

Speedway Store 5310
(Former Tesoro 2 Go Mart #112)
ADEC File #100.26.159

4Q-October 2021 GWM Event Report

Prepared For



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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
EIT	Engineer in Training
EPA	U.S. Environmental Protection Agency
GCL	groundwater cleanup level
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
SC	specific conductance
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 4th quarter (semi-annual) Groundwater Monitoring and Remediation Event Report was prepared by Stantec Consulting Services, Inc. (Stantec) on behalf of Speedway LLC for Store #5310 (formerly known as Tesoro 2 Go Mart #112), located at 3392 Badger Road, North Pole, Alaska (**Figure 1**). The methods that were 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 (see **Appendix B**).

The groundwater monitoring event on October 13, 2021, was conducted by Stantec personnel Engineer-In-Training (EIT) Leslie Petre and EIT Geoff Moorhead. The sampling task included measuring the depth to groundwater, measuring water quality parameters, and collecting and analyzing groundwater samples from Monitoring Wells MW-01, MW-02, MW-03, MW-04, MW-06, MW-10, MW17-2, and MW17-5 (**Figure 2**).

A Surfer[®] software program was used to calculate the average groundwater hydraulic flow across the site. The groundwater gradient was calculated to be approximately 0.0055 feet per foot with flow trending toward the northeast at 50 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site, as shown in the groundwater flow summary presented on **Figure 2**.

Results of the analytical sampling showed analytes were present at concentrations exceeding ADEC groundwater cleanup levels (GCLs) as listed in Alaska Administrative Code (AAC) 18AAC 75.345 Table C (updated September 18, 2019) for all wells tested. Monitoring wells and the respective analytes in exceedance of ADEC GCLs included:

- MW-02: Naphthalene
- MW-03: Benzene, ethylbenzene, total xylenes, GRO, DRO, 1,2,4-trimethylbenzene (1,2,4-TMB), 1,3,5-trimethylbenzene (1,3,5-TMB), and naphthalene.
- MW-04: DRO
- MW-17-2: Ethylbenzene, total xylenes, DRO, 1,2,4-TMB, 1,3,5-TMB, and naphthalene.
- MW-17-5: Benzene, ethylbenzene, total xylenes, 1,2,4-TMB, 1,3,5-TMB and naphthalene.

The remediation event on October 15, 2021, consisted of a chemical oxidation (chemox) injection of Klozur[®] One product combined with potable water from the store into the following four remediation wells: RW-17-1, RW-17-3, RW-17-4 and RW-17-6 (see **Figure 2**). The solution was hydraulically “pushed” into the subsurface formation with the injection of additional potable water into each well. In summary, a total of 385 pounds of Klozur[®] One product mixed with 1,070 gallons of water was injected into the subsurface via the remediation wells during the chemox injection process.

2.0 SITE BACKGROUND

Background information is summarized in **Appendix A**.

3.0 FIELD ACTIVITIES

The following field activities were conducted during this monitoring event:

- Measuring depth to groundwater in Monitoring Wells MW-01, MW-02, MW-03, MW-04, MW-06, MW-10, MW-17-2, and MW-17-5.
- Collected field measurements of the following intrinsic water quality parameters: temperature, pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), and specific conductance (SC).
- Collected groundwater samples from Monitoring Wells MW-01, MW-02, MW-03, MW-04, MW-06, MW-10, MW-17-2, and MW-17-5, and submitted them for laboratory analysis for the following tests: U.S. Environmental Protection Agency (EPA) Method 8260C for Volatile Organic Compounds (VOC) including benzene, toluene, ethylbenzene, and xylenes (BTEX); 8270D-SIM for polycyclic aromatic hydrocarbon (PAH); Alaska Test Method AK101 for GRO; AK102 for DRO; and EPA Test Method 200.8 metals for sodium.
- Subsequent to the sampling event on October 15, completed chemox injection with Klozur One® solution into remediation wells RW-17-1, RW-17-3, RW-17-4 and RW-17-6.

Field methods and procedures are provided in **Appendix B** and field measurements, notes, and a hydraulic gradient plot are provided in **Appendix C**.

4.0 GROUNDWATER MONITORING RESULTS

Groundwater Levels. **Table 1** presents groundwater elevations in the monitoring wells that were based on the depths to static groundwater levels measured during this monitoring event. Based on a polynomial regression with the Surfer® software program, the average groundwater hydraulic gradient across the site was calculated to be approximately 0.0055 feet per foot with flow tending toward the northeast at 50 degrees. A plot of the groundwater elevation contours is provided in **Appendix C**. The flow direction and gradient for this monitoring event were consistent with the historical data for this site, as shown in the groundwater flow “rose diagram” for the past 10 monitoring events that are presented on **Figure 2**.

Table 1 Groundwater Elevations
Measurements taken on October 13, 2021

Monitoring Well Identification	Top of Casing Elevation (feet) ¹	Depth to Groundwater (feet)	Groundwater Elevation (feet)
MW-1	398.39	8.4	389.99
MW-2	398.76	8.82	389.94
MW-3	398.80	9.05	389.75
MW-4	398.37	8.54	389.83
MW-6	401.37	12.25	389.12
MW-10	401.52	12.74	388.78
MW-17-2	398.28	8.42	389.86
MW-17-5	398.6	9.75	388.85

Key:

- ¹ Based on vertical control survey of July 21, 2021, based on an arbitrary datum of 400 feet established at a local benchmark in 2003.

Field Parameters. The results of intrinsic water quality parameters (temperature, pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), and specific conductance (SC)) measured during this monitoring event are presented in **Table 2**. ORP and pH levels are consistent with past monitoring events. There is variability in DO values between this monitoring event and past monitoring events. Compared to the October 6, 2020, sampling event, the DO levels decreased in monitoring wells MW-03, MW-04, and MW-17-5 and increased in MW-10, and MW-17-2. The SC levels are consistent with past monitoring events with the exception of MW-01 which was considerably lower and MW-04 which was considerably higher than during the October 6, 2020, monitoring event. Also, the high SC level and low pH level measured in MW-17-2 may be an indication of impact from the chemox treatment process.

Table 2 Field Measured Intrinsic Water Quality Parameters
Measurements taken on October 13, 2021

Monitoring Well Identification	Purged Volume (gallons)	Temperature (°C)	pH	DO (mg/L)	ORP (mV)	SC (µs/cm°C)
MW-01	7.92	3.7	6.64	4	59.3	63.6
MW-02	4.8	4.3	6.66	2.14	54.4	676
MW-03	10.1	4.1	6.78	1.69	49.4	692
MW-04	11.8	3.5	6.7	2.06	74.4	1000
MW-06	2.34	3.8	6.77	2.14	159.1	463
MW-10	3.12	4.0	7.17	2.85	128.8	346
MW-17-2	3.12	4.6	6.4	4.14	48.8	1530
MW-17-5	2.16	4.2	6.64	1.21	47.9	513

Key:
 °C degrees Celsius
 µs/cm°C microSiemens per centimeter degrees Celsius
 mg/L milligrams per liter
 mV millivolts
 DO Dissolved Oxygen

NM Not measured
 ORP oxidation-reduction potential
 pH log [H⁺]
 SC specific conductance corrected to 25 °C

Water Sample Analytical Results. Laboratory analytical results for BTEX, naphthalene, GRO, DRO, 1,2,4-TMB, 1,3,5-TMB, and Sodium in the groundwater samples collected during this monitoring event are summarized in **Tables 3**. The laboratory analytical report is provided in **Appendix E**. Historical monitoring data for this site are tabulated in **Appendix D**.

The concentrations of ethylbenzene, xylenes, GRO, and DRO are continuing to decrease in monitoring well MW-03 and MW-17-2. Monitoring well MW-17-5 had benzene, ethylbenzene, and xylenes levels that are consistent with past monitoring events and that GRO concentrations continue their general downward trend. Sodium concentrations in wells MW-17-2 and MW-17-5 have been increasing since first being tested in August 2020 suggesting the probable impact of the chemox treatments.

Table 3 Groundwater Analytical Results for BTEX, GRO, DRO, TMBs and Naphthalene
Samples collected on October 13, 2021

ID	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE (TOTAL)	GRO	DRO	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	NAPH-THALENE ¹	Sodium
UNITS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-01	0.000246 J	0.0883	0.00310	0.0332	0.315	1.33	0.00700	0.00152	U (0.000750)	34.3
MW-02	0.000702 J	U (0.001)	0.00768	0.0130	0.210	1.49	0.0174	0.00796	0.00129J	23.8
MW-03	0.0186 J	0.0856	0.248	1.80	7.35	2.16	0.639	0.204	0.0112	31.7
MW-04	U (0.001)	U (0.001)	U (0.001)	0.000454 J	U (0.100)	2.84	U (0.001)	U (0.001)	U (0.0005)	19.0
MW-06	U (0.001)	U (0.001)	U (0.001)	0.000221	U (0.1)	0.376 J	U (0.001)	U (0.001)	U (0.000250)	14.2
MW-10	0.00247	U (0.001)	U (0.001)	U (0.003)	U (0.1)	0.403 J	U (0.001)	U (0.001)	U (0.000250)	6.56
MW-17-02	0.00125 J	0.00253 J	0.0506	0.197	1.51	1.77	0.315	0.0692	0.00493	157
DUP1	0.00124	0.00156	0.0584	0.238	2.06	1.56	0.402	0.0819	0.00454	157
MW-17-05	0.0387	0.265	0.140	0.469	2.18	0.800 J	0.186	0.0964	0.00210	26.0
GCLS	0.0046	1.1	0.015	0.19	2.2	1.5	0.056	0.06	0.0017	NA

Key:

I Results from VOC Method 8260 D

Blank Trip Blank

Blank indicates the concentration exceeds the GCL or the estimated quantitation limit exceeds the GCL

J The identification of the analyte is acceptable; the reported value is an estimate.

DUP Duplicate sample of the preceding sample (MW-17-02).

DRO Diesel range organics analyzed by AK102.

GCLS Groundwater cleanup levels, 18 AAC 75.345, Table C, (9/18/2019)

GRO Gasoline range organics analyzed by AK101.

mg/L milligrams per liter

NA Not Applicable

U () Undetected above practical quantitation limits shown in parentheses.

Quality Assurance (QA)/Quality Control (QC) Review. PACE Analytical met all laboratory QA/QC criteria during the 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**.

Table 4 Laboratory Quality Control Objectives

Quality Control Designation	Tolerance	Results for this Event
Holding Times		
DRO/Water/to analyze	40 days	14 days
DRO/Water/to extract	14 days	13 days
GRO/Water/to analyze	14 days	9 days
VOCs/Water/to analyze	14 days	10 – 14 days
SVOCs/Water/to analyze	40 days	7 days
SVOCs/Water/to analyze	7 days	7 days
Field Duplicates – Precision		
Benzene	± 30%	<i>0.80 %</i>
Toluene	± 30%	47.43 %
Ethylbenzene	± 30%	14.31 %
Xylenes	± 30%	18.85 %
Naphthalene	± 30%	12.5 %
GRO	± 30%	30.81 %
DRO	± 30%	12.61 %

Key:
 % Absolute value percentage of variance
 ± Absolute Value
 DRO diesel range organics
 GRO gasoline range organics

SVOC Semi-volatile organic compound
 VOC Volatile organic compound
BOLD Exceeds precision tolerance
Italics The identification of the analyte is acceptable; the reported value is an estimate.

Sample DUP1 is a quality control duplicate of Sample MW-17-02. The duplicate sample set was collected to determine the precision of the field collection and laboratory analyses for this sampling event. Data presented in **Table 5** show that the precision for the duplicate sample set was within the established QA criteria tolerances for benzene, ethylbenzene, total xylenes, 1,2,4-TMB, 1,3,5-TMB, naphthalene, and DRO analytes while exceeding tolerance for toluene, and GRO. The holding times were within established criteria.

5.0 IN-SITU CHEMOX REMEDIATION

The remediation event on October 15, 2021, consisted of a chemical oxidation (chemox) injection of Klozur® One product combined with potable water from the convenience store into the following four remediation wells: RW-17-1, RW-17-3, RW-17-4 and RW-17-6. Klozur® One is a granular product manufactured by PeroxyChem that consists primarily of sodium persulfate and patented activator reagents. The chemox solution was hydraulically “pushed” into the subsurface

formation with the injection of additional potable water into each well. The amounts of Klozur[®] One and water injected into each well is shown below.

- RW-17-1: Chemox solution consisting of 137.5 pounds of Klozur[®] One with 275 gallons of potable water followed by an additional 120 gallons of potable water.
- RW-17-3: Chemox solution consisting of 27.5 pounds of Klozur[®] One with 55 gallons of potable water followed by an additional 5 gallons of potable water.
- RW-17-4: Chemox solution consisting of 82.5 pounds of Klozur[®] One with 165 gallons of potable water followed by an additional 55 gallons of potable water.
- RW-17-6: Chemox solution consisting of 137.5 pounds of Klozur[®] One with 275 gallons of potable water followed by an additional 120 gallons of potable water.

In summary, a total of 385 pounds of Klozur[®] One product mixed with 1,070 gallons of water was injected into the subsurface via the remediation wells during the chemox injection process.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following summarizes laboratory test results that exceeded the GCLs for the October 2020 semi-annual groundwater monitoring event:

- MW-02: Naphthalene
- MW-03: Benzene, ethylbenzene, total xylenes, GRO, DRO, 1-2-4 TMB, 1-3-5 TMB, and naphthalene.
- MW-04: DRO
- MW-17-2: Ethylbenzene, total xylenes, DRO, 1-2-4 TMB, 1-3-5 TMB, and naphthalene.
- MW-17-5: Benzene, ethylbenzene, total xylenes, 1-2-4 TMB, 1-3-5 TMB and naphthalene.

Results from the groundwater depth measurements indicate the average hydraulic gradient across the site was approximately 0.0055 feet per foot with flow tending toward the northeast at 50 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

No anomalies were found during the October 2021 semi-annual monitoring event that would require additional corrective action or changes to the approved year 2021 Corrective Action Work Plan for this site.

