, double-walled USTs installed on January 29, 2015, and seven fuel dispensers (six gasoline and one diesel). Distribution piping consists of 2-inch fiberglass primary and 3-inch fiberglass secondary.

In addition, the former convenience store was demolished and replaced with a new convenience store that was constructed at a different location on the property. The property is over 1 acre in size and is served with an on-site drinking water well and on-site septic tank and drainfield system.

October 2014. During the 2014 Site Assessment of the UST closure, a petroleum fuel release was discovered in the subsurface soils partially surrounding and underlying the USTs. At that time, a very deep test pit was excavated beneath the former USTs to the groundwater table. Field screening with a photoionization detector (PID) indicated that petroleum contamination was present throughout the vadose zone and extended to the underlying groundwater table. Due to site safety concerns with sloughing soils, it was not feasible to excavate all of the contaminated soil below the former USTs.

A Release Investigation (RI) was conducted by MWH Americas, Inc. (MWH) subsequent to the closure of the former USTs. The RI included the installation of a soil vapor extraction (SVE) remediation well and several groundwater monitoring wells. MWH completed a groundwater monitoring event after the monitoring wells were installed. Follow-up water samples were collected from the onsite drinking water well for appropriate laboratory analyses.

The findings of the RI indicated a significant amount of petroleum contamination had impacted the subsurface soils and shallow groundwater table at the site. The soil samples collected indicate higher concentrations of gasoline range organics (GRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) constituents directly below the location occupied by the former USTs at Remediation Wells RW-2 and RW-3. Benzene was detected above Alaska Department of Environmental Conservation (ADEC) groundwater cleanup level (GCL) in groundwater at monitoring wells installed at the site. GRO contaminants have also impacted the groundwater table. The system has been monitored on a quarterly basis since the completion of the RI.

February 2015. Benzene exceeded the GCL in Monitoring Well MW-2. BTEX, GRO, and diesel range organics (DRO) exceeded GCLs in Monitoring Well MW-3. Benzene, toluene, and GRO exceeded GCLs in Monitoring Well MW-4.

June 2015. MWH installed and placed into operation a SVE system at the site. Early results indicate that the system is effectively removing petroleum-related vapors from the subsurface. Additionally, a surface water sample was collected from an on-site nearby wetland surface water area. Xylenes and DRO were detected in the water sample; however, the concentrations were below the ADEC groundwater and surface water cleanup levels.

September 2015. Benzene and DRO exceeded GCLs in Monitoring Well MW-2. BTEX and DRO exceeded GCLs in Monitoring Well MW-3. Benzene exceeded GCL in Monitoring Well MW-4. The SVE remediation system blower was offline, requiring maintenance.

November 2015. Benzene exceeded GCL in Monitoring Well MW-1. Benzene, GRO, and DRO exceeded the GCL in Monitoring Well MW-2. Benzene, toluene, and GRO all remained above their GCLs, consistent with the past five monitoring events, at Monitoring Well MW-3.

December 2015. Maintenance was performed on the SVE system on December 31, 2015. A replacement SVE system blower was installed. The system was brought back online on the date of the replacement blower installation. A PID was used to monitor the system effluent after the initial 15 minutes of operation and indicated that 424 parts per million by volume were being removed by the system.

January 2016. Benzene exceeded the GCL in Monitoring Well MW-1. Benzene, toluene, ethylbenzene, and DRO exceeded their GCLs in Monitoring Well MW-2; and benzene, toluene, ethylbenzene, xylenes, GRO, and DRO exceeded their GCLs in Monitoring Well MW-3. The laboratory did not provide results for requested GRO analyses for samples from Monitoring Wells MW-2 and MW-4.

May 2016. In Monitoring Wells MW-1, MW-2, and MW-4, only benzene exceeded GCL. MW-3 exceeded GCLs for all analytes tested. There were no detections in the Carmen Lot 7 drinking water sample. An SVE effluent sample was collected to monitor SVE performance.

October 2016. In Monitoring Well MW-1, only benzene exceeded GCL. In Monitoring Well MW-2, all analytes but toluene and DRO exceeded GCLs. Monitoring Well MW-3 exceeded GCLs for all analytes tested. Monitoring Well MW-4 had no exceedances. There were no detections in the Carmen Lot 7 drinking water sample. An SVE effluent sample was collected to monitor SVE performance.

December 2016. In Monitoring Well MW-1, only benzene exceeded GCL. In Monitoring Well MW-2, all analytes but toluene exceeded GCLs. Monitoring Well MW-3 exceeded GCLs for benzene, GRO, and DRO. Monitoring Well MW-4 and the Carmen Lot 7 drinking water sample had no exceedances. Both Monitoring Wells MW-3 and MW-4 had insufficient sample volumes to complete all analytical testing. The SVE system observed for operation and performance.

February 2017. Benzene was the only analyte to exceed the GCL in Monitoring Wells MW-1 and MW-4. Benzene and ethylbenzene exceeded GCLs in Monitoring Well MW-2, and all analytes exceeded their GCLs in Monitoring Well MW-3. The SVE system was frozen due to record cold temperatures experienced during January 2017. A subsequent site visit on February 16, 2017, was made to thaw and restore the SVE system to normal operation.

April 2017. In addition to testing for BTEX, DRO, and GRO, expanded testing for volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PAHs) were conducted on all monitoring wells. Benzene was the only analyte to exceed the GCL in Monitoring Wells MW-1 and MW-4. BTEX (minus toluene) and GRO exceeded their GCLs in Monitoring Well MW-2, consistent with previous monitoring events. The expanded testing found 1,2,4-trimethlybenzene and naphthalene to also exceed GCLs. In Monitoring Well MW-3, BTEX and DRO exceeded their GCLs, also consistent with previous monitoring events. The expanded testing found 1,2,4-trimethlybenzene, 1,3,5-trimethlybenzene, and naphthalene to also exceed GCLs. Pilot Testing (conducted in May 2017) of air injection into remediation wells to volatize groundwater and smear zone contaminants indicated a slight increase of volatilization when air is injected into RW-2, and RW-3.

September 2017. Except for the following, all analytes were below GCLs in the wells sampled:

- Monitoring Well MW-1 – benzene exceeded the GCL.
- Monitoring Well MW-2 – benzene, ethylbenzene, xylenes and GRO exceeded their GCLs.
- Monitoring Well MW-3 – BTEX, GRO, and DRO were above their GCLs. The MW-3 duplicate sample provided results within established Quality Assurance/Quality Control (QA/QC) standards.
- Monitoring Well MW-4 – benzene, ethylbenzene, xylenes, and GRO exceeded their GCLs.

The SVE contaminant vapor mass removal was less than observed during pilot test in May 2017 and requires additional optimization.

February 2018. Except for the following, all analytes were below GCLs in the wells sampled:

- Monitoring Well MW-1 – benzene.
- Monitoring Well MW-2 – benzene, ethylbenzene, xylenes, and GRO (GRO was not detected, but the Reporting Limit exceeded the GCL).
- Monitoring Well MW-3 – BTEX and GRO (GRO was not detected, but the Reporting Limit exceeded the GCL). The MW-3 duplicate sample provided results within established QA/QC standards.
- Monitoring Well MW-4 – benzene, ethylbenzene, xylenes, and GRO.

The SVE contaminant vapor mass removal was less than previously observed on site. In addition, the field work included an assessment of the buried piping systems for the air sparging (AS) and SVE systems. The assessment was performed with a downhole camera capable of recording

photographs and video of the interior conditions of the piping system. The findings of the downhole camera assessment of the buried piping system was inconclusive.

June 2018. The results from the June 29, 2018, monitoring event supports the continued pattern that GRO contamination persists on site and is observed in Monitoring Wells MW-2 and MW-3. In addition, Monitoring Well MW-3 is consistently the most contaminated well. In summary, the results of the groundwater analytical sampling showed that analytes detected above the GCLs were:

- Monitoring Well MW-1: Benzene.
- Monitoring Well MW-2: Benzene, ethylbenzene, xylenes, GRO, and naphthalene.
- Monitoring Well MW-3: BTEX, GRO and naphthalene. Except for GRO, the duplicate sample provided results within established QA/QC standards.
- Monitoring Well MW-4: Benzene, ethylbenzene, and naphthalene.

A representative water sample from the on-site drinking water well serving the Tesoro 2 Go Mart was sampled and tested for VOCs. The water sample was found to have no detectable levels of contaminants of concern, except the laboratory reporting limits were over the GCLs for 1,1,2-trichloroethane (TCA) and vinyl chloride.

The SVE contaminant vapor mass removal is very low and based on the recent pattern of decline suggest that the SVE system performance requires additional optimization. Alternative treatment options are currently being evaluated and, if determine feasible, a new work plan will be presented to ADEC for review and approval prior to making any changes.

September 2018. Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs were:

- Monitoring Well MW-1: Benzene.
- Monitoring Well MW-2: Benzene, ethylbenzene, xylenes, GRO, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
- Monitoring Well MW-3: Benzene, ethylbenzene, xylenes, GRO, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
- Monitoring Well MW-4: Benzene, and 1,2,4-trimethylbenzene.

Several analytes for VOCs were reported as undetected but had laboratory reporting limits that equaled or exceeded their corresponding GCLs. The results from this monitoring event supports the continued pattern that GRO contamination persists at the site and is observed in Monitoring Wells MW-2 and MW-3. In addition, Monitoring Well MW-3 is consistently the most contaminated well.

The approximate hydraulic gradient across the site was found to be approximately 0.03 feet per foot directed toward the north-northeast at 14 degrees. The groundwater flow direction and gradient are consistent with past monitoring events.

The SVE contaminant vapor mass removal is very low and, based on the recent pattern of decline, suggests that the SVE system performance requires additional optimization. Alternative treatment options are currently being evaluated and, if determine feasible, a new work plan will be presented to ADEC for review and approval prior to making any changes.

October 2018. Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs were:

- Monitoring Well MW-1: Benzene.
- Monitoring Wells MW-2 and MW-3: Benzene, ethylbenzene, xylenes, GRO, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
- Monitoring Well MW-4: Benzene.

Several VOCs were reported as undetected but had laboratory reporting limits that equaled or exceeded their corresponding GCLs. The results from this October 26, 2018, monitoring event supports the continued pattern that GRO contamination persists at the site and is observed in Monitoring Wells MW-2 and MW-3. In addition, Monitoring Well MW-3 is consistently the most contaminated on-site monitoring well.

The approximate hydraulic gradient across the site was found to be approximately 0.03 feet per foot directed toward the north at 358 degrees. The groundwater flow direction and gradient are consistent with past monitoring events.

The SVE contaminant vapor mass removal is very low and, based on the recent pattern of decline, suggests that the SVE system performance requires additional optimization. Alternative treatment options are currently being evaluated and, if determined to be feasible, a new work plan will be presented to ADEC in 2019 for review and approval prior to making any changes.

February 2019. Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs were:

- Monitoring Well MW-2: Benzene, ethylbenzene, xylenes, and GRO.
- Monitoring Well MW-3: Benzene, ethylbenzene, xylenes, and DRO.
- Monitoring Well MW-4: Benzene

The existing bio-sparge treatment system is not functional and will be replaced. In the 2nd quarter of 2019, Stantec plans to install a groundwater recirculation system based on pump and treat technology. The SVE contaminant vapor mass removal is very low and, based on the recent pattern of decline, suggests that the SVE system performance requires additional optimization. Alternative treatment options are currently being evaluated and, if determine feasible, a new work plan will be presented to ADEC for review and approval prior to making any changes.

April 2019. The monitoring event included: measuring the depth to groundwater; measuring water quality parameters; and collecting and analyzing groundwater samples from Monitoring Wells MW-1, MW-2, MW-3, and MW-4, as well as the on-site drinking water well.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring Well MW-2: Benzene, xylenes, GRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene.
- Monitoring Well MW-3: Benzene, GRO, and naphthalene.

A representative water sample from the on-site drinking water well serving the Tesoro 2Go Mart was sampled and tested for VOCs. The water sample was found to have no detectable levels of contaminants of concern, except the laboratory reporting limits were over the GCLs for 1,1,2-TCA, 1,2,3-trichloropropane, 1,2-dibromoethane, and vinyl chloride.

The groundwater hydraulic gradient across the site was found to be approximately 0.04 feet per foot directed toward the west-northwest at 290 degrees. The groundwater flow direction and gradient are inconsistent with past monitoring events in that the direction of flow is to the west rather than historically to the north with a slightly higher gradient.

July 2019. The monitoring event included: measuring the depth to groundwater; measuring water quality parameters; and collecting and analyzing groundwater samples from Monitoring Wells MW-1, MW-2, MW-3, and MW-4.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring Well MW-1: Benzene.
- Monitoring Well MW-2: Benzene, ethylbenzene, xylenes, and GRO.
- Monitoring Well MW-3: BTEX, GRO, and DRO.
- Monitoring Well MW-4: Benzene.

The groundwater hydraulic gradient across the site was found to be approximately 0.013 feet per foot directed toward the north-northeast at 22 degrees. The groundwater flow direction and gradient are consistent with past monitoring events.

Stantec plans to drill a new 4" diameter remediation well and repurpose the current bio-sparge system. The new well and bio-sparge system will be converted into a groundwater recirculation system to allow injection of chemical oxidation products. The implementation of this change in the remediation system will occur in the 4th quarter of 2019.

October 2019. The monitoring event included: measuring the depth to groundwater; measuring water quality parameters; and collecting and analyzing groundwater samples from Monitoring Wells MW-1, MW-2, MW-3, and MW-4.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring Well MW-2: Benzene and ethylbenzene.

- Monitoring Well MW-3: benzene, ethylbenzene, xylenes, and GRO.
- Monitoring Well MW-4: Benzene.

The groundwater hydraulic gradient across the site was found to be approximately 0.013 feet per foot directed toward the north at 350 degrees. The groundwater flow direction and gradient are consistent with past monitoring events.

Stantec plans to drill a new 4" diameter remediation well (RW 19-1) and repurpose the current bio-sparge system. The new well and bio-sparge system will be converted into a groundwater recirculation system to allow injection of chemical oxidation products. The implementation of this change in the remediation system will occur in the 2nd quarter of 2020.

August 2020. The 3rd quarter groundwater monitoring event included: measuring the depth to groundwater; measuring water quality parameters; and collecting and analyzing groundwater samples from Monitoring Wells MW-1, MW-2, MW-3, MW-4, and Remediation Well RW19-1.

Results of the groundwater analytical sampling showed that analytes detected above ADEC groundwater cleanup levels (GCLs) in the primary samples were:

- Monitoring Well MW-2: Benzene, ethylbenzene, and xylenes.
- Monitoring Well MW-3: Benzene, ethylbenzene, xylenes, gasoline range organics (GRO), and diesel range organics (DRO).
- Monitoring Well MW-4: Benzene.

The hydraulic gradient across the site was found to be approximately 0.025 feet per foot directed toward the north at 47 degrees. The groundwater flow direction and gradient are consistent with past monitoring events. A historical summary of the groundwater flow for the last 10 monitoring events is shown in the "rose diagram" presented on the Site Plan drawing.

In 2019 Stantec installed a groundwater recirculation system based on pump and treat technology. The 4" diameter remediation well (RW 19-1) that was installed in October 2019, is connected to the existing underground piping system (formerly used for the bio-sparge system) consisting of 3 vertical injection wells located under the northeast portion of the existing store building. Chemical oxidation injection of Klozur One® product directly into the 3 vertical injection wells was conducted during this monitoring event. A total of 330 pounds of Klozur One® and 750 gallons of water pumped from RW19-1 was injected into the in-situ groundwater treatment system.

October 2020. The 4th quarter groundwater monitoring event included: measuring the depth to groundwater; measuring intrinsic water quality parameters; and collecting and analyzing groundwater samples from monitoring wells MW-01, MW-02, MW-03, MW-04 and remediation well RW19-1.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring well MW-1: Benzene

- Monitoring well MW-2: Benzene, ethylbenzene, and 1,2,4-trimethylbenzene.
- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, gasoline range organics (GRO), diesel range organics (DRO), naphthalene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.
- Monitoring well MW-4: Benzene.

No contaminants were detected in the drinking water sample collected from the water spigot in the store's utility sink.

The hydraulic gradient across the site was found to be approximately 0.032 feet per foot directed toward the north-east at 28 degrees. The groundwater flow direction and gradient are consistent with past monitoring events. A historical summary of the groundwater flow for the last 11 monitoring events is shown in the "rose diagram" presented on the Site Plan drawing.

On September 3, 2020 - prior to the 4th quarter groundwater monitoring event, Stantec completed an injection of chemox products. A chemox solution consisting of two 55-pound bags of Klozur One® product mixed with 50 gallons of water was injected into each of the three remediation wells of the former bio-sparge system (RW-1, RW-2, and RW-3). An additional 200 gallons of water from RW19-1 was injected directly into each remediation well (RW-1, RW-2, and RW-3) immediately after the injection of the chemox solution. In summary, a total of 330 pounds of Klozur One® and 750 gallons of water pumped from RW19-1 was injected into the in-situ groundwater treatment system.

March 2021. The 1st quarter 2021 groundwater monitoring event included: measuring the depth to groundwater; measuring intrinsic water quality parameters; and collecting and analyzing groundwater samples from monitoring wells MW-01, MW-02, MW-03, MW-04 and remediation well RW19-1.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring well MW-2: Benzene.
- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, toluene, gasoline range organics (GRO), and diesel range organics (DRO).
- Monitoring well MW-4: Benzene.

The hydraulic gradient across the site was found to be approximately 0.024 feet per foot directed toward the northwest at 340 degrees. The calculated groundwater gradient and flow direction do not account for the water table drawdown associated with remediation well RW19-1. The groundwater gradient and flow direction are consistent with past monitoring events.

The operation of the groundwater recirculation well (RW 19-1) was checked and noted to be operating within normal range. The submersible pump runs on a continuous basis and observed to discharge approximately a total flow rate of 1.5 gallons per minute into the three on-site injection wells (RW-1, RW-2 and RW-3) that are located within the "footprint" of the former underground storage tank (UST).

May 2021. The 2nd quarter 2021 groundwater monitoring event included: measuring the depth to groundwater; measuring intrinsic water quality parameters; and collecting and analyzing groundwater samples from monitoring wells MW-01, MW-02, MW-03, MW-04 and remediation well RW19-1.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the primary samples were:

- Monitoring well MW-2: Benzene.
- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, toluene, GRO, DRO, naphthalene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.
- Monitoring well MW-4: Benzene.

The approximate hydraulic gradient and direction of groundwater flow across the site was found to be approximately 0.027 feet per foot directed toward the northeast at 59 degrees. The calculated groundwater gradient and flow direction do not account for the water table drawdown associated with remediation well RW19-1. The groundwater gradient and flow direction are generally consistent with past monitoring events. The gradient and direction of flow was graphically calculated by triangulation method.

The operation of the groundwater recirculation well (RW 19-1) was checked and noted to be operating within normal range. The submersible pump runs on a continuous basis and observed to discharge approximately a total flow rate of 1 to 2 gallons per minute into the three on-site injection wells (RW-1, RW-2 and RW-3) that are located within the "footprint" of the former underground storage tank (UST).