7.0 LIMITATIONS

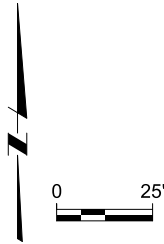
Stantec conducted this monitoring event in accordance with the Corrective Action Work Plan approved by ADEC, and in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. All sampling activities were completed in accordance 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, LLC Store 5310,

formally known as Tesoro 2 Go Mart #112 and Tesoro Refining and Marketing Company. Information herein is for use at this site in accordance with the purpose of the report described.

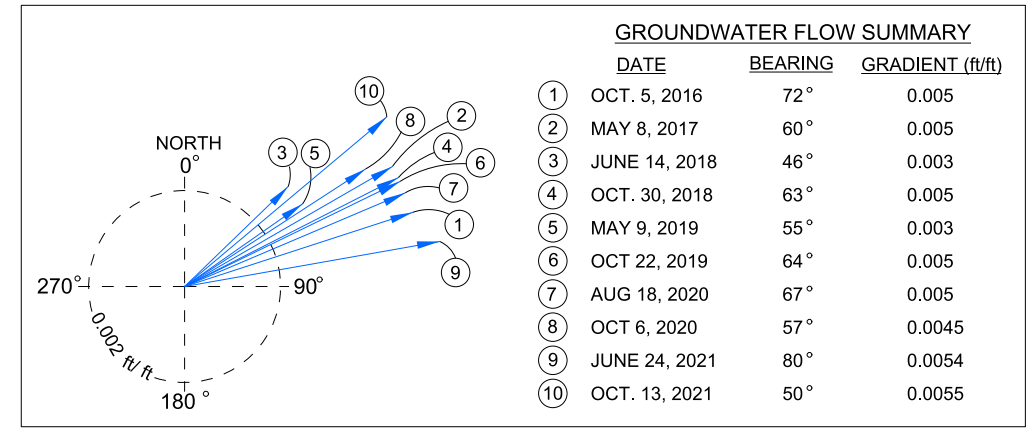
FIGURES

- | | |
|----------|---|
| Figure 1 | Location and Vicinity Map |
| Figure 2 | Site Plan with Groundwater Detections and Exceedances |
| Figure 3 | Remediation System Layout |
-





COLONIAL PLAZA MALL
 DRINKING WELL,
 MORNING STAR SUB. TRACT D
 APPROXIMATELY 180'
 NORTH OF THIS POINT



MW-4

Benzene	U (0.001)
Toluene	U (0.001)
Ethylbenzene	U (0.001)
Xylenes	0.000454
GRO	U (0.100)
DRO	2.84
1,2,4-Trimethylbenzene	U (0.001)
1,3,5-Trimethylbenzene	U (0.001)
Naphthalene	U (0.0005)
Sodium	-19.0
Gw Elev	-389.83

MW 17-2

Benzene	0.00125
Toluene	0.00253
Ethylbenzene	0.0506
Xylenes	0.197
GRO	1.51
DRO	1.77
1,2,4-Trimethylbenzene	0.315
1,3,5-Trimethylbenzene	0.0692
Naphthalene	0.00493
Sodium	-157
Gw Elev	-389.86

MW 17-2 (Duplicate)

Benzene	0.00124
Toluene	0.00156
Ethylbenzene	0.0584
Xylenes	0.238
GRO	2.06
DRO	1.56
1,2,4-Trimethylbenzene	0.402
1,3,5-Trimethylbenzene	0.0819
Naphthalene	0.00435
Sodium	-157
Gw Elev	-389.86

MW 17-5

Benzene	0.0387
Toluene	0.265
Ethylbenzene	0.140
Xylenes	0.469
GRO	2.18
DRO	0.800
1,2,4-Trimethylbenzene	0.186
1,3,5-Trimethylbenzene	0.0964
Naphthalene	0.00210
Sodium	26.0
Gw Elev	-388.85

MW-1

Benzene	0.000246
Toluene	0.0883
Ethylbenzene	0.00310
Xylenes	0.0332
GRO	0.315
DRO	1.33
1,2,4-Trimethylbenzene	0.00700
1,3,5-Trimethylbenzene	0.00152
Naphthalene	U (0.000750)
Sodium	34.3
Gw Elev	-389.99

MW-2

Benzene	0.000702
Toluene	U (0.001)
Ethylbenzene	0.00768
Xylenes	0.0130
GRO	0.210
DRO	1.49
1,2,4-Trimethylbenzene	0.0174
1,3,5-Trimethylbenzene	0.00796
Naphthalene	U (0.0005)
Sodium	-23.8
Gw Elev	-389.94

MW-10

Benzene	0.00247
Toluene	U (0.001)
Ethylbenzene	U (0.001)
Xylenes	U (0.003)
GRO	U (0.1)
DRO	0.403
1,2,4-Trimethylbenzene	U (0.001)
1,3,5-Trimethylbenzene	U (0.001)
Naphthalene	U (0.000250)
Sodium	-6.56
Gw Elev	-388.78

MW-6

Benzene	U (0.001)
Toluene	U (0.001)
Ethylbenzene	U (0.001)
Xylenes	0.000221
GRO	U (0.1)
DRO	0.376
1,2,4-Trimethylbenzene	U (0.001)
1,3,5-Trimethylbenzene	U (0.001)
Naphthalene	U (0.000250)
Sodium	-14.2
Gw Elev	-389.12

MW-3

Benzene	0.0186
Toluene	0.0856
Ethylbenzene	0.248
Xylenes	1.80
GRO	7.35
DRO	2.16
1,2,4-Trimethylbenzene	0.639
1,3,5-Trimethylbenzene	0.204
Naphthalene	0.0112
Sodium	31.7
Gw Elev	-389.75

LEGEND:

- PROPERTY LINE
- ▲ MONITORING WELL
- DRO DIESEL RANGE ORGANICS
- GRO GASOLINE RANGE ORGANICS
- Gw Elev. GROUNDWATER ELEVATION IN FEET
- NM NOT MEASURED
- PP POWER POLE
- U UNDETECTED ABOVE PRACTICAL QUANTITATION LIMITS SHOWN IN PARENTHESES
- UST UNDERGROUND STORAGE TANK

NOTES:

- RESULTS SHOWN ARE FOR WELLS SAMPLED ON OCTOBER 13, 2021
- RESULTS ARE IN MILLIGRAMS PER LITER
- BOLD/ RED TEXT INDICATES CONTAMINANT CONCENTRATIONS ABOVE CLEANUP LEVELS FOR THIS SITE



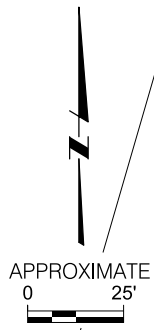
SPEEDWAY 5310
 (Former Tesoro TGMart #112)
 4Q - OCTOBER 2021 GWM EVENT REPORT

SITE PLAN WITH
 GROUNDWATER DETECTIONS
 AND EXCEEDANCES

FIGURE

2

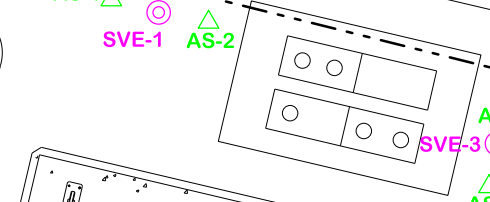
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TRACT A-1

BADGER ROAD

AS-1
SVE-1 AS-2



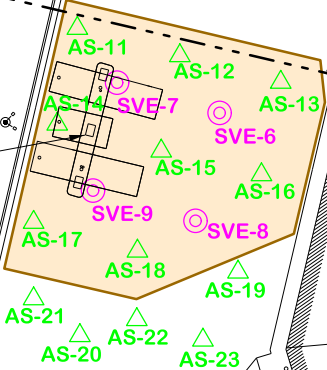
FUEL DISPENSER CANOPY

UST

AS-5
SVE-3
AS-6
AS-7
SVE-4
AS-8

PP

FORMER UST FUELING SYSTEM



AS-11 AS-12 AS-13
AS-14 SVE-7 AS-15
AS-16
SVE-9 SVE-8
AS-17 AS-18 AS-19
AS-20 AS-22 AS-23

AS-9
SVE-5
AS-10

TESORO 2 GO MART #112

TRACT A-2

BEAVER SPRINGS CREEK

LEGEND:

- PROPERTY LINE
- INACTIVE SOIL VAPOR EXTRACTION WELL
- INACTIVE AIR SPARGE WELL
- PRIMARY AREA OF TREATMENT
- PP POWER POLE
- UST UNDERGROOUND STORAGE TANK

FILE: C:\D\CAD\Proj\Speedway_Tesoro\Speedway_5310 (TGMart112)_185705374\MonEvent\2021\4Q_December 2021\Fig03 - Remed System Layout.dgn

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SPPEEDWAY 5310
(Former Tesoro TGMart #112)
4Q - OCTOBER 2021 GWM EVENT REPORT

REMEDATION SYSTEM LAYOUT

FIGURE
3

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300.100

APPENDIX A

Site Background

APPENDIX A – SITE BACKGROUND

Speedway Store 5310 (former Tesoro 2 Go Mart #112) 3392 Badger Road, North Pole, Alaska)
ADEC Facility ID #1116; ADEC File #100.26.159

Tesoro 2 Go Mart #112 is a retail fuel service/convenience store located northeast of the Richardson Highway overpass on Badger Road in North Pole, Alaska. The property is approximately 1.9 acres in size and the legal description is Tract A-2, Morningstar Subdivision. The store is in the north end of a small strip mall. Beaver Springs Creek flows to the north immediately behind the strip mall. Three underground storage tanks (USTs) were initially installed to serve the original convenience store in December 1984.

November 1996. During field installation of a cathodic protection system on the USTs, a petroleum hydrocarbon release was discovered in several subsurface boreholes drilled around the perimeter of the USTs.

May 1997. Gilfilian Engineering and Environmental Testing, Inc. (GE²T) completed a Phase 1 Release Investigation (RI) at the site and installed four groundwater monitoring wells. In addition, representative water samples were collected from the mall drinking water system (served by an on-site water well) and from Beaver Springs Creek. Petroleum contaminants were detected above Alaska Department of Environmental Conservation (ADEC) cleanup levels in samples collected from all four soil borings/monitoring wells. Petroleum contaminants were detected at very low concentrations in the creek water samples, and none in the drinking water sample.

September 1997. Free phase petroleum was discovered in two of the four groundwater monitoring wells at the site, and dissolved petroleum contaminants was detected above ADEC groundwater cleanup levels (GCLs) in the other two monitoring wells.

March 1998. A well search was conducted within a ¼-mile radius of the site. The findings of the well search noted there were approximately 24 domestic water supply wells within the search radius.

August/September 1998. GE²T conducted a UST Closure Site Assessment (SA) at the site. Three USTs and associated piping and dispensers were removed from the site and a new UST system was installed on an adjacent downgradient lot (to the north) of the site on Tract A-1 Morning Star Subdivision. Petroleum hydrocarbon contamination was found in the monitoring wells constructed in the area of the former and new UST systems. Seven soil vapor extraction (SVE) wells and sixteen air sparge (AS) wells systems were installed at the site for remediation of contamination found in the vadose soil zone and groundwater table beneath the site. Additional AS and SVE wells were installed at a later date

September 1999. An SA was completed for the removal of the new UST that were installed in September 1998 and replace with a new UST. Soil contamination was discovered in the area of

the replacement UST system. Contaminated soil was removed and transported off-site for thermal treatment.

June 2000. GE²T conducted a RI for installation of an additional monitoring well (MW-6) at the site. No contaminants were detected in soil samples from the boring.

March 2001. A Falco 300 Cat-Ox unit was installed as part of the remediation system to treat vapors captured in the SVE system.

September/October 2003. MWH Americas, Inc. (MWH) completed a RI that included the installation of additional AS and groundwater monitoring wells. The RI involved drilling five soil borings, of which four were completed as AS wells (AS-20, AS-21, AS-22, and AS-23) and one monitoring well (MW-7). Contaminants were detected in soil from borings MW-7, AS-20, and AS-21 and the water sample from MW-7.

March 2004. MWH completed a RI that involved the drilling two soil borings. These borings were completed as 2-inch diameter monitoring wells (MW-8 and MW-9). Laboratory results indicate that no contaminants were detected in the soil or groundwater samples collected.

September 2004. MWH completed a RI that involved the drilling of one soil boring. The boring that was completed as 2-inch diameter monitoring well (MW-10). Laboratory results indicate that no contaminants were detected in the soil samples collected. Benzene was detected above the GCL water sample collected from MW-10.

May 2005. Benzene, toluene, ethylbenzene, GRO, and DRO were detected above the ADEC GCLs in Monitoring Well MW-3. Benzene, GRO, and DRO were also detected above the GCLs in Monitoring Well MW-2. No analytes of concern were detected above the GCLs in any of the other tested wells. The AS and SVE systems remained in operation.

September 2005. Benzene, GRO, and DRO were detected above the ADEC GCLs in Monitoring Wells MW-2 and MW-3. Toluene was also detected above the GCL in Monitoring Well MW-3. No analytes of concern were detected above the GCLs in Monitoring Well MW-10. The AS and SVE systems remained in operation. The SVE exhaust vapor concentrations had decreased to a relatively low level that no longer necessitated the use of the catalytic oxidizer unit. Therefore, the catalytic oxidizer was disconnected from the SVE system in summer 2005.

May 2006. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above the ADEC GCLs in Monitoring Well MW-3. GRO and DRO were also detected above the GCLs in Monitoring Well MW-2. No analytes of concern were detected above the GCLs in Monitoring Wells MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, and MW-10. The AS and SVE system were shut down until system maintenance could be performed.

November 2006. Benzene, toluene, ethylbenzene, and gasoline range organics were detected above the ADEC GCLs in Monitoring Wells MW-2 and MW-3. Xylenes and diesel range organics

were also detected above the GCLs in Monitoring Well MW-3. No analytes of concern were detected above the GCLs in Monitoring Well MW-10. AS and SVE system were brought back online after system repair was performed.