Chemox injection via the three remediation wells took place on May 19, 2021, during the completion of the groundwater monitoring event. Stantec completed an injection of two 55-pound bags of Klozur One® product mixed with 50 gallons of water was injected into each of the three remediation wells of the former bio-sparge system (RW-1, RW-2, and RW-3) for a total 330 pounds of Klozur One® and 750 gallons of water pumped from RW19-1 was injected into the in-situ groundwater treatment system. The next scheduled injection of chemox into the treatment wells is planned for the third quarter of 2021.

July 2021. The 2nd quarter 2021 groundwater monitoring event included: measuring the depth to groundwater; measuring intrinsic water quality parameters; and collecting and analyzing groundwater samples from monitoring wells MW-01, MW-02, MW-03, MW-04 and remediation well RW19-1.

Results of the groundwater analytical sampling showed that analytes detected above ADEC GCLs in the samples were:

- Monitoring well MW-3: Benzene, ethylbenzene, xylenes, gasoline range organics (GRO), diesel range organics (DRO), 1,2,4-trimethylbenzene (TMB) and 1,3,5-TMB.

- Monitoring well MW-4: Benzene.

However, the laboratory reported the test results for naphthalene in all of the wells were non-detect but all of them were above the ADEC GCL for naphthalene. Consequently, are shown in this report as exceedance of the naphthalene GCL.

The hydraulic gradient across the site was found to be approximately 0.027 feet per foot directed toward the northeast at 59 degrees. The calculation by triangulation of groundwater hydraulic flow was based on the static water levels in the four on-site monitoring wells and the pumping water level in "pump and treat" well (RW 19-1). The groundwater gradient and flow direction are generally consistent with past monitoring events.

The operation of the groundwater recirculation "pump and treat" well (RW 19-1) was checked and noted to be operating within normal range. The well's submersible pump runs on a continuous basis (24 hours each day). Upon arrival to the site on July 28, 2021, the well pump was discharging approximately 1.4 gallons per minute (gpm) into the three on-site treatment/remediation (injection) wells (RW-1, RW-2 and RW-3) that are located within the "footprint" of the former underground storage tank (UST). The pumped groundwater is treated in-situ with a chemical oxidation (chemox) injection process.

On July 28, 2021, Stantec completed groundwater remediation event that included the injection of chemical oxidation (chemox) solution into the three treatment/remediation wells. The injection process involved the manual injection of a mixture of two 55-pound bags of Klozur One® product and 50 gallons of tap water into each of the three remediation wells. Following the injection of the chemox solution, Stantec injected additional 250 to 300 gallons of tap water to "hydraulically push" the chemox mixture into each remediation well.

APPENDIX B

Field Methods & Procedures

APPENDIX B – FIELD METHODS AND PROCEDURES

Speedway Store 5314 (former Tesoro 2 Go Mart #76) located at 3600 Palmer-Wasilla Highway, Fairbanks, Alaska
Lot 7, Block 1, Cameron Acres Subdivision, Matanuska-Susitna Borough
ADEC File #2265.26.037

The following table presents the proposed tasks for the Alaska Department of Environmental Conservation (ADEC)-approved 2021 Corrective Action Work Plan. The scope of these tasks is based on the results and findings of the monitoring and remediation completed to date at the site.

2021 Work Plan Schedule for Speedway Store 5314 (Former T2GM 76)

Work Plan Task		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Task 1	Monitoring Wells: MW-1, MW-2, MW-3, and MW-4 including Remediation/Recirculation Well RW 19-1	V, G, D, S & I	V, G, D, S & I	V, G, D, S & I	V, G, D, P, S & I
	On-site Domestic Drinking Water Well				D & E
Task 2	O&M Recirculation Groundwater Treatment System	✓	✓	✓	✓
Task 3	Chemical Oxidation Treatment		✓	✓	✓

Key:
AK – Alaska Test Method
D – Diesel range organics by AK102.
EPA – U.S. Environmental Protection Agency
E – Drinking Water parameters by EPA Test Method 524.2.
G – Gasoline range organics by AK101.
I – Indicators, parameters tested include dissolved oxygen, specific conductance, oxygen-reduction potential, pH, and temperature.
O&M – Operation and Maintenance
V – Volatile organic compounds by EPA Test Method 8260C.
S – Sodium analyzed by Metals (ICP) Method 6010C.
P - Polynuclear aromatic hydrocarbons (PAHs), i.e., semi-volatile organic compounds, by EPA Test Method 8270D Selective Ion Monitoring (SIM).

The Corrective Action Work Plan for the year 2021 will be implemented by Stantec on behalf of Speedway. Groundwater monitoring will be conducted to track migration and trends of contaminants that are present at the site. All sampling activities will be completed in accordance with ADEC's *Underground Storage Tanks Procedures Manual– Standard Sampling Procedures* (March 22, 2017). The methods that will be used for conducting a monitoring event, unless otherwise noted in the monitoring report, will include:

- The static water levels in the monitoring wells will be measured with respect to the top of each well casing. The elevation of the static water level will be based on an arbitrary datum established on-site during a vertical control survey that will be completed by Stantec on an annual basis. The survey will be performed during the summer after the seasonal frost layer thaws.
- The monitoring wells will be purged of a minimum of three well bore volumes prior to collecting the water samples. A new, disposable, Teflon® bailer will be used to sample each well. The first bail of water removed from each well will be examined for petroleum odor, sheen, and any other unique physical features.
- Water and vapor samples will be collected in laboratory-supplied sample containers. The samples will be delivered to an ADEC-approved laboratory in accordance with standard chain-of-custody procedures.
- Additional water samples will be collected from the monitoring wells after the well has been purged, as described above, and tested in the field for chemical and physical intrinsic parameters listed in the 2021 Schedule shown above.

APPENDIX C

Field Measurements and Notes

Appendix C
Field Measurements and Notes

Project: Tesoro 2 Go Mart #76 **Date:** 7/14/2021
Project number: 185705377 **Samplers:** John Marshall, Luke Simms
Temperature: 55 *Wind:* *Light* *Humidity:* *Pressure:* *wx source:*

Well ID	Volume Purged (gallons)	Sheen/ Odor	Temp. (˚C)	pH	Dissolved Oxygen (mg/L)	ORP (mV)	Specific Conductance (µs/cm °c)	Top of Casing* (feet)	Depth to GW (feet btoc)	GW Elev.* (feet)	Total Depth (feet btoc)
MW-1	1.47	N/N	7.2	5.74	0.20	198	1,350	94.72	21.8	72.92	24.65
MW-2	3.0	N/N	5.0	6.25	0.27	174	735	95.08	21.1	73.98	27.10
MW-3	3.5	N/N	5.0	6.53	0.51	88	1135	94.53	18.59	75.94	25.80
MW-4	3.7	N/N	7.0	6.4	0.46	126.3	1,574	95.02	19.2	75.82	26.80
RW19-1	-	N/N	-	6.38	-	118	683	95.72	25.25	70.47	-

˚C - degree Celsius
µs/cm - microsiemens per centimeter
btoc - below top of casing
elev. - elevation
GW - groundwater
mg/L - milligrams per liter
NM - Not measured
ORP - oxidation reduction potential
Y - yes
N - no
TBD - to be determined

Instruments/methods used for above measurements		Model
Static water level	Heron	H01L
Conductivity	YSI	Pro Plus
Dissolved Oxygen	YSI	Pro Solo ODO
Temperature	YSI	Pro Solo ODO
ORP	YSI	Pro Plus
pH	YSI	Pro Plus

* Based on a vertical control survey of July 28, 2021.

Notes:

Well	Observations	Well Dia.	Time	8260C	AK101	AK102	8270DSIM	Sodium
MW-1		2"	1210	X	X	X	X	X
MW-2	several spring tails, high iron	2"	1340	X	X	X	X	X
MW-3	spring tails, odorous	2"	1500	X	X	X	X	X
MW-4	spring tails, iron present	2"	1416	X	X	X	X	X
RW19-1		4"	1540	X	X	X	X	X
Dup01	Duplicate of MW-4		1500	X	X	X	X	X

APPENDIX D

Tables of Historical Monitoring Data

Appendix D
Tables of Historical Monitoring Data

Monitoring Well MW-1

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	GW Elev (feet)
06-Nov-14	**0.027**	U (0.0005)	U (0.0005)	U (0.0015)	0.067	0.36	76.15
25-Feb-15	0.0013	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	76.16
10-Jun-15	U (0.002)	U (0.002)	U (0.003)	U (0.002)	U (0.060)	0.50	76.59
02-Sep-15	0.0011	U (0.001)	U (0.001)	U (0.003)	U (0.1)	U (0.40)	76.36
12-Nov-15	**0.029**	U (0.002)	U (0.003)	U (0.002)	0.14	U (0.21)	78.14
20-Jan-16	**0.071**	U (0.002)	U (0.003)	U (0.002)	0.18	0.22	77.57
09-May-16	**0.026**	U (0.001)	U (0.001)	U (0.003)	0.1	U (0.45)	77.70
13-Oct-16	**0.053**	U (0.001)	U (0.001)	U (0.003)	0.84	0.36	77.53
09-Dec-16	**0.027**	U (0.002)	U (0.002)	U (0.003)	0.067	0.67	76.74
08-Feb-17	**0.010**	U (0.002)	U (0.003)	U (0.002)	0.057	0.27	76.14
24-Apr-17	**0.0096**	U (0.002)	U (0.003)	U (0.003)	U (0.001)	U (0.0003)	77.39
01-Sep-17	**0.0068**	U (0.002)	U (0.003)	U (0.002)	U (1.0)	0.250	78.61
15-Feb-18	**0.012**	U (0.002)	U (0.003)	U (0.003)	U (1.0)	U (0.13)	77.07
29-Jun-18	**0.026**	U (0.002)	U (0.003)	U (0.003)	U (0.25) H	0.30	76.34
11-Sep-18	**0.01**	U (0.001)	U (0.001)	U (0.002)	U (0.15)	U (0.27)	76.80
26-Oct-18	**0.015**	U (0.002)	U (0.003)	U (0.003)	U (0.25)	0.31	76.94
25-Feb-19	**0.0037**	U (0.002)	U (0.003)	U (0.003)	U (0.25)	0.19	76.59
25-Apr-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.27)	77.94
25-Jul-19	**0.0071**	U (0.002)	U (0.003)	U (0.003)	U (0.25)	0.27	76.78
18-Oct-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	0.16	75.68
11-Aug-20	0.00262	U (0.001)	U (0.001)	U (0.003)	U (0.1)	U (0.808)	73.28
12-Oct-20	**0.00548**	U (0.001)	U (0.001)	U (0.002)	0.0110 J	0.369 J	72.86
23-Mar-21	.000526 J	U (0.001)	U (0.001)	U (0.001)	0.013 B,J	U (0.840)	73.39
19-May-21	**0.00481**	U (0.001)	U (0.001)	U (0.002)	0.0302 B,J	U (0.840)	73.18
14-Jul-21	0.00177	U (0.001)	U (0.001)	U (0.003)	U (0.1)	0.317 B,J	72.92
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**	NA

Appendix D
Tables of Historical Monitoring Data

Monitoring Well MW-2

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	GW Elev (feet)
06-Nov-14	**0.067**	0.026	**0.016**	0.130	0.68	0.19	77.95
25-Feb-15	**0.022**	0.0045	0.0034	0.020	0.130	U (0.41)	77.03
10-Jun-15	U (0.002)	U (0.002)	U (0.003)	**1.8**	**6.1**	1.1	76.67
02-Sep-15	**0.089**	0.056	**0.065**	**1.4**	**U (10)**	**1.8**	76.48
12-Nov-15	**0.091**	0.11	**0.13**	0.179	**22**	**1.8**	78.61
20-Jan-16	**0.520**	**1.5**	**0.83**	**5.1**	NL	**1.6**	78.28
09-May-16	**0.41**	0.37	**0.35**	**2.8**	U (10)	0.95	78.25
13-Oct-16	**0.42**	0.63	**0.48**	**2.62**	**9.2**	0.98	78.74
09-Dec-16	**0.57**	0.17	**0.50**	**1.01**	**11**	**1.7**	77.07
08-Feb-17	**0.053**	U (0.002)	**0.02**	0.096	0.58	0.20	77.32
24-Apr-17	**0.036**	0.012	**0.035**	**0.66**	**2.6**	0.94	78.01
01-Sep-17	**0.083**	0.026	**0.450**	**2.330**	**9.7**	1.3	79.31
15-Feb-18	**0.067**	0.02	**0.14**	**0.97**	**U (10)**	0.98	79.08
29-Jun-18	**0.17**	0.25	**0.59**	**3.3**	**6.0 H**	1.2	78.34
11-Sep-18	**0.094**	0.13	**0.18**	**1.08**	**4.8**	0.74	78.88
26-Oct-18	**0.17**	0.28	**0.48**	**3.01**	**11**	1.0	79.40
25-Feb-19	**0.092**	0.22	**0.18**	**1.41**	**5.4**	1.2	75.96
25-Apr-19	**0.051**	0.13	U (0.003)	**1.28**	**3.6**	0.93	79.50
25-Jul-19	**0.079**	0.13	**0.2**	**1.47**	**5.4**	0.89	77.72
18-Oct-19	**0.025**	0.0065	**0.022**	0.101	0.74	0.24	77.05
11-Aug-20	**0.0599**	0.0107	**0.0759**	**0.465**	0.921	0.553	74.50
12-Oct-20	**0.16**	U (0.001)	**0.0455**	0.168	0.755	0.409	74.55
23-Mar-21	**0.00542**	U (0.001)	U (0.001)	U (0.003)	0.0227 B,J	U (0.840)	73.54
19-May-21	0.00338	U (0.001)	0.000461 J	0.00501	0.0374 B,J	U (0.840)	73.58
14-Jul-21	0.00399	U (0.001)	0.00193	0.00465	0.0504 B,J	0.272 B,J	73.98
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**	NA

Appendix D
Tables of Historical Monitoring Data

Monitoring Well MW-3

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	GW Elev (feet)
06-Nov-14	**5.0**	**7.4**	**37**	**39**	**240**	**3.5**	78.38
25-Feb-15	**2.9**	**34**	**6.7**	**37**	**180**	**8.6**	77.98
10-Jun-15	**5.2**	**38**	**8.2**	**48**	**210**	**9.5**	78.40
02-Sep-15	**3.7**	**24**	**4.4**	**28**	**U (200)**	**5.1**	77.88
12-Nov-15	**1.3**	**2.1**	**0.21**	**1.69**	**87**	**3.6**	78.92
20-Jan-16	**3.8**	**13**	**4.2**	**25.3**	**120**	**4.1**	78.50
09-May-16	**2.1**	**21**	**2.2**	**33**	**69**	**1.5**	78.43
13-Oct-16	**1.2**	**4.2**	**2.9**	**14.6**	**46**	**2**	78.75
09-Dec-16	**0.17 (E)**	NL	NL	**0.54 (E)**	**100**	**3.3**	77.80
08-Feb-17	**39**	**99**	**53**	**103**	**98**	**3.9**	77.61
24-Apr-17	**2.5**	**14**	**5.2**	**28.9**	U (200)	**6.7**	78.61
01-Sep-17	**0.610**	**9.300**	**3.700**	**21.400**	**75**	**1.9**	79.33
15-Feb-18	**0.3**	**3.8**	**2.9**	**15.6**	**U (100)**	1.3	79.03
29-Jun-18	**0.28**	1.1	**1.7**	**8.2 H**	**23 H**	1.1	78.78
11-Sep-18	**0.29**	0.53	**1**	**5.6**	**14**	0.91	79.13
26-Oct-18	**0.32**	0.36	**0.89**	**4.3**	**15**	0.93	79.40
25-Feb-19	**0.95**	0.69	**2.3**	**11.4**	U (1.3)	**4.6**	78.15
25-Apr-19	**0.14**	0.13	**U (1.5)**	**U (1.5)**	**11**	0.64	79.58
25-Jul-19	**0.68**	**1.2**	**2.4**	**11.6**	**41**	**1.9**	78.38
18-Oct-19	**0.21**	0.66	**1.7**	**9.7**	**21**	1.2	77.04
11-Aug-20	**0.737**	1.05	**2.99**	**17**	**32.8**	**4.89**	75.60
12-Oct-20	**0.32**	0.868	**2.46**	**14.89**	**29.4**	**5.22**	76.18
23-Mar-21	**0.45**	**1.21**	**3.73**	**21.6**	**54.3**	U (0.840)	75.12
19-May-21	**0.473**	0.186 J	**2.04**	**11.1**	**31.1**	**5.08**	76.08
14-Jul-21	**0.581**	0.156 J	**2.65**	**12.87 C5**	**30.3**	**3.87 B**	75.94
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**	NA

Appendix D
Tables of Historical Monitoring Data

Monitoring Well MW-4

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	GW Elev (feet)
06-Nov-14	**0.940**	**1.9**	**0.3**	**1.5**	**13**	0.45	77.81
25-Feb-15	**3.7**	**6.6**	**0.56**	**2.7**	**29**	1.0	76.85
10-Jun-15	**1.1**	**2.3**	**0.54**	**2.7**	**14**	1.0	76.60
02-Sep-15	**0.026**	U (0.001)	0.007	0.03	0.3	U (0.40)	77.31
12-Nov-15	NL	NL	NL	NL	U (0.050)	U (0.21)	78.99
20-Jan-16	0.0043	U (0.002)	U (0.003)	U (0.002)	NL	0.15	78.56
09-May-16	**0.0092**	U (0.001)	U (0.001)	U (0.003)	U (0.1)	U (0.42)	78.51
13-Oct-16	U (0.00020)	U (0.001)	U (0.001)	U (0.003)	U (0.1)	0.18	78.84
09-Dec-16	NL	NL	NL	NL	U (0.05)	0.18	77.93
08-Feb-17	**0.017**	U (0.002)	U (0.003)	U (0.002)	U (0.05)	0.18	78.81
24-Apr-17	**0.012**	U (0.002)	0.0049	U (0.003)	U (0.001)	U (0.0003)	78.8
01-Sep-17	**0.550**	U (0.050)	**0.380**	**0.740**	**5.1**	0.48	79.38
15-Feb-18	**0.19**	U (0.10)	**0.26**	**0.438**	**3.3**	0.29	79.14
29-Jun-18	**0.09**	U (0.002)	**0.022**	0.027	0.52	0.19	79.00
11-Sep-18	**0.0086**	U (0.001)	0.0052	0.0062	U (0.15)	U (0.28)	79.23
26-Oct-18	**0.013**	U (0.002)	0.0045	0.0089	U (0.25)	0.15	79.46
25-Feb-19	**0.026**	U (0.002)	0.0034	0.0089	U (0.25)	0.20	78.30
25-Apr-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.27)	77.23
25-Jul-19	**0.051**	U (0.002)	U (0.003)	0.0078	U (0.25)	0.16	78.33
18-Oct-19	**0.020**	0.015	0.0059	0.0277	U (0.25)	U (0.12)	77.03
11-Aug-20	**0.054**	U (0.001)	0.000455	0.00933	0.084	U (0.800)	75.75
12-Oct-20	**0.129**	U (0.001)	0.00699	0.0264	0.313	U (0.800)	76.04
23-Mar-21	**0.079**	U (0.001)	**0.0178**	0.0345	0.274 B	0.266 J	73.84
19-May-21	**0.0307**	U (0.001)	0.00328	0.0123	0.153 B	U (0.840)	75.90
14-Jul-21	**0.0176**	U (0.001)	0.000375 J	0.00383 C5	0.0682 B,J	0.371 B,J	75.82
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**	NA

Monitoring Well RW19-1

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	GW Elev (feet)
11-Aug-20	0.001	U (0.001)	U (0.001)	0.000489	U (0.100)	U (0.848)	TBD
12-Oct-20	0.000609 J	U (0.001)	U (0.001)	U (0.002)	U (0.100)	U (0.800)	70.85
23-Mar-21	U (0.001)	U (0.001)	U (0.001)	U (0.003)	0.0119 B,J	U (0.840)	TBD
19-May-21	U (0.001)	U (0.001)	U (0.001)	U (0.002)	0.0158 B,J	U (0.800)	NC
14-Jul-21	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.100)	0.297 B,J	70.47
GCLs	**0.0046**	**1.1**	**0.015**	**0.19**	**2.2**	**1.5**	NA

TBD - to be determined
NA - Not applicable
B - The same analyte is found in the associated blank.
J - The identification of the analyte is acceptable; the reported value is an estimate.