May 2007. GRO and DRO were detected above the ADEC GCLs in Monitoring Wells MW-2 and MW-3. Benzene, toluene, ethylbenzene, and xylenes were detected above the practical quantitation limits (PQLs) in Monitoring Wells MW-2 and MW-3, but only benzene was above the GCL. DRO was detected above the PQL, but below the GCL, in Monitoring Wells MW-4 and MW-5. No analytes of concern were detected above the PQLs in Monitoring Wells MW-1, MW-6, MW-8, MW-9, and MW-10. AS and SVE system remain in operation.

April 2008. DRO was detected above the ADEC GCLs in Monitoring Wells MW-2, MW-3, and MW-4. GRO were detected above the ADEC GCLs in Monitoring Wells MW-3 and MW-4. Benzene was also detected above the GCLs in Monitoring Well MW-3. DRO in Monitoring Well MW-1; ethylbenzene, xylenes, and GRO in MW-2; toluene, ethylbenzene, and xylenes in Monitoring Well MW-3; and benzene, toluene, ethylbenzene, and xylenes in Monitoring Well MW-4 were detected above the PQLs, but below the GCLs. No analytes were detected above the PQLs in Monitoring Wells MW-5 through MW-10. AS and SVE system remain in operation.

October 2008. DRO were detected above the ADEC GCL in Monitoring Well MW-3. GRO were detected above the GCL in Monitoring Wells MW-2 and MW-3. All other analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-2 and MW-3. No analytes were detected above the PQLs in Monitoring Well MW-10. AS and SVE system remain in operation.

May 2009. Diesel range organics were detected above the ADEC GCLs in Monitoring Wells MW-1, MW-2, and MW-3. GRO were detected above the GCL in Monitoring Wells MW-2 and MW-3. Benzene was detected above the GCL in Monitoring Well MW-3. All other analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-2 and MW-3. Toluene in Monitoring Wells MW-1 through MW-4, and MW-8; ethylbenzene in Monitoring Wells MW-1 through MW-3, MW-7, and MW-8; xylenes in Monitoring Wells MW-1 through MW-4 and MW-7 through MW-9; and GRO in Monitoring Well MW-7 were detected above PQLs but below GCLs. All other analytes in the above wells sampled were not detected above the PQLs. No analytes were detected above the PQLs in Monitoring Wells MW-5, MW-6, and MW-10. AS and SVE system remain in operation.

October 2009. All analytes tested were detected above the ADEC GCLs in Monitoring Well MW-3. Ethylbenzene and gasoline range organics were detected above the GCLs in Monitoring Well MW-2. Benzene, toluene, xylenes, and diesel range organics were detected above the practical quantitation limits, but below the GCLs, in Monitoring Well MW-2. No analytes of concern were detected above the practical quantitation limits in Monitoring Well MW-10. AS and SVE system remain in operation.

June 2010. Benzene, GRO, and DRO were detected above the ADEC groundwater cleanup levels GCLs in Monitoring Well MW-3. Toluene, ethylbenzene, and xylenes were detected above the

PQLs, but below the GCLs, in Monitoring Well MW-3. Benzene, toluene, ethylbenzene, xylenes, and GRO were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-1 and MW-2. DRO was also detected above the PQL, but below the GCL, in Monitoring Well MW-2. No analytes of concern were detected above the PQLs in Monitoring Wells MW-4, MW-6, or MW-10. AS and SVE system remain in operation. Measurements of the SVE exhaust with a PID indicated low amounts of volatile petroleum hydrocarbons are being removed from the vadose soil zone.

October 2010. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above the ADEC GCLs in Monitoring Well MW-3. GRO was detected above the GCL in Monitoring Well MW-2. Benzene, toluene, ethylbenzene, xylenes, and DRO were detected above the PQLs, but below the GCLs, in Monitoring Well MW-2. No analytes of concern were detected above the PQLs in Monitoring Well MW-10. AS and SVE system remain in operation.

May 2011. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above the ADEC GCLs in Monitoring Well MW-3. GRO and DRO were detected above the GCL in Monitoring Well MW-2. Benzene, toluene, ethylbenzene, and xylenes were detected above the PQLs, but below the GCLs, in Monitoring Well MW-2. Toluene, ethylbenzene, xylenes, GRO, and DRO were also detected above the PQLs, but below the GCLs, in Monitoring Well MW-1. Benzene was not detected above the PQL in Monitoring Well MW-1. No analytes of concern were detected above the PQLs in Monitoring Wells M-4, MW-6, and MW-10. AS and SVE system remain in operation.

October 2011. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above the ADEC GCLs in Monitoring Well MW-3. GRO was detected above the GCL in Monitoring Well MW-2. Ethylbenzene, xylenes, and DRO were detected above the PQLs, but below the GCLs, in Monitoring Well MW-2. Benzene and toluene were not detected above the PQLs in MW-2; however, the PQL for benzene is above the GCL and the result might exceed the GCL. No analytes of concern were detected above the PQLs in Monitoring Wells MW-6 and MW-10. The AS and SVE systems remain in operation on a full-time basis.

May 2012. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. Benzene and GRO were detected above GCLs in Monitoring Well MW-2. Benzene, toluene, ethylbenzene, xylenes, and GRO were detected above PQLs and below GCLs in Monitoring Well MW-1. Toluene, ethylbenzene, and xylenes were detected above PQLs and below GCLs in Monitoring Well MW-2. No other analytes were detected above the PQLs in any of the samples collected during this monitoring event. The AS and SVE systems remained in operation on a full-time basis.

October 2012. Benzene and GRO were detected above GCLs in Monitoring Well MW-3. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above PQLs and below GCLs in Monitoring Well MW-2. Toluene, ethylbenzene, xylenes, and DRO were detected above PQLs and below GCLs in Monitoring Well MW-3. The AS and SVE systems were taken offline pending repairs and improvements. A total of 130 gallons of Klozur CR[®] was applied at the site

over two events. Approximately 10 gallons of Klozur CR was poured into SVE-7, and approximately 55 gallons into SVE-9 on August 29, 2012. Additionally, 65 gallons of Klozur CR were injected into Well SVE-9 on October 9, 2012.

May 2013. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. Benzene, ethylbenzene, xylenes, GRO, and DRO were detected above PQLs but below GCLs in Monitoring Well MW-1. Benzene, toluene, ethylbenzene, xylenes, and GRO were detected above PQLs but below GCLs in Monitoring Well MW-2. The AS and SVE systems remain offline pending repairs and improvements.

September 2013. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. GRO was detected above GCL in Monitoring Well MW-2. Benzene, toluene, ethylbenzene, xylenes, and DRO were detected above PQLs but below GCLs in Monitoring Well MW-2. The AS and SVE systems remain offline pending repairs and improvements.

May 2014. Benzene, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. Ethylbenzene, xylenes, and DRO were detected above PQL and below GCLs in Monitoring Well MW-1. Benzene, ethylbenzene, xylenes, GRO, and DRO were detected above PQLs but below GCLs in Monitoring Well MW-2. Toluene, ethylbenzene, and xylenes were detected above PQLs and below GCLs in Monitoring Well MW-3. Xylenes were detected above PQLs but below GCLs in Monitoring Well MW-10. The AS and SVE systems remain offline pending repairs and improvements.

September 2014. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. Benzene, toluene, ethylbenzene, xylenes, and GRO were detected above PQLs and below GCLs in Monitoring Well MW-2. The AS and SVE systems remain offline pending repairs and improvements.

May 2015. Benzene, toluene, ethylbenzene, xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. DRO was detected above GCL in Monitoring Wells MW-1 and MW-2. Toluene, ethylbenzene, xylenes, and GRO were detected above PQLs but below GCLs in Monitoring Well MW-1. Benzene, ethylbenzene, xylenes, and GRO were detected above PQLs but below GCLs in Monitoring Well MW-2. DRO was detected above PQL but below GCL in Monitoring Well MW-4. The AS and SVE systems remain offline pending repairs and improvements.

October 2015. Benzene and GRO were detected above GCLs in Monitoring Well MW-2. Benzene, toluene, ethylbenzene, total xylenes, GRO, and DRO were detected above GCLs in Monitoring Well MW-3. One or more analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-2 (all analytes), MW-6 (DRO), and MW-10 (DRO). The AS and SVE systems remain offline pending repairs and improvements. Chemical oxidation of the groundwater at the site was conducted on October 6, 2015, with the injection of Klozur CR[®] into

Injection Well SVE-6 and well clusters SVE-7 and SVE-9 located at the footprint of the former underground storage tanks (USTs – Figure 3). Follow-up intrinsic measurements indicated negligible influence of the injection on groundwater at Monitoring Well MW-3.

May 2017. Results of analytical sampling showed concentrations exceeding the GCLs for:

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

One or more analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-1, MW-2, MW-3, MW-4, and MW-10.

September 2017: Results of the semi-annual groundwater monitoring event conducted in September 2017 showed concentrations exceeding the GCLs for ethylbenzene in Monitoring Well MW-2; and benzene, ethylbenzene, xylenes, GRO, and DRO in MW-3. Monitoring Wells MW-6 and MW-10 were found to be absent of contaminants of concern. These findings are similar to results found in previous monitoring events

June 2018. Results of analytical sampling showed concentrations exceeding the GCLs for:

- Monitoring Well MW-1: 1,2,4-trimethylbenzene.
- Monitoring Well MW-2: ethylbenzene, 1,2,4-trimethylbenzene, benzopyrene, and indenopyrene.
- Monitoring Well MW-3: benzene, ethylbenzene, xylenes, GRO, DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene.
- Monitoring Well MW 17-5: benzene, ethylbenzene, xylenes, and 1,2,4-trimethylbenzene.

One or more analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-1, MW-2, MW-3, MW-4, and MW-17-5.

October 2018. The following summarizes results exceeding the GCLs for the October 2018 semi-annual groundwater monitoring event:

- Monitoring Well MW-2: ethylbenzene and DRO.
- Monitoring Well MW-3: benzene, ethylbenzene, xylenes, GRO, DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene.
- Monitoring Well MW 17-2: ethylbenzene, xylenes, GRO, DRO and 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene.
- Monitoring Well MW 17-5: benzene, ethylbenzene, xylenes, GRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene

One or more analytes were detected above the PQLs, but below the GCLs, in Monitoring Wells MW-2, MW-3, MW-6, and MW-17-5.

In addition, several volatile organic compounds (VOCs) were reported by the laboratory as undetected but had laboratory reporting limits that equaled or exceeded their corresponding GCLs.

The chemical oxidation (chemox) treatment process was delayed until the third quarter of 2018 due to replacement of the chemical oxidant. In September 2018, Stantec completed an injection of the replacement chemox product, Klozur One[®], into the four remediation wells. Klozur One[®] is a granular product manufactured by PeroxyChem that consists primarily of sodium persulfate and patented activator reagents. A total of 220 pounds of Klozur One[®] product was mixed with clean water and then manually injected as a solution into the contaminated source area via Remediation Wells RM17-1, RM17-3, RM17-4, and RM17-6. Each of the four remediation wells received 55 pounds of Klozur One[®] that was prepared as a solution with 50 gallons of clean water. Following the injection of the chemox solution, a combined total of 550 gallons of clean water was injected in all the wells. It was noted that each of the remediation wells had different acceptance rates for delivery of the clean water that ranged from 55 to 210 gallons each.

May 2019. This May 2019 semi-annual 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, MW-6, MW-10, MW 17-2, and MW 17-5. The methods that were used for this monitoring event were conducted in accordance with the Alaska Department of Environmental Conservation (ADEC) approved 2019 Corrective Action Work Plan for this site.

Results from the groundwater depth measurements indicate the average hydraulic gradient was approximately 0.003 feet per foot with flow tending toward the northeast at 55 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

Results of the analytical sampling showed concentrations exceeding the ADEC groundwater cleanup levels (GCLs) for the following monitoring wells:

- Monitoring Well MW-2: ethylbenzene.
- Monitoring Well MW-3: benzene, ethylbenzene, xylenes, gasoline range organics (GRO), and naphthalene.
- Monitoring Well MW 17-5: ethylbenzene.

October 2019. This October 2019 semi-annual 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, MW-6, MW-10, MW 17-2, and MW 17-5. The methods that were used for this monitoring event were conducted in accordance with the ADEC approved 2020 Corrective Action Work Plan for this site.

Results from the groundwater depth measurements indicate the average hydraulic gradient was approximately 0.005 feet per foot with flow tending toward the northeast at 64 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

Results of the analytical sampling showed concentrations exceeding the ADEC GCLs for the following monitoring wells:

- Monitoring Well MW-2: ethylbenzene.
- Monitoring Well MW-3: benzene, ethylbenzene, xylenes, GRO, and DRO.
- Monitoring Well MW 17-2: ethylbenzene, xylenes, and GRO.
- Monitoring Well MW 17-5: benzene, ethylbenzene, xylenes, and GRO.

Stantec completed an injection of 220 pounds of the chemox product, Klozur One[®], into the four remediation wells (RW17-1, RW17-3, RW17-4, and RW17-6).

August 2020. The semi-annual groundwater monitoring event included measuring the depth to groundwater, measuring water quality parameters, and collecting and analyzing groundwater samples from Monitoring Wells MW-2, MW-3, MW-6, MW-10, MW17-2, and MW17-5. The methods that were used for this monitoring event were conducted in accordance with the Alaska Department of Environmental Conservation (ADEC) approved 2020 Corrective Action Work Plan for this site.

Results from the groundwater depth measurements indicate the average hydraulic gradient was approximately 0.005 feet per foot with flow tending toward the northeast at 67 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

The following summarizes laboratory test results that exceeded the GCLs for the August 2020 semi-annual groundwater monitoring event:

- Monitoring Well MW-3: Benzene, Ethylbenzene, Total Xylenes, 1-2-4 Trimethylbenzene, 1-3-5 Trimethylbenzene, Naphthalene, GRO, and DRO.
- Monitoring Well MW 17-2: Ethylbenzene, Total Xylenes, 1-2-4 Trimethylbenzene, 1-3-5 Trimethylbenzene, Naphthalene, and DRO.
- Monitoring Well MW 17-5: Benzene, Ethylbenzene, Total Xylenes, 1-2-4 Trimethylbenzene, 1-3-5 Trimethylbenzene, Naphthalene, and GRO.