APPENDIX E

Laboratory Analytical Report and ADEC Laboratory Data Review Checklist

ANALYTICAL REPORT

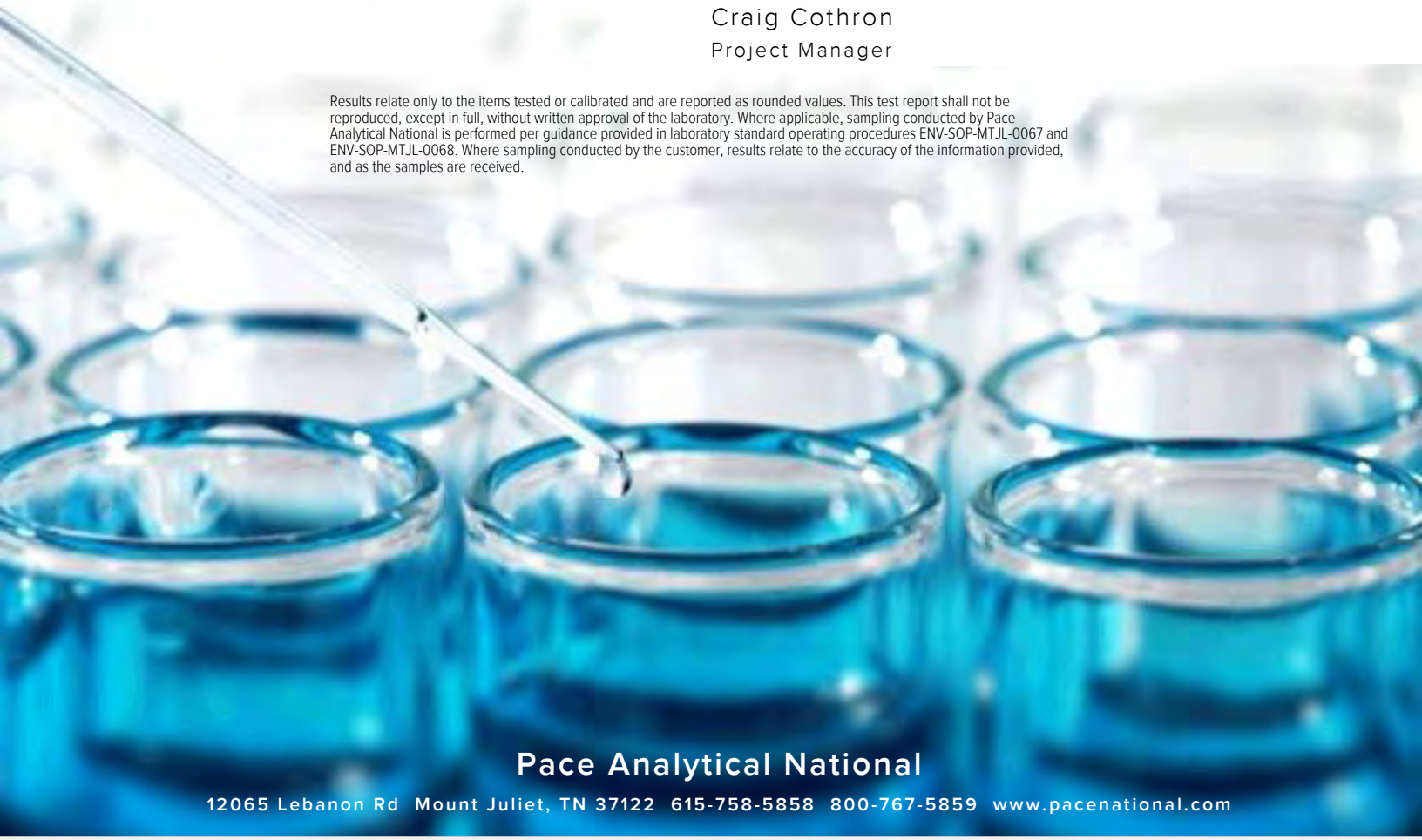
July 29, 2021

Stantec - Anchorage, AK - Speedway

Sample Delivery Group:	L1379488
Samples Received:	07/16/2021
Project Number:	185705377
Description:	Speedway 5314
Site:	0005314
Report To:	Mr. John Marshall 725 E Fireweed Lane Suite 200 Anchorage, AK 99503

Entire Report Reviewed By:

Craig Cothron
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

MW-01 L1379488-01 GW

Collected by: JM/LS | Collected date/time: 07/14/21 12:16 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 14:29	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	1	07/28/21 09:00	07/28/21 09:00	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1707337	1	07/18/21 16:21	07/18/21 16:21	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/28/21 16:10	CLG	Mt. Juliet, TN

MW-02 L1379488-02 GW

Collected by: JM/LS | Collected date/time: 07/14/21 13:40 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 14:32	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	1	07/28/21 09:21	07/28/21 09:21	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1707337	1	07/18/21 16:40	07/18/21 16:40	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/27/21 17:29	AEG	Mt. Juliet, TN

MW-03 L1379488-03 GW

Collected by: JM/LS | Collected date/time: 07/14/21 15:00 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 14:34	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	25	07/28/21 11:53	07/28/21 11:53	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1708050	200	07/20/21 01:54	07/20/21 01:54	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/27/21 17:52	AEG	Mt. Juliet, TN

MW-04 L1379488-04 GW

Collected by: JM/LS | Collected date/time: 07/14/21 14:16 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 14:37	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	1	07/28/21 09:43	07/28/21 09:43	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1708050	1	07/19/21 21:09	07/19/21 21:09	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/28/21 16:33	CLG	Mt. Juliet, TN

RW19-01 L1379488-05 GW

Collected by: JM/LS | Collected date/time: 07/14/21 15:40 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 13:27	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	1	07/28/21 10:05	07/28/21 10:05	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1708050	1	07/19/21 21:28	07/19/21 21:28	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/27/21 18:38	AEG	Mt. Juliet, TN

DUP1 L1379488-06 GW

Collected by: JM/LS | Collected date/time: 07/14/21 00:00 | Received date/time: 07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1710592	1	07/23/21 21:47	07/24/21 14:40	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1712707	50	07/28/21 13:19	07/28/21 13:19	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1712642	100	07/28/21 04:27	07/28/21 04:27	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1708838	1	07/23/21 07:52	07/27/21 19:01	AEG	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

TRIP BLANK L1379488-07 GW

Collected by	Collected date/time	Received date/time
JM/LS	07/14/21 12:00	07/16/21 14:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1708050	1	07/19/21 20:31	07/19/21 20:31	JHH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Project Manager

Metals (ICP) by Method 6010C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Sodium	32.2		0.504	3.00	1	07/24/2021 14:29	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	U		0.0287	0.100	1	07/28/2021 09:00	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*99.1*			*50.0-150*		*07/28/2021 09:00*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*108*			*79.0-125*		*07/28/2021 09:00*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.00177		0.0000941	0.00100	1	07/18/2021 16:21	WG1707337
n-Butylbenzene	U		0.000157	0.00100	1	07/18/2021 16:21	WG1707337
sec-Butylbenzene	U		0.000125	0.00100	1	07/18/2021 16:21	WG1707337
tert-Butylbenzene	U		0.000127	0.00100	1	07/18/2021 16:21	WG1707337
Ethylbenzene	U		0.000137	0.00100	1	07/18/2021 16:21	WG1707337
Isopropylbenzene	U		0.000105	0.00100	1	07/18/2021 16:21	WG1707337
Naphthalene	U	C3	0.00100	0.00500	1	07/18/2021 16:21	WG1707337
Toluene	U		0.000278	0.00100	1	07/18/2021 16:21	WG1707337
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	07/18/2021 16:21	WG1707337
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	07/18/2021 16:21	WG1707337
m&p-Xylene	U		0.000430	0.00200	1	07/18/2021 16:21	WG1707337
o-Xylene	U		0.000174	0.00100	1	07/18/2021 16:21	WG1707337
(S) Toluene-d8	*103*			*80.0-120*		*07/18/2021 16:21*	WG1707337
(S) 4-Bromofluorobenzene	*98.7*			*77.0-126*		*07/18/2021 16:21*	WG1707337
(S) 1,2-Dichloroethane-d4	*119*			*70.0-130*		*07/18/2021 16:21*	WG1707337

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	0.317	B J	0.229	0.800	1	07/28/2021 16:10	WG1708838
(S) o-Terphenyl	*54.2*			*50.0-150*		*07/28/2021 16:10*	WG1708838

Metals (ICP) by Method 6010C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Sodium	32.8		0.504	3.00	1	07/24/2021 14:32	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	0.0504	B J	0.0287	0.100	1	07/28/2021 09:21	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*98.6*			*50.0-150*		*07/28/2021 09:21*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*108*			*79.0-125*		*07/28/2021 09:21*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.00399		0.0000941	0.00100	1	07/18/2021 16:40	WG1707337
n-Butylbenzene	U		0.000157	0.00100	1	07/18/2021 16:40	WG1707337
sec-Butylbenzene	U		0.000125	0.00100	1	07/18/2021 16:40	WG1707337
tert-Butylbenzene	0.000702	J	0.000127	0.00100	1	07/18/2021 16:40	WG1707337
Ethylbenzene	0.00193		0.000137	0.00100	1	07/18/2021 16:40	WG1707337
Isopropylbenzene	0.000294	J	0.000105	0.00100	1	07/18/2021 16:40	WG1707337
Naphthalene	U	C3	0.00100	0.00500	1	07/18/2021 16:40	WG1707337
Toluene	U		0.000278	0.00100	1	07/18/2021 16:40	WG1707337
1,2,4-Trimethylbenzene	0.00487		0.000322	0.00100	1	07/18/2021 16:40	WG1707337
1,3,5-Trimethylbenzene	0.00107		0.000104	0.00100	1	07/18/2021 16:40	WG1707337
m&p-Xylene	0.00465		0.000430	0.00200	1	07/18/2021 16:40	WG1707337
o-Xylene	U		0.000174	0.00100	1	07/18/2021 16:40	WG1707337
(S) Toluene-d8	*103*			*80.0-120*		*07/18/2021 16:40*	WG1707337
(S) 4-Bromofluorobenzene	*100*			*77.0-126*		*07/18/2021 16:40*	WG1707337
(S) 1,2-Dichloroethane-d4	*119*			*70.0-130*		*07/18/2021 16:40*	WG1707337

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	0.272	B J	0.229	0.800	1	07/27/2021 17:29	WG1708838
(S) o-Terphenyl	*64.8*			*50.0-150*		*07/27/2021 17:29*	WG1708838

Metals (ICP) by Method 6010C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Sodium	49.8		0.504	3.00	1	07/24/2021 14:34	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	30.3		0.718	2.50	25	07/28/2021 11:53	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*96.4*			*50.0-150*		*07/28/2021 11:53*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*109*			*79.0-125*		*07/28/2021 11:53*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.541		0.0188	0.200	200	07/20/2021 01:54	WG1708050
n-Butylbenzene	U		0.0314	0.200	200	07/20/2021 01:54	WG1708050
sec-Butylbenzene	U		0.0250	0.200	200	07/20/2021 01:54	WG1708050
tert-Butylbenzene	U		0.0254	0.200	200	07/20/2021 01:54	WG1708050
Ethylbenzene	2.47		0.0274	0.200	200	07/20/2021 01:54	WG1708050
Isopropylbenzene	0.109	J	0.0210	0.200	200	07/20/2021 01:54	WG1708050
Naphthalene	U		0.200	1.00	200	07/20/2021 01:54	WG1708050
Toluene	0.156	J	0.0556	0.200	200	07/20/2021 01:54	WG1708050
1,2,4-Trimethylbenzene	2.16		0.0644	0.200	200	07/20/2021 01:54	WG1708050
1,3,5-Trimethylbenzene	0.594		0.0208	0.200	200	07/20/2021 01:54	WG1708050
m&p-Xylene	9.98	C5	0.0860	0.400	200	07/20/2021 01:54	WG1708050
o-Xylene	2.99		0.0348	0.200	200	07/20/2021 01:54	WG1708050
(S) Toluene-d8	*106*			*80.0-120*		*07/20/2021 01:54*	WG1708050
(S) 4-Bromofluorobenzene	*98.1*			*77.0-126*		*07/20/2021 01:54*	WG1708050
(S) 1,2-Dichloroethane-d4	*80.5*			*70.0-130*		*07/20/2021 01:54*	WG1708050

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	3.59	B	0.229	0.800	1	07/27/2021 17:52	WG1708838
(S) o-Terphenyl	*64.7*			*50.0-150*		*07/27/2021 17:52*	WG1708838

Metals (ICP) by Method 6010C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Sodium	76.7		0.504	3.00	1	07/24/2021 14:37	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	0.0682	B J	0.0287	0.100	1	07/28/2021 09:43	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*98.2*			*50.0-150*		*07/28/2021 09:43*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*109*			*79.0-125*		*07/28/2021 09:43*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.0176		0.0000941	0.00100	1	07/19/2021 21:09	WG1708050
n-Butylbenzene	U		0.000157	0.00100	1	07/19/2021 21:09	WG1708050
sec-Butylbenzene	U		0.000125	0.00100	1	07/19/2021 21:09	WG1708050
tert-Butylbenzene	U		0.000127	0.00100	1	07/19/2021 21:09	WG1708050
Ethylbenzene	0.000375	J	0.000137	0.00100	1	07/19/2021 21:09	WG1708050
Isopropylbenzene	0.000405	J	0.000105	0.00100	1	07/19/2021 21:09	WG1708050
Naphthalene	U		0.00100	0.00500	1	07/19/2021 21:09	WG1708050
Toluene	U		0.000278	0.00100	1	07/19/2021 21:09	WG1708050
1,2,4-Trimethylbenzene	0.00374		0.000322	0.00100	1	07/19/2021 21:09	WG1708050
1,3,5-Trimethylbenzene	0.000529	J	0.000104	0.00100	1	07/19/2021 21:09	WG1708050
m&p-Xylene	0.00383	C5	0.000430	0.00200	1	07/19/2021 21:09	WG1708050
o-Xylene	U		0.000174	0.00100	1	07/19/2021 21:09	WG1708050
(S) Toluene-d8	*108*			*80.0-120*		*07/19/2021 21:09*	WG1708050
(S) 4-Bromofluorobenzene	*99.7*			*77.0-126*		*07/19/2021 21:09*	WG1708050
(S) 1,2-Dichloroethane-d4	*81.1*			*70.0-130*		*07/19/2021 21:09*	WG1708050

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	0.371	B J	0.229	0.800	1	07/28/2021 16:33	WG1708838
(S) o-Terphenyl	*55.9*			*50.0-150*		*07/28/2021 16:33*	WG1708838

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	28.8		0.504	3.00	1	07/24/2021 13:27	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
TPHGAK C6 to C10	U		0.0287	0.100	1	07/28/2021 10:05	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*98.9*			*50.0-150*		*07/28/2021 10:05*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*108*			*79.0-125*		*07/28/2021 10:05*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	07/19/2021 21:28	WG1708050
n-Butylbenzene	U		0.000157	0.00100	1	07/19/2021 21:28	WG1708050
sec-Butylbenzene	U		0.000125	0.00100	1	07/19/2021 21:28	WG1708050
tert-Butylbenzene	U		0.000127	0.00100	1	07/19/2021 21:28	WG1708050
Ethylbenzene	U		0.000137	0.00100	1	07/19/2021 21:28	WG1708050
Isopropylbenzene	U		0.000105	0.00100	1	07/19/2021 21:28	WG1708050
Naphthalene	U		0.00100	0.00500	1	07/19/2021 21:28	WG1708050
Toluene	U		0.000278	0.00100	1	07/19/2021 21:28	WG1708050
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	07/19/2021 21:28	WG1708050
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	07/19/2021 21:28	WG1708050
m&p-Xylene	U		0.000430	0.00200	1	07/19/2021 21:28	WG1708050
o-Xylene	U		0.000174	0.00100	1	07/19/2021 21:28	WG1708050
(S) Toluene-d8	*109*			*80.0-120*		*07/19/2021 21:28*	WG1708050
(S) 4-Bromofluorobenzene	*95.3*			*77.0-126*		*07/19/2021 21:28*	WG1708050
(S) 1,2-Dichloroethane-d4	*81.2*			*70.0-130*		*07/19/2021 21:28*	WG1708050

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
AK102 DRO C10-C25	0.297	B J	0.229	0.800	1	07/27/2021 18:38	WG1708838
(S) o-Terphenyl	*74.2*			*50.0-150*		*07/27/2021 18:38*	WG1708838

Metals (ICP) by Method 6010C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Sodium	50.1		0.504	3.00	1	07/24/2021 14:40	WG1710592

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	24.1	B	1.44	5.00	50	07/28/2021 13:19	WG1712707
(S) a,a,a-Trifluorotoluene(FID)	*65.6*			*50.0-150*		*07/28/2021 13:19*	WG1712707
(S) a,a,a-Trifluorotoluene(PID)	*108*			*79.0-125*		*07/28/2021 13:19*	WG1712707

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.581		0.00941	0.100	100	07/28/2021 04:27	WG1712642
n-Butylbenzene	U		0.0157	0.100	100	07/28/2021 04:27	WG1712642
sec-Butylbenzene	U		0.0125	0.100	100	07/28/2021 04:27	WG1712642
tert-Butylbenzene	U		0.0127	0.100	100	07/28/2021 04:27	WG1712642
Ethylbenzene	2.65		0.0137	0.100	100	07/28/2021 04:27	WG1712642
Isopropylbenzene	0.110		0.0105	0.100	100	07/28/2021 04:27	WG1712642
Naphthalene	U		0.100	0.500	100	07/28/2021 04:27	WG1712642
Toluene	0.144		0.0278	0.100	100	07/28/2021 04:27	WG1712642
1,2,4-Trimethylbenzene	2.48		0.0322	0.100	100	07/28/2021 04:27	WG1712642
1,3,5-Trimethylbenzene	0.683		0.0104	0.100	100	07/28/2021 04:27	WG1712642
m&p-Xylene	9.57		0.0430	0.200	100	07/28/2021 04:27	WG1712642
o-Xylene	2.98		0.0174	0.100	100	07/28/2021 04:27	WG1712642
(S) Toluene-d8	*100*			*80.0-120*		*07/28/2021 04:27*	WG1712642
(S) 4-Bromofluorobenzene	*94.4*			*77.0-126*		*07/28/2021 04:27*	WG1712642
(S) 1,2-Dichloroethane-d4	*97.1*			*70.0-130*		*07/28/2021 04:27*	WG1712642