Stantec completed an injection of 440 pounds of the chemox product, Klozur One[®], into the four remediation wells (RW17-1, RW17-3, RW17-4, and RW17-6).

October 2020. This October 2020 semi-annual groundwater monitoring event included measuring the depth to groundwater, measuring water quality parameters, and collecting and analyzing groundwater samples from Monitoring Wells MW-2, MW-3, MW-6, MW-10, MW 17-2, and MW 17-5. The methods that were used for this monitoring event were conducted in accordance with the ADEC approved 2020 Corrective Action Work Plan for this site.

Analytes in exceedance included: benzene, ethylbenzene, and xylenes (BTEX); gasoline range organics (GRO); diesel range organics (DRO), and naphthalene.

- MW-3: Benzene, Ethylbenzene, Total Xylenes, Naphthalene, GRO, and DRO.
- MW 17-2: Ethylbenzene, Total Xylenes, DRO, and Naphthalene.
- MW 17-5: Benzene, Ethylbenzene, Total Xylenes, and Naphthalene.

Results from the groundwater depth measurements indicate the average hydraulic gradient was approximately 0.0045 feet per foot with flow tending toward the northeast at 57 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

Stantec completed an injection of 440 pounds of the chemox product, Klozur One[®], into the four remediation wells (RW17-1, RW17-3, RW17-4, and RW17-6).

October 2021. This October 2021 semi-annual groundwater monitoring event included measuring the depth to groundwater, measuring water quality parameters, and collecting and analyzing groundwater samples from Monitoring Wells MW-01, MW-02, MW-03, MW-04, MW-06, MW-10, MW-17-2, and MW-17-5. The methods that were used for this monitoring event were conducted in accordance with the ADEC approved 2021 Corrective Action Work Plan for this site.

The following summarizes laboratory test results that exceeded the GCLs for the October 2021 semi-annual groundwater monitoring event:

- MW-02: Naphthalene
- MW-03: Benzene, ethylbenzene, total xylenes, GRO, DRO, 1,2,4-trimethylbenzene (1,2,4-TMB), 1,3,5-trimethylbenzene (1,3,5-TMB), and naphthalene.
- MW-04: DRO
- MW-17-2: Ethylbenzene, total xylenes, DRO, 1,2,4-TMB, 1,3,5-TMB, and naphthalene.
- MW-17-5: Benzene, ethylbenzene, total xylenes, 1,2,4-TMB, 1,3,5-TMB and naphthalene.

Based on the Surfer[®] software program, the average groundwater hydraulic gradient across the site was approximately 0.0055 feet per foot with flow tending toward the northeast at 50 degrees. The flow direction and gradient for this monitoring event were consistent with the historical values for this site.

The remediation event on October 15, 2021, consisted of a chemical oxidation (chemox) injection of Klozur[®] One product combined with potable water from the convenience store into four remediation wells (RW-17-1, RW-17-3, RW-17-4 and RW-17-6). Klozur[®] One is a granular product manufactured by PeroxyChem that consists primarily of sodium persulfate and patented activator reagents. The solution was hydraulically “pushed” into the subsurface formation with the injection of additional potable water into each well. In summary, a total of 385 pounds of Klozur[®] One product mixed with 1,070 gallons of water was injected into the subsurface via the remediation wells during the chemox injection process.

APPENDIX B

Field Methods and Procedures

ADEC Approved Work Plan Tasks for 2021

- Task 1 –Groundwater Monitoring

This task consists of semi-annual monitoring of six groundwater monitoring wells and annual monitoring of two additional monitoring wells. Sampling locations and analyses for the groundwater monitoring wells and remediation wells are listed on the 2021 Work Plan Schedule below.

Work Plan Task		1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
Task 1	Monitoring Wells: MW-2, MW-3, MW-6, MW-10, MW-17-2 and MW-17-5.		V, G, D, I & S		V, G, D, I, S & P
	Monitoring Wells MW-1 and MW-4				V, G, D, I, S & P
Task 2	Chemical Oxidation Treatment		✓	✓	✓

Key:

AK – Alaska Test Method

D – Diesel range organics by AK102.

E – Drinking water parameters by EPA Method 524.1.

G – Gasoline range organics by AK101.

I – Intrinsic indicators consisting of 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).

- Task 4 – Chemical Oxidation Treatment

Stantec proposes to provide chemical oxidation treatment of the petroleum contaminated soil and groundwater located in the source area of the former underground storage tank (UST) system. The chemox injection will occur three times in the 2nd, 3rd and 4th quarters of the year into the following injection wells: RM17-1, RM17-3, RM17-4, and RM17-6. The first annual injection will occur in the spring of the year after the winter frost dissipates, and the second and third injections will take place several months later just prior to winter freeze-up. Approximately 100 gallons of a prepared solution of clean water and 110 pounds of Klozur One® will be manually injected via gravity and/or a low pressure booster pump into each of the four remediation wells. Following the injection of the chemox solution, a minimum of 100 gallons of clear water will be injected into each injection well to provide a means of “hydraulically pushing” the chemox solution into the subsurface

formation. In addition, the groundwater monitoring wells will be sampled for sodium to check on the distribution/migration of the oxidant.

The Corrective Action 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 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 Work Plan Schedule shown above.

APPENDIX C

*Field Measurements, Notes, and
Groundwater Elevation Contours*

**Appendix C
Field Measurements and Notes**

Project: TNS #112

Date: 10/13/2021

Project number: 185705374

Samplers: Leslie Petre and Geoff Moorhead

Weather:

Well ID	Volume Purged (gallons)	Sheen/Odor	Temp. (°C)	pH	Dissolved Oxygen (mg/l)	ORP (mV)	Specific Conductance (µs/cm)	Top of Casing* (feet)	Depth to Groundwater (feet btoc)	Water Column (feet)	Depth to Bottom (feet btoc)
MW-1	7.92	N/N	3.7	6.64	4	59.3	0.0636	398.39	8.4	4.04	12.44
MW-2	4.8	Y/Y	4.3	6.66	2.14	54.4	0.676	398.76	8.82	2.43	11.3
MW-3	10.1		4.1	6.78	1.69	49.4	0.692	398.80	9.05	5.17	14.22
MW-4	11.8	N/N	3.5	6.7	2.06	74.4	1.0	398.37	8.54	6.03	14.57
MW-6	2.34	N/N	3.8	6.77	2.14	159.1	0.463	401.37	12.25	4.77	17.02
MW-10	3.12	N/N	4	7.17	2.85	128.8	0.346	401.52	12.74	6.4	19.1
MW17-2	3.12	N/Y	4.6	6.4	4.14	48.8	1.53	398.28	8.42	6.36	14.78
MW17-5	2.16	N/Y	4.2	6.64	1.21	47.9	0.513	398.6	9.75	4.41	14.16

NC - Not Calculated

NP - Not Purged

* Based on a vertical control survey of July 2021, using an arbitrary datum.

** Depths from previous records.

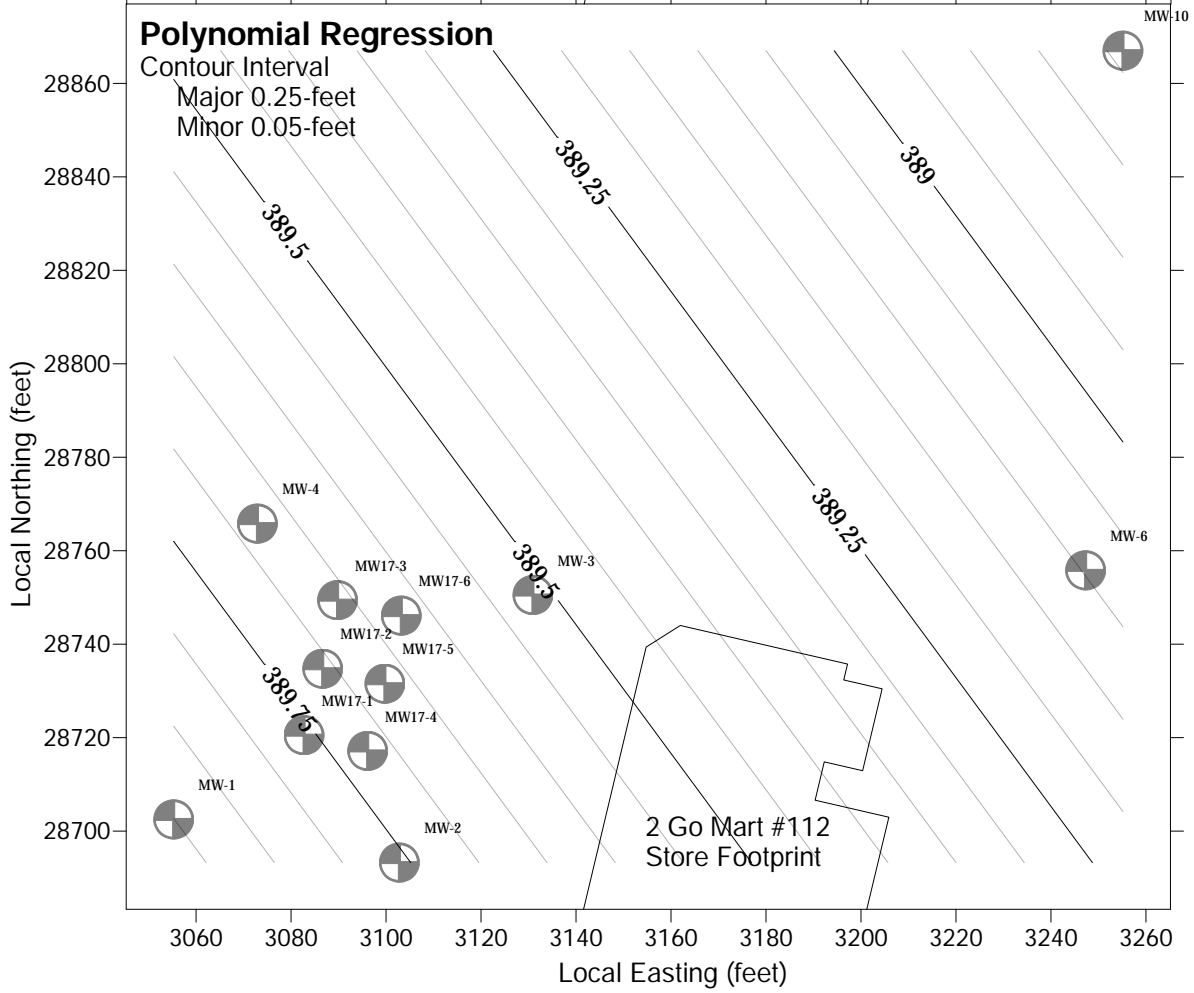
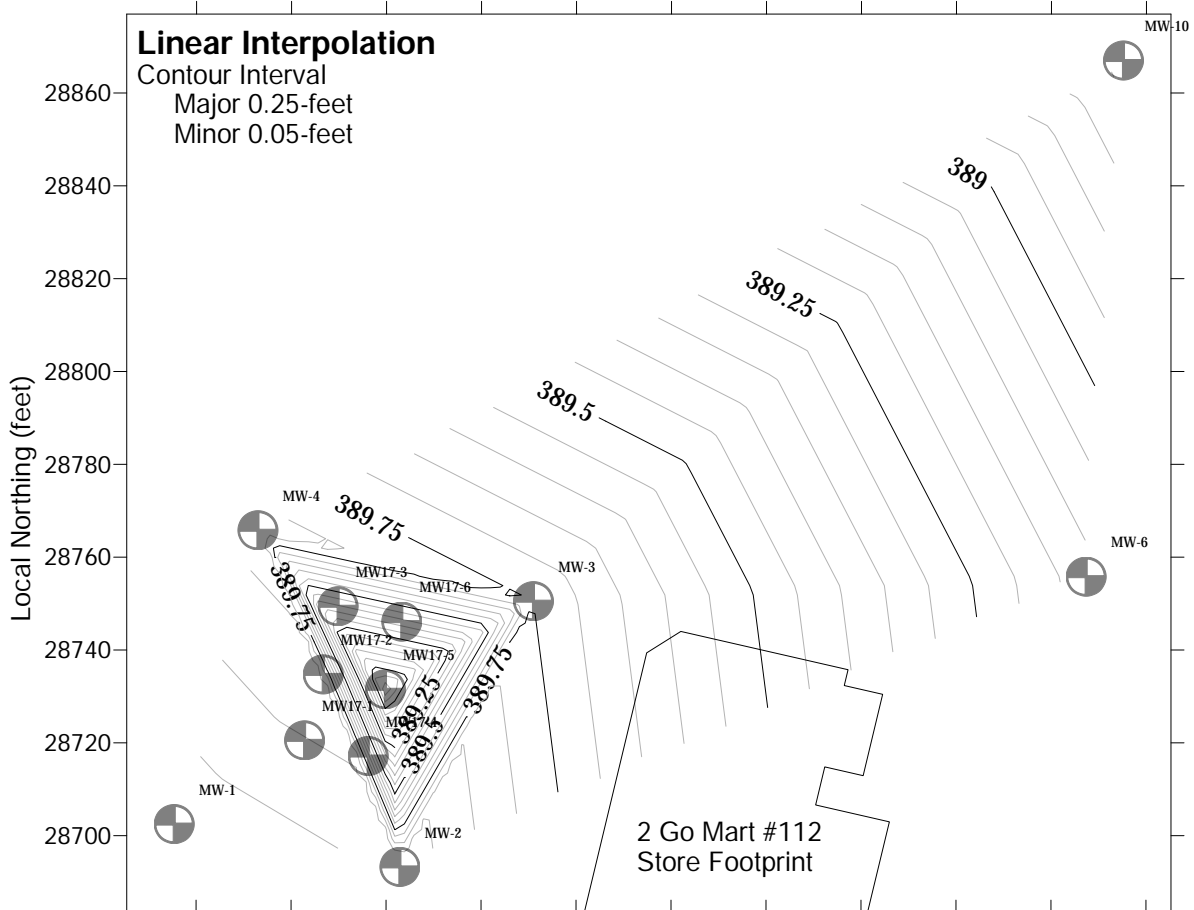
Well ID	Notes	Well Dia.	Date	Sample Time
MW-1	went dry during bailing	4"	10/13/2021	12:40:00 PM
MW-2	green sheen and smelly	4"	10/13/2021	2:25:00 PM
MW-3	dark, fuel smell	4"	10/13/2021	2:55:00 PM
MW-4	very dark and silty	4"	10/13/2021	12:00:00 PM
MW-6	light grey and silty	2"	10/13/2021	10:38:00 AM
MW-10	light grey and silty	2"	10/13/2021	11:05:00 AM
TNS 112 Dup	MW 17-2	--	10/13/2021	1:05:00 PM
MW17-2	stinky	2"	10/13/2021	1:05:00 PM
MW17-5	stinky	2"	10/13/2021	1:45:00 PM

Instruments / methods used	Model
Static water level	Solinst
pH	YSI
Conductivity	YSI
Dissolved Oxygen	YSI
Temperature	YSI
ORP	YSI

Lab Analytical Methods:	
VOCs (8260 C)	
GRO (AK101)	
DRO (AK102)	
Nathphalene (8270D)	
Sodium	

Purge Volumes calculated with Hydro-terra.com "Well Volume Calculator"

Tesoro 2 Go Mart #112 - October 13, 2021 Groundwater Elevation Contours



Elevations based on a vertical control survey of July 21, 2021 to an arbitrary datum.