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	3.87	B	0.229	0.800	1	07/27/2021 19:01	WG1708838
(S) o-Terphenyl	*63.7*			*50.0-150*		*07/27/2021 19:01*	WG1708838

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	07/19/2021 20:31	WG1708050
n-Butylbenzene	U		0.000157	0.00100	1	07/19/2021 20:31	WG1708050
sec-Butylbenzene	U		0.000125	0.00100	1	07/19/2021 20:31	WG1708050
tert-Butylbenzene	U		0.000127	0.00100	1	07/19/2021 20:31	WG1708050
Ethylbenzene	U		0.000137	0.00100	1	07/19/2021 20:31	WG1708050
Isopropylbenzene	U		0.000105	0.00100	1	07/19/2021 20:31	WG1708050
Naphthalene	U		0.00100	0.00500	1	07/19/2021 20:31	WG1708050
Toluene	U		0.000278	0.00100	1	07/19/2021 20:31	WG1708050
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	07/19/2021 20:31	WG1708050
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	07/19/2021 20:31	WG1708050
m&p-Xylene	U		0.000430	0.00200	1	07/19/2021 20:31	WG1708050
o-Xylene	U		0.000174	0.00100	1	07/19/2021 20:31	WG1708050
(S) Toluene-d8	*108*			*80.0-120*		*07/19/2021 20:31*	WG1708050
(S) 4-Bromofluorobenzene	*99.7*			*77.0-126*		*07/19/2021 20:31*	WG1708050
(S) 1,2-Dichloroethane-d4	*81.9*			*70.0-130*		*07/19/2021 20:31*	WG1708050

Method Blank (MB)

(MB) R3683622-1 07/24/21 13:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sodium	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3683622-2 07/24/21 13:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sodium	10.0	9.34	93.4	80.0-120	

L1379488-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1379488-05 07/24/21 13:27 • (MS) R3683622-4 07/24/21 13:32 • (MSD) R3683622-5 07/24/21 13:34

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sodium	10.0	28.8	37.2	37.3	84.4	85.5	1	75.0-125			0.292	20

Method Blank (MB)

(MB) R3685031-2 07/28/21 03:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPHGAK C6 to C10	0.0485	J	0.0287	0.100
(S) a,a,a-Trifluorotoluene(PID)	*107*			*79.0-125*
(S) a,a,a-Trifluorotoluene(FID)	*95.7*			*60.0-120*

Laboratory Control Sample (LCS)

(LCS) R3685031-1 07/28/21 02:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPHGAK C6 to C10	5.00	4.54	90.8	60.0-120	
(S) a,a,a-Trifluorotoluene(PID)			*121*	*79.0-125*	
(S) a,a,a-Trifluorotoluene(FID)			*102*	*60.0-120*	

L1379471-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1379471-04 07/28/21 05:54 • (MS) R3685031-4 07/28/21 14:02 • (MSD) R3685031-6 07/28/21 14:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPHGAK C6 to C10	5.00	0.292	3.01	1.63	54.4	26.8	1	70.0-130	J6	J3 J6	59.5	20
(S) a,a,a-Trifluorotoluene(PID)					*118*	*112*		*79.0-125*				
(S) a,a,a-Trifluorotoluene(FID)					*99.9*	*97.3*		*50.0-150*				

L1379471-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1379471-03 07/28/21 05:32 • (MS) R3685031-3 07/28/21 13:40

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
TPHGAK C6 to C10	5.00	3.32	6.80	69.6	1	70.0-130	J6
(S) a,a,a-Trifluorotoluene(PID)				*131*		*79.0-125*	J1
(S) a,a,a-Trifluorotoluene(FID)				*105*		*50.0-150*	

Method Blank (MB)

(MB) R3681646-2 07/18/21 12:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
n-Butylbenzene	U		0.000157	0.00100
sec-Butylbenzene	U		0.000125	0.00100
tert-Butylbenzene	U		0.000127	0.00100
Ethylbenzene	U		0.000137	0.00100
Isopropylbenzene	U		0.000105	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000278	0.00100
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
o-Xylene	U		0.000174	0.00100
m&p-Xylenes	U		0.000430	0.00200
(S) Toluene-d8	*102*			*80.0-120*
(S) 4-Bromofluorobenzene	*95.1*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*115*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3681646-1 07/18/21 11:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00504	101	70.0-123	
n-Butylbenzene	0.00500	0.00430	86.0	73.0-125	
sec-Butylbenzene	0.00500	0.00521	104	75.0-125	
tert-Butylbenzene	0.00500	0.00555	111	76.0-124	
Ethylbenzene	0.00500	0.00511	102	79.0-123	
Isopropylbenzene	0.00500	0.00498	99.6	76.0-127	
Naphthalene	0.00500	0.00337	67.4	54.0-135	
Toluene	0.00500	0.00530	106	79.0-120	
1,2,4-Trimethylbenzene	0.00500	0.00506	101	76.0-121	
1,3,5-Trimethylbenzene	0.00500	0.00544	109	76.0-122	
o-Xylene	0.00500	0.00506	101	80.0-122	
m&p-Xylenes	0.0100	0.0105	105	80.0-122	
(S) Toluene-d8			*108*	*80.0-120*	
(S) 4-Bromofluorobenzene			*93.3*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*112*	*70.0-130*	

Method Blank (MB)

(MB) R3684467-2 07/19/21 20:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
n-Butylbenzene	U		0.000157	0.00100
sec-Butylbenzene	U		0.000125	0.00100
tert-Butylbenzene	U		0.000127	0.00100
Ethylbenzene	U		0.000137	0.00100
Isopropylbenzene	U		0.000105	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000278	0.00100
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
o-Xylene	U		0.000174	0.00100
m&p-Xylenes	U		0.000430	0.00200
(S) Toluene-d8	*105*			*80.0-120*
(S) 4-Bromofluorobenzene	*101*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*82.7*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3684467-1 07/19/21 19:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00526	105	70.0-123	
n-Butylbenzene	0.00500	0.00448	89.6	73.0-125	
sec-Butylbenzene	0.00500	0.00495	99.0	75.0-125	
tert-Butylbenzene	0.00500	0.00516	103	76.0-124	
Ethylbenzene	0.00500	0.00540	108	79.0-123	
Isopropylbenzene	0.00500	0.00494	98.8	76.0-127	
Naphthalene	0.00500	0.00520	104	54.0-135	
Toluene	0.00500	0.00551	110	79.0-120	
1,2,4-Trimethylbenzene	0.00500	0.00475	95.0	76.0-121	
1,3,5-Trimethylbenzene	0.00500	0.00502	100	76.0-122	
o-Xylene	0.00500	0.00512	102	80.0-122	
m&p-Xylenes	0.0100	0.0112	112	80.0-122	
(S) Toluene-d8			*108*	*80.0-120*	
(S) 4-Bromofluorobenzene			*95.0*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*80.4*	*70.0-130*	

L1379853-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1379853-02 07/19/21 22:06 • (MS) R3684467-3 07/20/21 02:51 • (MSD) R3684467-4 07/20/21 03:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.000288	0.00508	0.00583	95.8	111	1	17.0-158			13.7	27
n-Butylbenzene	0.00500	0.000159	0.00414	0.00506	79.6	98.0	1	31.0-150			20.0	30
sec-Butylbenzene	0.00500	0.000134	0.00484	0.00572	94.1	112	1	33.0-155			16.7	29
tert-Butylbenzene	0.00500	U	0.00487	0.00586	97.4	117	1	34.0-153			18.5	28
Ethylbenzene	0.00500	0.00382	0.00550	0.00622	33.6	48.0	1	30.0-155			12.3	27
Isopropylbenzene	0.00500	0.000528	0.00485	0.00582	86.4	106	1	28.0-157			18.2	27
Naphthalene	0.00500	0.00204	0.00584	0.00551	76.0	69.4	1	12.0-156			5.81	35
Toluene	0.00500	0.000311	0.00601	0.00649	114	124	1	26.0-154			7.68	28
1,2,4-Trimethylbenzene	0.00500	0.0192	0.00541	0.00541	0.000	0.000	1	26.0-154	J6	J6	0.000	27
1,3,5-Trimethylbenzene	0.00500	0.00610	0.00498	0.00551	0.000	0.000	1	28.0-153	J6	J6	10.1	27
o-Xylene	0.00500	0.00485	0.00549	0.00593	12.8	21.6	1	45.0-144	J6	J6	7.71	26
m&p-Xylenes	0.0100	0.0169	0.0116	0.0132	0.000	0.000	1	43.0-146	J6	J6	12.9	26
(S) Toluene-d8					*107*	*109*		*80.0-120*				
(S) 4-Bromofluorobenzene					*97.1*	*97.2*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*81.1*	*80.9*		*70.0-130*				

Method Blank (MB)