APPENDIX D

Tables of Historical Groundwater Monitoring Data

Appendix D
Tables of Historical Groundwater 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)	Sodium (mg/L)	GW Elev (feet)
30-May-97	0.310	9.00	2.30	10.0	42.0	8.5	NT	88.88
11-Sep-97	0.571	12.60	2.00	9.37	55.0	6.05	NT	89.26
12-Mar-98	0.220	4.90	1.30	6.0	37	5.1	NT	88.92
21-Jul-98	0.143	4.29	0.84	3.92	22	7.59	NT	89.51
12-Oct-98	0.277	4.36	0.458	1.929	16	5.98	NT	87.78
21-Jan-99	0.036	1.08	0.24	1.208	6.8	2.46	NT	88.80
31-Mar-99	0.015	0.297	0.151	0.703	3.3	0.686	NT	88.28
28-Jul-99	0.087	10.80	1.96	9.38	46	3.89	NT	89.14
15-Oct-99	0.174	2.97	0.503	2.334	15	3.74	NT	88.91
10-Mar-00	0.0216	0.718	0.161	0.783	4.7	0.81	NT	88.52
21-Jun-00	0.0220	0.931	0.284	1.321	7.6	1.03	NT	89.32
21-Sep-00	0.0329	0.471	0.160	0.736	5.0	1.61	NT	89.26
25-Jan-01	0.0170	0.322	0.110	0.523	3.69	0.644	NT	88.90
19-Apr-01	0.0123	0.097	0.046	0.221	1.48	0.920	NT	88.87
24-Jul-01	0.0119	0.209	0.104	0.409	2.07	0.628	NT	89.25
28-Jan-02	0.1200	2.070	0.604	2.841	10.8	0.778	NT	89.16
30-Apr-02	5.020	9.480	0.284	3.470	32.2	2.1	NT	89.65
30-Sep-02	0.659	0.209	0.0551	0.736	3.87	1.11	NT	89.72
12-May-03	0.538	3.14	0.814	20.42	44.5	4.84	NT	89.70
09-Oct-03	0.00437	0.00571	0.00189	0.0998	0.697	U (0.32)	NT	389.08
21-Apr-04	U (0.0005)	0.000709	U (0.0005)	0.00984	U (0.05)	U (0.5)	NT	388.75
21-Oct-04	0.00544	0.00284	0.00585	1.46	3.52	2.41	NT	388.32
19-May-05	0.000943	0.00248	0.00272	0.0211	0.0709	0.48	NT	389.26
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.413)	NT	388.45
29-Apr-08	U (0.0005)	0.00088	U (0.0005)	U (0.0015)	U (0.05)	0.862	NT	388.52
12-May-09	U (0.0005)	0.00427	0.00077	0.00586	U (0.05)	1.77	NT	389.20
15-Jun-10	0.00134	0.0297	0.0357	0.249	0.849	U (0.420)	NT	389.00
24-May-11	U (0.0005)	0.00056	0.00479	0.0377	0.0857	0.652	NT	389.11
22-May-12	0.000701	0.00284	0.0765	0.407	1.41	U (0.410)	NT	388.89
21-May-13	0.000845	U (0.0005)	0.125	0.455	1.21	0.587	NT	389.20
06-May-14	U (0.0005)	U (0.0005)	0.0021	0.011	U (0.05)	0.64	NT	389.34
26-May-15	U (0.001)	0.0044	0.0045	0.031	0.21	2.3	NT	389.72
11-May-16	0.00055	0.0026	0.0053	0.029	U (0.1)	U (0.40)	NT	389.18
08-May-17	U (0.002)	U (0.002)	0.034	0.285	U (10)	1.5	NT	389.46
14-Jun-18	U (0.003)	0.0021	0.0086	0.071	0.028	0.43	NT	389.56
09-May-19	U (0.003)	U (0.002)	U (0.003)	0.0034	U (0.25)	0.42	NT	388.94
06-Oct-20	0.000373 J	0.0428	0.00419	0.0374	0.153	1.27	33	389.46
13-Oct-21	0.000246 J	0.0883	0.00310	0.0332	0.315	1.33	34.3	389.99
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Dates Well was not tested have been removed from this table.

Appendix D
Tables of Historical Groundwater 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)	Sodium (mg/L)	GW Elev (feet)
30-May-97	92	64	7.1	33	170	8.2	NT	88.86
12-Mar-98	2.8	44	13	62	420	21	NT	88.90
19-Apr-01	2.93	52.9	9.9	44.5	216	27.4	NT	88.85
24-Jul-01	1.95	30.5	5.3	33.9	136	18.5	NT	89.24
28-Jan-02	1.23	33.4	7.38	39.8	156	10.5	NT	89.14
30-Apr-02	0.116	10.2	2.60	17.43	51.4	6.9	NT	89.66
30-Sep-02	0.656	17.9	2.92	26.61	118	6.93	NT	89.29
12-May-03	0.569	19.7	4.15	25.43	90.8	5.68	NT	89.74
09-Oct-03	0.25	6.21	2.88	14.2	64.9	U (0.32)	NT	389.00
21-Apr-04	U (0.005)	0.116	0.114	1.21	5.42	7	NT	388.73
21-Oct-04	0.00518	0.0824	0.109	0.699	3.2	1.74	NT	388.03
19-May-05	0.00681	0.513	0.376	1.61	7.88	5.49	NT	389.21
26-Sep-05	0.0125	0.58	0.422	1.78	9.6	3.15	NT	388.93
15-May-06	0.00058	0.0273	0.0533	0.223	1.5	1.87	NT	388.80
07-Nov-06	0.0102	1.11	0.906	3.24	17	1.35	NT	388.64
15-May-07	0.00279	0.0199	0.0356	0.173	1.99	1.9	NT	388.15
16-Oct-07	0.0032	0.173	0.412	1.03	7.61	1.55	NT	388.15
29-Apr-08	U (0.0005)	U (0.0005)	0.0043	0.0131	0.453	2.09	NT	388.82
01-Oct-08	0.00114	0.0194	0.228	0.739	3.12	1.38	NT	389.24
12-May-09	0.00385	0.0114	0.308	0.537	4.0	8.79	NT	389.14
26-Oct-09	0.00138	0.0108	0.717	1.48	4.25	0.738	NT	388.76
15-Jun-10	0.00143	0.00135	0.0205	0.0729	1.32	0.510	NT	388.99
14-Oct-10	0.00192	0.0136	0.127	0.700	4.45	1.49	NT	388.66
24-May-11	0.00232	0.0313	0.798	1.320	6.24	3.04	NT	388.96
26-Oct-11	U (0.010)	U (0.010)	0.345	1.110	6.53	0.744	NT	388.59
22-May-12	0.00566	0.00275	0.179	0.503	5.17	NR	NT	388.88
24-Jul-12	NT	NT	NT	NT	NT	U (0.410)	NT	NM
11-Oct-12	0.000750	0.0197	0.00707	0.0614	0.687	0.655	NT	389.13
21-May-13	0.001730	0.000638	0.0190	0.0325	0.388	U (0.397)	NT	389.20
25-Sep-13	0.001300	0.00104	0.269	0.481	2.61	0.573	NT	389.27
06-May-14	0.003800	U (0.0005)	0.150	0.210	1.80	0.670	NT	389.28
17-Sep-14	0.000720	0.00068	0.096	0.150	1.30	U (0.38)	NT	388.88
26-May-15	0.0018	U (0.003)	0.092	0.21	1.6	2.5	NT	389.53
06-Oct-15	0.036	0.0039	0.290	0.640	4.7	0.76	NT	389.86
11-May-16	0.0023	U (0.001)	0.10	0.14	1.2	0.73	NT	389.13
05-Oct-16	U (0.020)	U (0.020)	0.15	0.22	1.7	1.4	NT	389.51
08-May-17	U (0.002)	U (0.002)	0.23	0.639	2.8	0.68	NT	389.42
05-Sep-17	0.0014	U (0.001)	0.041	0.081	1.000	0.9	NT	389.34
14-Jun-18	U (0.003)	U (0.002)	0.077	0.1128	1.1	0.3	NT	389.52
30-Oct-18	U (0.003)	U (0.002)	0.042	0.062	0.69	2.4	NT	389.22
09-May-19	U (0.003)	U (0.002)	0.023	0.051	0.41	0.26	NT	388.88
22-Oct-19	U (0.003)	U (0.002)	0.017	0.029	0.36	0.72	NT	389.44
18-Aug-20	0.00074	0.000886 J	0.00728	0.0156	0.203	0.632	NT	389.8
06-Oct-20	0.00121	0.000531 J	0.0104	0.0245	0.277	0.38 J	12.3	389.4
24-Jun-21	0.00062 J	0.000453 J	0.00673	0.0121	0.85	0.95	11.5	389.94
13-Oct-21	0.000702 J	U (0.001)	0.00768	0.0130	0.210	1.49	23.8	389.94
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Dates Well was not tested have been removed from this table.

Appendix D
Tables of Historical Groundwater 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)	Sodium (mg/L)	GW Elev (feet)
30-May-97	23	69	12	54	380	54	NT	88.79
30-Sep-02	36.6	75.3	3.87	40.3	337	7.38	NT	89.15
12-May-03	5.41	6.45	1.44	7.86	36.6	2.37	NT	89.68
09-Oct-03	13.6	52.3	5.31	49.9	392	U (0.32)	NT	388.92
21-Apr-04	0.617	1.47	0.722	5.69	20.2	1.9	NT	389.34
21-Oct-04	9.38	29.5	3.68	24.3	157	4.96	NT	388.26
19-May-05	0.846	5.38	1.04	8.9	37.3	2.03	NT	389.41
26-Sep-05	0.0496	1.27	0.261	4.24	14.6	3.15	NT	389.12
15-May-06	0.833	5.05	1.63	12.5	44.3	4.44	NT	388.90
07-Nov-06	1.74	26.4	3.74	31.4	174	4.68	NT	388.87
15-May-07	0.0124	0.136	0.0942	0.948	3.93	2.49	NT	388.37
16-Oct-07	0.126	2.3	0.272	17.5	55.3	7.82	NT	387.31
29-Apr-08	0.0063	0.143	0.0197	0.321	1.44	4.71	NT	388.74
01-Oct-08	0.00305	0.0238	0.0572	0.913	2.4	3.2	NT	389.36
12-May-09	0.056	0.833	0.624	5.7	17.2	5.95	NT	389.26
26-Oct-09	0.0903	2.25	0.935	13.6	51.5	3.41	NT	388.70
15-Jun-10	0.0428	0.377	0.449	4.2	12.8	2.86	NT	388.90
14-Oct-10	0.113	9.24	2.48	25.6	137	7.56	NT	388.28
24-May-11	0.205	2.53	1.31	20.9	62.4	7.72	NT	388.85
26-Oct-11	0.104	2.09	1.39	20.7	47.0	12.0	NT	388.56
22-May-12	0.131	1.99	0.751	12.9	41.3	5.22	NT	388.82
11-Oct-12	0.0102	0.373	0.271	3.83	23.2	1.35	NT	389.05
21-May-13	1.50	11.2	2.39	15.9	70.0	20.3	NT	389.13
25-Sep-13	0.102	4.01	1.93	23.9	47.9	7.15	NT	389.18
06-May-14	0.037	0.470	0.420	3.8	12.0	4.70	NT	389.10
17-Sep-14	0.047	1.5	1.200	14.0	26.0	2.70	NT	388.75
26-May-15	0.057	2.0	1.6	13.0	79.0	4.6	NT	389.50
06-Oct-15	0.10	2.1	1.5	16.0	57.0	2.2	NT	389.77
11-May-16	0.00093	0.024	0.034	0.34	1.1	1.6	NT	389.07
05-Oct-16	0.054	0.61	0.92	7.9	21	2.5	NT	389.44
08-May-17	0.021	0.32	0.63	6.6	19	4.4	NT	389.37
05-Sep-17	0.040	0.750	1.000	12.000	30.000	2.000	NT	389.25
14-Jun-18	0.027	0.67	1.1	11.6	U (25)	2.8	NT	389.44
30-Oct-18	0.036	0.37	1.2	12	39	5.7	NT	389.14
10-May-19	0.029	0.200	0.380	4.02	10	0.66	NT	388.84
22-Oct-19	0.028	0.150	0.750	5.5	17	3.7 H	NT	389.42
18-Aug-20	0.0244	0.194	0.637	6.86	12.6	2.84	28.8	389.75
06-Oct-20	0.0446	0.187	0.473	4.59	10.7	3.64	23.5	389.35
24-Jun-21	0.0292	0.278	0.598	6.45	16	2.03	25.1	389.80
13-Oct-21	0.0186 J	0.0856	0.248	1.80	7.35	2.16	31.7	389.75
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Dates Well was not tested have been removed from this table.

Appendix D
Tables of Historical Groundwater 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)	Sodium (mg/L)	GW Elev (feet)
30-May-97	0.85	0.71	0.160	0.64	3.8	0.55	NT	88.79
11-Sep-97	8.41	14.5	1.150	5.57	64	1.71	NT	89.2
12-Mar-98	2.30	3.3	0.420	1.80	15	0.68	NT	88.84
21-Jul-98	3.71	3.69	0.485	2.09	21	0.7	NT	89.41
12-Oct-98	1.95	1.99	0.360	1.58	12	1.29	NT	88.73
21-Jan-99	0.94	0.483	0.127	0.579	4.3	0.7	NT	88.75
28-Jul-99	3.48	5.6	0.390	1.86	21	2.65	NT	89.03
15-Oct-99	3.3	5.4	0.422	1.962	26	3.84	NT	88.81
10-Mar-00	1.88	2.52	0.466	2.03	14	1.91	NT	88.45
21-Jun-00	1.44	1.78	0.201	0.923	10	0.660	NT	89.24
21-Sep-00	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	0.838	NT	89.18
25-Jan-01	0.5330	0.602	0.397	1.464	7.27	1.71	NT	88.82
19-Apr-01	U (0.0005)	0.015	0.011	0.066	0.225	U(0.8)	NT	88.78
24-Jul-01	0.001	U (0.002)	U (0.002)	U (0.002)	U (0.09)	0.869	NT	89.17
28-Jan-02	0.2710	0.802	0.631	2.646	9.580	0.708	NT	89.06
30-Apr-02	0.0644	U (0.002)	0.509	0.128	0.623	U (0.495)	NT	89.66
30-Sep-02	0.0157	U (0.002)	0.00523	0.0114	0.0943	U (0.5)	NT	89.22
12-May-03	0.0138	0.00268	0.00595	0.05252	0.167	U (0.3)	NT	89.69
09-Oct-03	0.0311	U (0.0005)	0.00555	0.0657	0.266	2.95	NT	388.92
21-Apr-04	0.00295	U (0.0005)	0.00506	0.113	0.311	U (0.5)	NT	388.65
21-Oct-04	0.0121	U (0.0005)	U (0.0005)	0.00791	0.0646	0.455	NT	387.82
19-May-05	0.00295	U (0.0005)	U (0.0005)	0.0167	0.067	U (0.391)	NT	389.16
15-May-06	0.000635	U (0.0005)	U (0.0005)	0.00919	0.051	U (0.403)	NT	388.63
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	0.782	NT	387.97
29-Apr-08	0.00175	0.00338	0.00097	1.2	1.75	3.78	NT	388.88
12-May-09	U (0.0005)	0.00121	U (0.0005)	0.00189	U (0.05)	U (0.427)	NT	388.98
15-Jun-10	U (0.0005)	U (0.0005)	U (0.0005)	U (0.00976)	U (0.05)	U (0.410)	NT	388.93
24-May-11	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.403)	NT	388.87
22-May-12	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	388.82
21-May-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.403)	NT	389.13
06-May-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	NT	389.23
26-May-15	U (0.001)	U (0.001)	U (0.001)	U (0.001)	U (0.05)	0.23	NT	389.50
11-May-16	U (0.0020)	U (0.001)	U (0.001)	U (0.003)	U (0.1)	U (0.40)	NT	389.09
08-May-17	U (0.002)	U (0.002)	U (0.003)	U (0.002)	U (1)	0.14	NT	389.41
14-Jun-18	U (0.003)	U (0.002)	U (0.003)	U (0.002)	U (0.000054)	U (0.25)	NT	389.49
09-May-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	0.51	NT	393.87
06-Oct-20	U (0.001)	U (0.001)	U (0.001)	U (0.003)	0.0144	0.574	13.3	389.38
13-Oct-21	U (0.001)	U (0.001)	U (0.001)	0.000454 J	U (0.100)	2.84	19.0	389.83
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Dates Well was not tested have been removed from this table.

**Appendix D
Tables of Historical Groundwater Monitoring Data**

Monitoring Well MW-5

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
12-Oct-98	0.019	U	U	0.002	0.045	0.110	NT	85.78
21-Jan-99	0.051	U	U	U	0.110	0.127	NT	86.04
31-Mar-99	0.023	U (0.001)	U (0.001)	0.0013	U (0.09)	U (0.297)	NT	86.56
28-Jul-99	0.008	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.300)	NT	88.23
15-Oct-99	0.040	U (0.002)	U (0.002)	U (0.002)	0.11	U (0.297)	NT	88.17
10-Mar-00	0.104	0.003	U (0.002)	0.005	0.22	U (0.297)	NT	88.17
21-Jun-00	0.025	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.297)	NT	88.67
21-Sep-00	0.025	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.303)	NT	88.39
25-Jan-01	0.066	0.003	0.002	0.007	0.19	U (0.300)	NT	88.15
19-Apr-01	U(0.0005)	0.002	0.003	0.003	U (0.09)	U(0.816)	NT	88.06
24-Jul-01	U(0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.495)	NT	88.37
28-Jan-02	0.0029	U (0.002)	U (0.002)	0.002	U (0.09)	U (0.521)	NT	88.28
30-Apr-02	U(0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.500)	NT	88.85
30-Sep-02	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.5)	NT	88.00
12-May-03	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.3)	NT	87.94
09-Oct-03	U (0.0005)	U (0.0005)	U (0.0005)	U (0.001)	U (0.08)	U (0.32)	NT	388.19
21-Apr-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.5)	NT	387.86
21-Oct-04	U (0.0002)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.4)	NT	387.72
19-May-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	388.12
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	387.69
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	0.00154	U (0.05)	0.522	NT	387.46
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.435)	NT	387.92
12-May-09	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.450)	NT	388.21
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Well not tested between May 12, 2009 and October 13, 2021. Dates Well was not tested have been removed from table.

Appendix D
Tables of Historical Groundwater Monitoring Data

Monitoring Well MW-6

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
21-Jun-00	0.0012	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.3)	NT	88.51
21-Sep-00	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.297)	NT	88.47
25-Jan-01	0.00051	0.0026	U (0.002)	0.003	U (0.09)	U (0.3)	NT	88.22
19-Apr-01	U (0.0005)	U (0.002)	U (0.002)	0.003	U (0.09)	U(0.808)	NT	88.17
24-Jul-01	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.495)	NT	88.48
28-Jan-02	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.500)	NT	88.43
30-Apr-02	0.000565	0.00411	0.00203	0.01081	U (0.09)	U (0.500)	NT	88.77
30-Sep-02	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.495)	NT	88.40
12-May-03	U (0.0005)	U (0.002)	U (0.002)	U (0.002)	U (0.09)	U (0.3)	NT	88.13
09-Oct-03	U (0.0005)	U (0.0005)	U (0.0005)	U (0.001)	U (0.08)	U (0.32)	NT	388.30
21-Apr-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.5)	NT	387.99
21-Oct-04	U (0.0002)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.4)	NT	387.21
19-May-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	388.24
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.397)	NT	387.96
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	387.44
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.481)	NT	388.23
12-May-09	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.400)	NT	388.52
15-Jun-10	U (0.0005)	U (0.0005)	U (0.0005)	U (0.00976)	U (0.05)	U (0.431)	NT	NM
24-May-11	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.385)	NT	388.26
26-Oct-11	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.403)	NT	388.12
22-May-12	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	388.26
11-Oct-12	U (0.0005)	U (0.001)	U (0.001)	U (0.003)	U (0.05)	U (0.403)	NT	388.44
21-May-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	388.48
25-Sep-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.385)	NT	388.63
06-May-14	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.42)	NT	388.59
17-Sep-14	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0005)	U (0.05)	U (0.39)	NT	389.46
26-May-15	U (0.001)	U (0.001)	U (0.001)	U (0.001)	U (0.05)	U (0.21)	NT	389.20
06-Oct-15	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.01)	0.84	NT	388.99
11-May-16	U (0.0020)	U (0.0020)	U (0.0020)	U (0.0020)	U (0.0020)	U (0.0020)	NT	388.41
05-Oct-16	U (0.0020)	U (0.0020)	U (0.0030)	U (0.0020)	U (0.05)	U (0.12)	NT	388.70
08-May-17	U (0.002)	U (0.002)	U (0.003)	U (0.002)	U (1)	U (0.11)	NT	388.70
05-Sep-17	U (0.004)	U (0.001)	U (0.001)	U (0.003)	U (0.150)	U (0.290)	NT	388.64
14-Jun-18	U (0.003)	U (0.002)	U (0.003)	U (0.002)	U (0.25)	U (0.12)	NT	388.77
30-Oct-18	U (0.003)	U (0.002)	U (0.003)	0.0084	U (0.25)	U (0.12)	NT	388.53
09-May-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.12)	NT	388.30
22-Oct-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.12)	NT	388.72
18-Aug-20	U (0.200)	U (0.500)	U (0.500)	U (1.500)	U (0.0500)	J (0.210)	NT	389.05
06-Oct-20	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.0100)	U (0.800)	15	388.69
24-Jun-21	U (0.001)	U (0.001)	U (0.001)	U (0.003)	J 0.0384	U (0.800)	9.09	388.96
13-Oct-21	U (0.001)	U (0.001)	U (0.001)	0.000221	U (0.1)	0.376 J	14.2	389.12
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Dates Well was not tested have been removed from this table.

**Appendix D
Tables of Historical Groundwater Monitoring Data**

Monitoring Well MW-7

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
09-Oct-03	0.0237	0.00185	0.014	0.0877	2.36	U (0.32)	NT	389.10
21-Apr-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.5)	NT	388.83
21-Oct-04	0.00325	U (0.0005)	0.000934	0.00498	0.298	0.508	NT	388.25
19-May-05	0.000909	U (0.0005)	0.000527	U (0.0015)	0.275	U (0.391)	NT	389.29
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	0.109	0.412	NT	388.70
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.413)	NT	388.88
12-May-09	U (0.0005)	U (0.0005)	0.00063	0.00231	1.16	U (0.442)	NT	389.18
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Well not tested between May 12, 2009 and October 13, 2021.

Monitoring Well MW-8

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
16-Mar-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.37)	NT	388.69
21-Apr-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.5)	NT	388.79
21-Oct-04	0.000298	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.4)	NT	388.30
19-May-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	389.26
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	NT	388.73
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.394)	NT	388.41
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	388.87
12-May-09	U (0.0005)	0.00062	0.00067	0.00199	U (0.05)	U (0.413)	NT	389.22
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Well not tested between May 12, 2009 and October 13, 2021.

Appendix D
Tables of Historical Groundwater Monitoring Data

Monitoring Well MW-9

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
16-Mar-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.37)	NT	388.27
21-Apr-04	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.5)	NT	388.88
21-Oct-04	U (0.0002)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	U (0.4)	NT	388.22
19-May-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	389.41
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	388.83
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	NT	388.33
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.417)	NT	388.94
12-May-09	U (0.0005)	U (0.0005)	U (0.0005)	0.00182	U (0.05)	U (0.400)	NT	389.33
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Well not tested between May 12, 2009 and October 13, 2021.

Appendix D
Tables of Historical Groundwater Monitoring Data

Monitoring Well MW-10

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
17-Sep-04	0.0103	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.385)	NT	NM
21-Oct-04	U (0.0002)	U (0.0005)	U (0.0005)	U (0.001)	U (0.05)	2.19	NT	387.01
19-May-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	387.92
26-Sep-05	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.397)	NT	387.87
15-May-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.391)	NT	387.69
07-Nov-06	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.442)	NT	387.72
15-May-07	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	NT	387.31
16-Oct-07	U (0.0005)	0.000745	U (0.0005)	0.00843	U (0.05)	U (0.427)	NT	387.31
29-Apr-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.424)	NT	387.79
01-Oct-08	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.49)	NT	388.12
12-May-09	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.403)	NT	388.04
26-Oct-09	U (0.0005)	U (0.001)	U (0.001)	U (0.003)	U (0.05)	U (0.417)	NT	387.77
15-Jun-10	U (0.0005)	U (0.0005)	U (0.0005)	U (0.00976)	U (0.05)	U (0.417)	NT	387.95
14-Oct-10	U (0.0005)	U (0.001)	U (0.001)	U (0.003)	U (0.05)	U (0.397)	NT	387.82
24-May-11	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.410)	NT	387.92
26-Oct-11	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.410)	NT	387.79
22-May-12	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.410)	NT	387.87
11-Oct-12	U (0.0005)	U (0.001)	U (0.001)	U (0.003)	U (0.05)	U (0.413)	NT	388.03
21-May-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.410)	NT	388.09
25-Sep-13	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.403)	NT	388.21
06-May-14	U (0.0005)	U (0.0005)	U (0.0005)	0.0027	U (0.05)	U (0.41)	NT	388.19
17-Sep-14	U (0.0005)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.05)	U (0.41)	NT	389.21
26-May-15	U (0.001)	U (0.001)	U (0.001)	U (0.001)	U (0.05)	U (0.22)	NT	388.95
06-Oct-15	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.1)	0.41	NT	388.59
11-May-16	U (0.0020)	U (0.001)	U (0.001)	U (0.003)	U (0.1)	U (0.42)	NT	388.07
05-Oct-16	U (0.0020)	U (0.002)	U (0.003)	U (0.002)	U (0.05)	2.6	NT	388.42
08-May-17	U (0.002)	U (0.002)	U (0.003)	0.0056	U (1)	U (0.11)	NT	388.32
05-Sep-17	U (.0004)	U (0.001)	U (0.001)	U (0.003)	U (0.150)	U (0.280)	NT	388.28
14-Jun-18	U (0.003)	U (0.002)	U (0.003)	U (0.002)	U (0.25)	U (0.12)	NT	388.37
30-Oct-18	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.12)	NT	388.19
09-May-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.12)	NT	388.01
22-Oct-19	U (0.003)	U (0.002)	U (0.003)	U (0.003)	U (0.25)	U (0.12)	NT	388.37
18-Aug-20	U (0.0002)	U (0.0005)	U (0.0005)	U (0.0015)	U (0.050)	J (0.283)	NT	388.65
06-Oct-20	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.0100)	U (0.800)	5.51	388.32
24-Jun-21	U (0.001)	U (0.001)	U (0.001)	U (0.003)	U (0.0100)	U (0.800)	6.11	388.54
13-Oct-21	0.00247	U (0.001)	U (0.001)	U (0.003)	U (0.1)	0.403 J	6.56	388.78
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Appendix D
Tables of Historical Groundwater Monitoring Data