(MB) R3685055-3 07/28/21 01:05

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
n-Butylbenzene	U		0.000157	0.00100
sec-Butylbenzene	U		0.000125	0.00100
tert-Butylbenzene	U		0.000127	0.00100
Ethylbenzene	U		0.000137	0.00100
Isopropylbenzene	U		0.000105	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000278	0.00100
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
o-Xylene	U		0.000174	0.00100
m&p-Xylenes	U		0.000430	0.00200
(S) Toluene-d8	*97.5*			*80.0-120*
(S) 4-Bromofluorobenzene	*92.1*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*98.0*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3685055-1 07/27/21 23:45 • (LCSD) R3685055-2 07/28/21 00:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00541	0.00537	108	107	70.0-123			0.742	20
n-Butylbenzene	0.00500	0.00511	0.00512	102	102	73.0-125			0.196	20
sec-Butylbenzene	0.00500	0.00531	0.00529	106	106	75.0-125			0.377	20
tert-Butylbenzene	0.00500	0.00520	0.00516	104	103	76.0-124			0.772	20
Ethylbenzene	0.00500	0.00547	0.00535	109	107	79.0-123			2.22	20
Isopropylbenzene	0.00500	0.00524	0.00505	105	101	76.0-127			3.69	20
Naphthalene	0.00500	0.00519	0.00599	104	120	54.0-135			14.3	20
Toluene	0.00500	0.00569	0.00543	114	109	79.0-120			4.68	20
1,2,4-Trimethylbenzene	0.00500	0.00546	0.00529	109	106	76.0-121			3.16	20
1,3,5-Trimethylbenzene	0.00500	0.00541	0.00532	108	106	76.0-122			1.68	20
o-Xylene	0.00500	0.00531	0.00517	106	103	80.0-122			2.67	20
m&p-Xylenes	0.0100	0.0106	0.0104	106	104	80.0-122			1.90	20
(S) Toluene-d8				*99.9*	*95.7*	*80.0-120*				
(S) 4-Bromofluorobenzene				*95.9*	*91.9*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*100*	*101*	*70.0-130*				

Method Blank (MB)

(MB) R3684640-1 07/27/21 12:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
AK102 DRO C10-C25	0.240	J	0.229	0.800
(S) o-Terphenyl	*79.2*			*60.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3684640-2 07/27/21 12:29 • (LCSD) R3684640-3 07/27/21 12:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6.00	6.31	5.93	105	98.8	75.0-125			6.21	20
(S) o-Terphenyl				*67.8*	*60.0*	*60.0-120*				

L1378920-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1378920-01 07/27/21 19:24 • (MS) R3684640-4 07/27/21 19:47 • (MSD) R3684640-5 07/27/21 20:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6.00	0.397	4.89	5.77	74.9	89.6	1	75.0-125	J6		16.5	20
(S) o-Terphenyl					*49.6*	*49.3*		*50.0-150*	J2	J2		

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
C5	The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Stantec - Anchorage, AK - Speedway

725 E Fireweed Lane
Suite 200
Anchorage, AK 99503

Billing Information:
Accounts Payable
PO Box 1510
Springfield, OH 45501

Pres Chk

Report to:
Mr. John Marshall

Email To: craig.cothron@pacelabs.com

Project Description:
Speedway 5314

City/State Collected: Wasilla, AK

Please Circle: PT MT CT ET

Phone: 907-266-1108

Client Project #
185705377

Lab Project #
STAAAKSSA-5314

Collected by (print):
JM/LS

Site/Facility ID #
0005314

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed
Standard

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	AK101 40mlAmb HCl	AK102 100ml Amb HCl	NAICP 250mlHDPE-HNO3	V8260C 40mlAmb-HCl	V8260C 40mlAmb-HCl-Blk						Remarks	Sample # (lab only)
MW-01	G	GW	—	7/14/21	1216	9	X	X	X	X								-01
MW-02	G	GW	—	7/14/21	1340	9	X	X	X	X								-02
MW-03	G	GW	—	7/14/21	1500	9	X	X	X	X								-03
MW-04	G	GW	—	7/14/21	1416	9	X	X	X	X								-04
RW19-01	G	GW	—	7/14/21	1540	9	X	X	X	X								-05
DUP1	G	GW	—	7/14/21	1502	9	X	X	X	X								-06
TRIP BLANK	G	GW	—	7/14/21	1200	1					X							-07

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1375488
F241
Table #

Acctnum: STAAAKSSA
Template: T187778
Prelogin: P860006
PM: 034 - Craig Cothron
PB: BF 7/9/21
Shipped Via: FedEX 2nd Day

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 5217 3309 7392

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	7/15/21	0947		AG1	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
				4.1, 3.7=4.3 54	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK
				7/16/21 12:00	

Laboratory Data Review Checklist

Completed By:

Jeremiah Malenfant

Title:

Intern

Date:

August 2, 2021

Consultant Firm:

Stantec Consulting Services, Inc

Laboratory Name:

Pace Analytical

Laboratory Report Number:

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

ADEC File Number:

2265.56.037

Hazard Identification Number:

2986

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

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

   Yes☒ No☐ N/A☐ 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:

   Samples not transferred

2. Chain of Custody (CoC)

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

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   4.3° C

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

   Yes☒ No☐ N/A☐ Comments:

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

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

Yes☒ No☐ N/A☐ Comments:

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 documented.

e. Data quality or usability affected?

Comments:

No.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

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

Yes☐ No☒ N/A☐ Comments:

Case Narrative is a form paragraph signed off on. Any discrepancies are noted in the lab report proper.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Case narrative includes reference to dilution and data correction for the dilution.

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

Comments:

None.

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

No soils.

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

Yes☐ No☒ N/A☐ Comments:

Naphthalene analyzed by EPA 8260C could not be detected below the GCL. Method 8260DSIM was not used in this event.

e. Data quality or usability affected?

Naphthalene data is completely unusable.

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

DRO and GRO had detections under the RDL but above the MDL in the associated Method Blanks

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

DRO in all samples, GRO in MW2, MW4, and DUP1

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

Yes☒ No☐ N/A☐ Comments:

v. Data quality or usability affected?

Comments:

No; GRO and DRO detections in the samples with exceedances are well above the GCLs, and those without exceedances are well below GCLs.

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☐ N/A☐ Comments:

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

Yes☒ No☐ N/A☒ Comments:

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

Yes☒ No☐ N/A☐ Comments:

L1379488

Laboratory Report Date:

7/29/2021

CS Site Name:

Speedway 5314 (Former Tesoro 2Go Mart 76)

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

Yes☒ No☐ N/A☐ Comments:

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

Comments:

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

Yes☐ No☐ N/A☒ Comments:

No samples affected.

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

Comments:

No.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

Matrix interference with the detection of GRO led to a %R well below the lower recovery limit.

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iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

Matrix interference with the detection of GRO led to an RPD well above the RPD limit.

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

Comments:

Unclear in report.

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:

RPD verified by field duplicate showed that GRO precision was within the 30% tolerance, but had a higher deviation than the other samples. However, no samples returned a value sufficiently close to the GCL that laboratory precision errors could have made the difference between an exceedance and a non-exceedance.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

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

Yes☐ No☐ N/A☒ Comments:

No IDA methods used

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

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

Yes☐ No☐ N/A☒ Comments:

iv. Data quality or usability affected?

Comments:

No.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ 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:

Only one cooler used to transport samples.

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

Except in case of Naphthalene, explained above.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

Naphthalene data not useable.

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f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

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

RPD (%) = 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:

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

Comments:

No.

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

Yes☐ No☒ N/A☐ Comments:

All disposable equipment.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

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ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

No.

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

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

APPENDIX F

Well RW-19-1 Redevelopment and Pump Testing July and August 2021

Appendix F
Well RW 19-1 Redevelopment and Pump Testing July & August 2021

Time Series RW19 and MW4 SWLs				
Time	Well	SWL	Pump gpm	Notes:
0:00	RW19	24.30	1.43	Time shown as hours:minutes after 11:00 on July 28, 2021
0:40	MW4	20.02	1.43	
2:30	RW19	23.01	0.00	Pump pulled
4:45	RW19	23.09	0.00	lowered
5:30	RW19	24.03	5.00	(estimated gpm)
6:00	RW19	24.35	5.00	(estimated gpm) left site with the pump off
24:30	MW4	20.73	0.00	Next day, July 29 2021
24:30	RW19	23.10	0.00	
25:18	RW19	24.25	4.50	Turned pump on
25:33	RW19	24.39	4.50	
25:48	RW19	24.42	4.50	
26:03	RW19	24.42	4.50	
26:18	RW19	24.44	4.50	
26:18	MW4	20.93	4.50	
26:25	RW19	25.02	6.70	Increased pump speed
26:40	RW19	25.14	6.70	
26:55	RW19	25.20	6.70	
26:55	MW4	21.21	6.70	
33:20	RW19	25.46	6.70	
33:20	MW4	20.29	6.70	Left site with pump running
47:08	RW19	25.53	6.70	Next day, July 30 2021
47:08	MW4	20.60	6.70	
73:30	RW19	25.62	6.70	Next day, July 31 2021
73:30	MW4	18.85	6.70	
100:00	RW19	25.68	6.70	Next day, August 1 2021
100:00	MW4	18.33	6.70	
119:00	RW19	25.72	6.70	Next day, August 2 2021
119:00	MW4	18.23	6.70	
120:10	RW19	24.42	5.00	Diverted flow to injection well 2 instead of 3, reduced flow to an even 5 gpm
120:10	MW4	18.21	5.00	
127:10	RW19	24.20	5.00	
127:10	MW4	18.38	5.00	
141:45	RW19	24.23	5.00	Next day, August 3 2021
141:45	MW4	18.70	5.00	

Appendix F
Well RW 19-1 Redevelopment and Pump Testing July & August 2021

July 28 SWLs Pump ON:	
Well	SWL (ft btoc)
MW1	21.58
MW2	21.74
MW3	18.99
MW4	20.02
RW19	23.01

July 29 SWLs Pump OFF:	
Well	SWL (ft btoc)
MW1	21.98
MW2	22.00
MW3	19.02
MW4	20.73
RW19	23.10

Aug 2 SWLs Pump ON:	
Well	SWL (ft btoc)
MW1	22.91
MW2	22.03
MW3	17.57
MW4	18.23
RW19	25.72