Monitoring Well 17-2

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
30-Oct-18	U (0.003)	U (0.002)	0.18	0.9	3.9	2.5	NT	NM
10-May-19	U (0.003)	U (0.002)	0.0051	0.012	U (0.25)	0.91	NT	NM
22-Oct-19	U (0.003)	U (0.002)	0.210	0.790	3.5	1.4 H	NT	NM
18-Aug-20	0.0017 J	0.00186 J	0.084	0.320	1.76	1.96	41.6	389.83
06-Oct-20	0.00132 J	U (0.001)	0.1130	0.591	2.08	2.43	75.8	389.41
24-Jun-21	0.00163 J	U (0.01)	0.0727	0.173	1.36	1.58	94.6	389.88
13-Oct-21	0.00125 J	0.00253 J	0.0506	0.197	1.51	1.77	157	389.86
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Monitoring Well 17-5

Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)	Sodium (mg/L)	GW Elev (feet)
14-Jun-18	0.025	0.52	0.064	0.548	1.7	0.17	NT	NM
30-Oct-18	0.055	0.21	0.15	0.505	3.7	0.26	NT	NM
09-May-19	0.0032	0.0026	0.016	0.048	0.31	0.92	NT	NM
22-Oct-19	0.022	0.360	0.230	0.721	3.7	0.47 H	NT	NM
18-Aug-20	0.0308	0.386	0.151	0.896	2.68	0.825	12.4	389.82
06-Oct-20	0.0314	0.144	0.158	0.401	1.68	J 0.569	14.1	389.43
24-Jun-21	NT	NT	NT	NT	NT	NT	NM	NM
13-Oct-21	0.0387	0.265	0.140	0.469	2.18	0.800 J	26.0	388.85
GCLs	0.0046	1.1	0.015	0.19	2.2	1.5	NA	NA

Monitoring Well 17-2 Supplemental

Date	1,2,4-TMB (mg/L)	1,3,5-TMB (mg/L)	Naphthalene (mg/L)
19-Jul-17	NT	NT	U(0.039)
	NT	NT	NT
10-May-19	NT	NT	U(0.00011)
18-Aug-20	0.457	0.088	0.00805
06-Oct-20	NT	NT	0.00614
24-Jun-21	0.389	0.0569	0.0164 B,J
13-Oct-21	0.315	0.0692	0.00493
GCLs	0.056	0.06	0.0017

Monitoring Well 17-5 Supplemental

Date	1,2,4-TMB (mg/L)	1,3,5-TMB (mg/L)	Naphthalene (mg/L)
19-Jul-17	0.86	NT	0.027
14-Jun-18	0.044	0.063	0.0011
10-May-19	NT	NT	0.00014
18-Aug-20	0.19	0.117	0.00729
06-Oct-20	NT	NT	0.00475
24-Jun-21	NT	NT	NT
13-Oct-21	0.186	0.0964	0.00210
GCLs	0.056	0.06	0.0017

Appendix D
Tables of Historical Groundwater Monitoring Data

Key:

DRO - diesel range organics

GCL - ground water cleanup levels

GRO - gasoline range organics

GW Elev - ground water elevation

J - The identification of the analyte is acceptable; the reported value is an estimate.

H - Sample was prepped or analyzed beyond the specified holding time

mg/L - milligrams per liter

NA - not applicable

NM - not measured

NR - Reported as an unreliable result by the laboratory.

NT - not tested

U - Undetected above practical quantitation limits.

Analytical data for the June 2010 Monitoring Event may have an associated low bias for some samples.
See ADEC laboratory QC checklist for impacted analytes.

Bold, shade indicates concentration exceeds the GCL.

APPENDIX E

*Laboratory Analytical Report and ADEC
Laboratory Data Review Checklist*

November 18, 2021

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

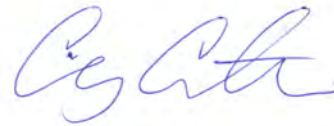
8 Al

9 Sc

Stantec - Anchorage, AK - Speedway

Sample Delivery Group: L1418546
Samples Received: 10/15/2021
Project Number:
Description: Speedway 5310 TNS 112
Site: 0005315
Report To: Ms. Leslie Petre
725 E Fireweed Lane
Suite 200
Anchorage, AK 99503

Entire Report Reviewed By:



Craig Cothron
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

ACCOUNT:

Stantec - Anchorage, AK - Speedway

PROJECT:

SDG:

L1418546

DATE/TIME:

11/18/21 08:24

PAGE:

1 of 34

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

SAMPLE SUMMARY

MW-02 L1418546-01 GW

Collected by
LP/GM Collected date/time
10/13/21 14:25 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 13:44	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 17:19	10/22/21 17:19	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	1	10/24/21 04:55	10/24/21 04:55	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 16:07	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 15:13	ADF	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

MW-03 L1418546-02 GW

Collected by
LP/GM Collected date/time
10/13/21 14:55 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 13:46	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	20	10/22/21 21:20	10/22/21 21:20	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	50	10/24/21 08:08	10/24/21 08:08	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 16:27	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 15:32	ADF	Mt. Juliet, TN

MW-06 L1418546-03 GW

Collected by
LP/GM Collected date/time
10/13/21 10:38 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 13:49	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 17:41	10/22/21 17:41	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	1	10/24/21 05:17	10/24/21 05:17	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 16:47	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	1	10/20/21 08:05	10/20/21 15:52	ADF	Mt. Juliet, TN

MW-10 L1418546-04 GW

Collected by
LP/GM Collected date/time
10/13/21 11:05 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 13:52	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 18:03	10/22/21 18:03	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	1	10/24/21 05:38	10/24/21 05:38	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 17:07	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	1	10/20/21 08:05	10/20/21 16:12	ADF	Mt. Juliet, TN

MW17-02 L1418546-05 GW

Collected by
LP/GM Collected date/time
10/13/21 13:05 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 14:00	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	5	10/22/21 20:58	10/22/21 20:58	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	5	10/24/21 07:25	10/24/21 07:25	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 17:27	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 16:32	ADF	Mt. Juliet, TN

SAMPLE SUMMARY

MW17-05 L1418546-06 GW

Collected by
LP/GM Collected date/time
10/13/21 13:45 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 14:02	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 18:25	10/22/21 18:25	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	20	10/24/21 07:47	10/24/21 07:47	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 17:47	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 16:52	ADF	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

MW-01 L1418546-07 GW

Collected by
LP/GM Collected date/time
10/13/21 12:40 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 14:05	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 18:47	10/22/21 18:47	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762339	1	10/24/21 05:59	10/24/21 05:59	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 18:07	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	3	10/20/21 08:05	10/20/21 17:12	ADF	Mt. Juliet, TN

MW-04 L1418546-08 GW

Collected by
LP/GM Collected date/time
10/13/21 12:00 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 14:08	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 19:09	10/22/21 19:09	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762372	1	10/23/21 23:19	10/23/21 23:19	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 18:27	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 17:32	ADF	Mt. Juliet, TN

DUPLICATE L1418546-09 GW

Collected by
LP/GM Collected date/time
10/13/21 13:05 Received date/time
10/15/21 14:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010C	WG1765498	1	11/02/21 04:04	11/02/21 14:11	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method AK101	WG1761611	1	10/22/21 19:31	10/22/21 19:31	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1762372	1	10/23/21 23:38	10/23/21 23:38	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1764465	10	10/27/21 14:57	10/27/21 14:57	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1762546	1.05	10/26/21 09:18	10/27/21 18:48	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1759447	2	10/20/21 08:05	10/20/21 17:52	ADF	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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	23.8		0.504	3.00	1	11/02/2021 13:44	WG1765498

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

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	0.210		0.0287	0.100	1	10/22/2021 17:19	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	97.5			50.0-150		10/22/2021 17:19	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	97.9			79.0-125		10/22/2021 17:19	WG1761611

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	0.000702	J	0.0000941	0.00100	1	10/24/2021 04:55	WG1762339
n-Butylbenzene	0.000225	J	0.000157	0.00100	1	10/24/2021 04:55	WG1762339
sec-Butylbenzene	0.000571	J	0.000125	0.00100	1	10/24/2021 04:55	WG1762339
tert-Butylbenzene	U		0.000127	0.00100	1	10/24/2021 04:55	WG1762339
Ethylbenzene	0.00768		0.000137	0.00100	1	10/24/2021 04:55	WG1762339
Isopropylbenzene	0.00279		0.000105	0.00100	1	10/24/2021 04:55	WG1762339
Naphthalene	0.00129	J	0.00100	0.00500	1	10/24/2021 04:55	WG1762339
Toluene	U		0.000278	0.00100	1	10/24/2021 04:55	WG1762339
1,2,4-Trimethylbenzene	0.0174		0.000322	0.00100	1	10/24/2021 04:55	WG1762339
1,3,5-Trimethylbenzene	0.00796		0.000104	0.00100	1	10/24/2021 04:55	WG1762339
Total Xylenes	0.0130		0.000174	0.00300	1	10/24/2021 04:55	WG1762339
(S) Toluene-d8	101			80.0-120		10/24/2021 04:55	WG1762339
(S) 4-Bromofluorobenzene	98.7			77.0-126		10/24/2021 04:55	WG1762339
(S) 1,2-Dichloroethane-d4	114			70.0-130		10/24/2021 04:55	WG1762339

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	1.49		0.240	0.840	1.05	10/27/2021 16:07	WG1762546
(S) o-Terphenyl	78.9			50.0-150		10/27/2021 16:07	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 15:13	WG1759447
Acenaphthene	U		0.0000380	0.000100	2	10/20/2021 15:13	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 15:13	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 15:13	WG1759447
Benzo(a)pyrene	0.0000690	J	0.0000368	0.000100	2	10/20/2021 15:13	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 15:13	WG1759447
Benzo(g,h,i)perylene	0.000243		0.0000368	0.000100	2	10/20/2021 15:13	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 15:13	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 15:13	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 15:13	WG1759447
Fluoranthene	0.0000910	J	0.0000540	0.000200	2	10/20/2021 15:13	WG1759447
Fluorene	U		0.0000338	0.000100	2	10/20/2021 15:13	WG1759447
Indeno(1,2,3-cd)pyrene	0.000158		0.0000316	0.000100	2	10/20/2021 15:13	WG1759447
Naphthalene	U		0.000183	0.000500	2	10/20/2021 15:13	WG1759447
Phenanthrene	0.0000548	J	0.0000360	0.000100	2	10/20/2021 15:13	WG1759447
Pyrene	0.000170		0.0000338	0.000100	2	10/20/2021 15:13	WG1759447
1-Methylnaphthalene	U		0.000137	0.000500	2	10/20/2021 15:13	WG1759447

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	U		0.000135	0.000500	2	10/20/2021 15:13	WG1759447
(S) Nitrobenzene-d5	90.5			31.0-160		10/20/2021 15:13	WG1759447
(S) 2-Fluorobiphenyl	92.6			48.0-148		10/20/2021 15:13	WG1759447
(S) p-Terphenyl-d14	93.7			37.0-146		10/20/2021 15:13	WG1759447

Sample Narrative:

L1418546-01 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	31.7		0.504	3.00	1	11/02/2021 13:46	WG1765498

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	7.35		0.574	2.00	20	10/22/2021 21:20	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	98.6			50.0-150		10/22/2021 21:20	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	98.3			79.0-125		10/22/2021 21:20	WG1761611

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

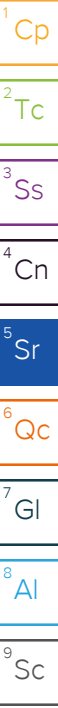
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	0.0186	J	0.00471	0.0500	50	10/24/2021 08:08	WG1762339
n-Butylbenzene	U		0.00785	0.0500	50	10/24/2021 08:08	WG1762339
sec-Butylbenzene	0.00991	J	0.00625	0.0500	50	10/24/2021 08:08	WG1762339
tert-Butylbenzene	U		0.00635	0.0500	50	10/24/2021 08:08	WG1762339
Ethylbenzene	0.248		0.00685	0.0500	50	10/24/2021 08:08	WG1762339
Isopropylbenzene	0.0329	J	0.00525	0.0500	50	10/24/2021 08:08	WG1762339
Naphthalene	U		0.0500	0.250	50	10/24/2021 08:08	WG1762339
Toluene	0.0856		0.0139	0.0500	50	10/24/2021 08:08	WG1762339
1,2,4-Trimethylbenzene	0.639		0.0161	0.0500	50	10/24/2021 08:08	WG1762339
1,3,5-Trimethylbenzene	0.204		0.00520	0.0500	50	10/24/2021 08:08	WG1762339
Total Xylenes	1.80		0.00870	0.150	50	10/24/2021 08:08	WG1762339
(S) Toluene-d8	96.9			80.0-120		10/24/2021 08:08	WG1762339
(S) 4-Bromofluorobenzene	95.1			77.0-126		10/24/2021 08:08	WG1762339
(S) 1,2-Dichloroethane-d4	116			70.0-130		10/24/2021 08:08	WG1762339

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	2.16		0.240	0.840	1.05	10/27/2021 16:27	WG1762546
(S) o-Terphenyl	106			50.0-150		10/27/2021 16:27	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 15:32	WG1759447
Acenaphthene	0.000113		0.0000380	0.000100	2	10/20/2021 15:32	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 15:32	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 15:32	WG1759447
Benzo(a)pyrene	U		0.0000368	0.000100	2	10/20/2021 15:32	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 15:32	WG1759447
Benzo(g,h,i)perylene	U		0.0000368	0.000100	2	10/20/2021 15:32	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 15:32	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 15:32	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 15:32	WG1759447
Fluoranthene	U		0.0000540	0.000200	2	10/20/2021 15:32	WG1759447
Fluorene	0.000251		0.0000338	0.000100	2	10/20/2021 15:32	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000316	0.000100	2	10/20/2021 15:32	WG1759447
Naphthalene	0.0112		0.000183	0.000500	2	10/20/2021 15:32	WG1759447
Phenanthrene	0.000109		0.0000360	0.000100	2	10/20/2021 15:32	WG1759447
Pyrene	0.0000443	J	0.0000338	0.000100	2	10/20/2021 15:32	WG1759447
1-Methylnaphthalene	0.00190		0.000137	0.000500	2	10/20/2021 15:32	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	0.00207		0.000135	0.000500	2	10/20/2021 15:32	WG1759447
(S) Nitrobenzene-d5	89.5			31.0-160		10/20/2021 15:32	WG1759447
(S) 2-Fluorobiphenyl	88.9			48.0-148		10/20/2021 15:32	WG1759447
(S) p-Terphenyl-d14	98.4			37.0-146		10/20/2021 15:32	WG1759447

Sample Narrative:

L1418546-02 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	14.2		0.504	3.00	1	11/02/2021 13:49	WG1765498

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	10/22/2021 17:41	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	97.7			50.0-150		10/22/2021 17:41	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	97.6			79.0-125		10/22/2021 17:41	WG1761611

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

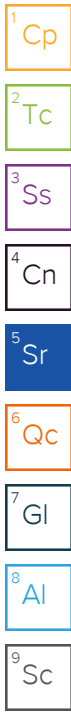
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	10/24/2021 05:17	WG1762339
n-Butylbenzene	U		0.000157	0.00100	1	10/24/2021 05:17	WG1762339
sec-Butylbenzene	U		0.000125	0.00100	1	10/24/2021 05:17	WG1762339
tert-Butylbenzene	U		0.000127	0.00100	1	10/24/2021 05:17	WG1762339
Ethylbenzene	U		0.000137	0.00100	1	10/24/2021 05:17	WG1762339
Isopropylbenzene	U		0.000105	0.00100	1	10/24/2021 05:17	WG1762339
Naphthalene	U		0.00100	0.00500	1	10/24/2021 05:17	WG1762339
Toluene	U		0.000278	0.00100	1	10/24/2021 05:17	WG1762339
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/24/2021 05:17	WG1762339
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/24/2021 05:17	WG1762339
Total Xylenes	0.000221	J	0.000174	0.00300	1	10/24/2021 05:17	WG1762339
(S) Toluene-d8	104			80.0-120		10/24/2021 05:17	WG1762339
(S) 4-Bromofluorobenzene	99.4			77.0-126		10/24/2021 05:17	WG1762339
(S) 1,2-Dichloroethane-d4	115			70.0-130		10/24/2021 05:17	WG1762339

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	0.376	J	0.240	0.840	1.05	10/27/2021 16:47	WG1762546
(S) o-Terphenyl	85.3			50.0-150		10/27/2021 16:47	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000190	0.0000500	1	10/20/2021 15:52	WG1759447
Acenaphthene	U		0.0000190	0.0000500	1	10/20/2021 15:52	WG1759447
Acenaphthylene	U		0.0000171	0.0000500	1	10/20/2021 15:52	WG1759447
Benzo(a)anthracene	U		0.0000203	0.0000500	1	10/20/2021 15:52	WG1759447
Benzo(a)pyrene	U		0.0000184	0.0000500	1	10/20/2021 15:52	WG1759447
Benzo(b)fluoranthene	U		0.0000168	0.0000500	1	10/20/2021 15:52	WG1759447
Benzo(g,h,i)perylene	U		0.0000184	0.0000500	1	10/20/2021 15:52	WG1759447
Benzo(k)fluoranthene	U		0.0000202	0.0000500	1	10/20/2021 15:52	WG1759447
Chrysene	U		0.0000179	0.0000500	1	10/20/2021 15:52	WG1759447
Dibenz(a,h)anthracene	U		0.0000160	0.0000500	1	10/20/2021 15:52	WG1759447
Fluoranthene	U		0.0000270	0.000100	1	10/20/2021 15:52	WG1759447
Fluorene	U		0.0000169	0.0000500	1	10/20/2021 15:52	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000158	0.0000500	1	10/20/2021 15:52	WG1759447
Naphthalene	U		0.0000917	0.000250	1	10/20/2021 15:52	WG1759447
Phenanthrene	U		0.0000180	0.0000500	1	10/20/2021 15:52	WG1759447
Pyrene	U		0.0000169	0.0000500	1	10/20/2021 15:52	WG1759447
1-Methylnaphthalene	U		0.0000687	0.000250	1	10/20/2021 15:52	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	U		0.0000674	0.000250	1	10/20/2021 15:52	WG1759447
(S) Nitrobenzene-d5	98.4			31.0-160		10/20/2021 15:52	WG1759447
(S) 2-Fluorobiphenyl	98.4			48.0-148		10/20/2021 15:52	WG1759447
(S) p-Terphenyl-d14	112			37.0-146		10/20/2021 15:52	WG1759447

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	6.56		0.504	3.00	1	11/02/2021 13:52	WG1765498

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	10/22/2021 18:03	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	96.1			50.0-150		10/22/2021 18:03	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	98.8			79.0-125		10/22/2021 18:03	WG1761611

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	0.00247		0.0000941	0.00100	1	10/24/2021 05:38	WG1762339
n-Butylbenzene	U		0.000157	0.00100	1	10/24/2021 05:38	WG1762339
sec-Butylbenzene	U		0.000125	0.00100	1	10/24/2021 05:38	WG1762339
tert-Butylbenzene	U		0.000127	0.00100	1	10/24/2021 05:38	WG1762339
Ethylbenzene	U		0.000137	0.00100	1	10/24/2021 05:38	WG1762339
Isopropylbenzene	U		0.000105	0.00100	1	10/24/2021 05:38	WG1762339
Naphthalene	U		0.00100	0.00500	1	10/24/2021 05:38	WG1762339
Toluene	U		0.000278	0.00100	1	10/24/2021 05:38	WG1762339
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/24/2021 05:38	WG1762339
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/24/2021 05:38	WG1762339
Total Xylenes	U		0.000174	0.00300	1	10/24/2021 05:38	WG1762339
(S) Toluene-d8	103			80.0-120		10/24/2021 05:38	WG1762339
(S) 4-Bromofluorobenzene	99.2			77.0-126		10/24/2021 05:38	WG1762339
(S) 1,2-Dichloroethane-d4	112			70.0-130		10/24/2021 05:38	WG1762339

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	0.403	J	0.240	0.840	1.05	10/27/2021 17:07	WG1762546
(S) o-Terphenyl	89.1			50.0-150		10/27/2021 17:07	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000190	0.0000500	1	10/20/2021 16:12	WG1759447
Acenaphthene	U		0.0000190	0.0000500	1	10/20/2021 16:12	WG1759447
Acenaphthylene	U		0.0000171	0.0000500	1	10/20/2021 16:12	WG1759447
Benzo(a)anthracene	U		0.0000203	0.0000500	1	10/20/2021 16:12	WG1759447
Benzo(a)pyrene	U		0.0000184	0.0000500	1	10/20/2021 16:12	WG1759447
Benzo(b)fluoranthene	U		0.0000168	0.0000500	1	10/20/2021 16:12	WG1759447
Benzo(g,h,i)perylene	U		0.0000184	0.0000500	1	10/20/2021 16:12	WG1759447
Benzo(k)fluoranthene	U		0.0000202	0.0000500	1	10/20/2021 16:12	WG1759447
Chrysene	U		0.0000179	0.0000500	1	10/20/2021 16:12	WG1759447
Dibenz(a,h)anthracene	U		0.0000160	0.0000500	1	10/20/2021 16:12	WG1759447
Fluoranthene	U		0.0000270	0.000100	1	10/20/2021 16:12	WG1759447
Fluorene	U		0.0000169	0.0000500	1	10/20/2021 16:12	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000158	0.0000500	1	10/20/2021 16:12	WG1759447
Naphthalene	U		0.0000917	0.000250	1	10/20/2021 16:12	WG1759447
Phenanthrene	U		0.0000180	0.0000500	1	10/20/2021 16:12	WG1759447
Pyrene	U		0.0000169	0.0000500	1	10/20/2021 16:12	WG1759447
1-Methylnaphthalene	U		0.0000687	0.000250	1	10/20/2021 16:12	WG1759447

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	U		0.0000674	0.000250	1	10/20/2021 16:12	WG1759447
(S) Nitrobenzene-d5	96.3			31.0-160		10/20/2021 16:12	WG1759447
(S) 2-Fluorobiphenyl	97.9			48.0-148		10/20/2021 16:12	WG1759447
(S) p-Terphenyl-d14	113			37.0-146		10/20/2021 16:12	WG1759447

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	157		0.504	3.00	1	11/02/2021 14:00	WG1765498

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	1.51		0.143	0.500	5	10/22/2021 20:58	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	99.4			50.0-150		10/22/2021 20:58	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	98.4			79.0-125		10/22/2021 20:58	WG1761611

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

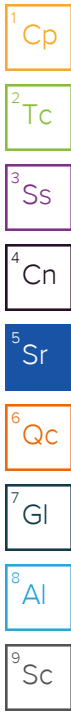
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	0.00125	J	0.000471	0.00500	5	10/24/2021 07:25	WG1762339
n-Butylbenzene	0.00219	J	0.000785	0.00500	5	10/24/2021 07:25	WG1762339
sec-Butylbenzene	0.00314	J	0.000625	0.00500	5	10/24/2021 07:25	WG1762339
tert-Butylbenzene	U		0.000635	0.00500	5	10/24/2021 07:25	WG1762339
Ethylbenzene	0.0506		0.000685	0.00500	5	10/24/2021 07:25	WG1762339
Isopropylbenzene	0.0116		0.000525	0.00500	5	10/24/2021 07:25	WG1762339
Naphthalene	0.00620	J	0.00500	0.0250	5	10/24/2021 07:25	WG1762339
Toluene	0.00253	J	0.00139	0.00500	5	10/24/2021 07:25	WG1762339
1,2,4-Trimethylbenzene	0.315		0.00161	0.00500	5	10/24/2021 07:25	WG1762339
1,3,5-Trimethylbenzene	0.0692		0.000520	0.00500	5	10/24/2021 07:25	WG1762339
Total Xylenes	0.197		0.000870	0.0150	5	10/24/2021 07:25	WG1762339
(S) Toluene-d8	99.9			80.0-120		10/24/2021 07:25	WG1762339
(S) 4-Bromofluorobenzene	102			77.0-126		10/24/2021 07:25	WG1762339
(S) 1,2-Dichloroethane-d4	113			70.0-130		10/24/2021 07:25	WG1762339

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	1.77		0.240	0.840	1.05	10/27/2021 17:27	WG1762546
(S) o-Terphenyl	96.7			50.0-150		10/27/2021 17:27	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 16:32	WG1759447
Acenaphthene	0.000131		0.0000380	0.000100	2	10/20/2021 16:32	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 16:32	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 16:32	WG1759447
Benzo(a)pyrene	U		0.0000368	0.000100	2	10/20/2021 16:32	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 16:32	WG1759447
Benzo(g,h,i)perylene	U		0.0000368	0.000100	2	10/20/2021 16:32	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 16:32	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 16:32	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 16:32	WG1759447
Fluoranthene	U		0.0000540	0.000200	2	10/20/2021 16:32	WG1759447
Fluorene	0.000165		0.0000338	0.000100	2	10/20/2021 16:32	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000316	0.000100	2	10/20/2021 16:32	WG1759447
Naphthalene	0.00493		0.000183	0.000500	2	10/20/2021 16:32	WG1759447
Phenanthrene	0.0000724	J	0.0000360	0.000100	2	10/20/2021 16:32	WG1759447
Pyrene	U		0.0000338	0.000100	2	10/20/2021 16:32	WG1759447
1-Methylnaphthalene	0.00179		0.000137	0.000500	2	10/20/2021 16:32	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	0.00220		0.000135	0.000500	2	10/20/2021 16:32	WG1759447
(S) Nitrobenzene-d5	98.9			31.0-160		10/20/2021 16:32	WG1759447
(S) 2-Fluorobiphenyl	93.2			48.0-148		10/20/2021 16:32	WG1759447
(S) p-Terphenyl-d14	106			37.0-146		10/20/2021 16:32	WG1759447

Sample Narrative:

L1418546-05 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	26.0		0.504	3.00	1	11/02/2021 14:02	WG1765498

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	2.18		0.0287	0.100	1	10/22/2021 18:25	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	97.8			50.0-150		10/22/2021 18:25	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	99.4			79.0-125		10/22/2021 18:25	WG1761611

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	0.0387		0.00188	0.0200	20	10/24/2021 07:47	WG1762339
n-Butylbenzene	U		0.00314	0.0200	20	10/24/2021 07:47	WG1762339
sec-Butylbenzene	U		0.00250	0.0200	20	10/24/2021 07:47	WG1762339
tert-Butylbenzene	U		0.00254	0.0200	20	10/24/2021 07:47	WG1762339
Ethylbenzene	0.140		0.00274	0.0200	20	10/24/2021 07:47	WG1762339
Isopropylbenzene	0.0158	J	0.00210	0.0200	20	10/24/2021 07:47	WG1762339
Naphthalene	U		0.0200	0.100	20	10/24/2021 07:47	WG1762339
Toluene	0.265		0.00556	0.0200	20	10/24/2021 07:47	WG1762339
1,2,4-Trimethylbenzene	0.186		0.00644	0.0200	20	10/24/2021 07:47	WG1762339
1,3,5-Trimethylbenzene	0.0964		0.00208	0.0200	20	10/24/2021 07:47	WG1762339
Total Xylenes	0.469		0.00348	0.0600	20	10/24/2021 07:47	WG1762339
(S) Toluene-d8	99.8			80.0-120		10/24/2021 07:47	WG1762339
(S) 4-Bromofluorobenzene	98.2			77.0-126		10/24/2021 07:47	WG1762339
(S) 1,2-Dichloroethane-d4	111			70.0-130		10/24/2021 07:47	WG1762339

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	0.800	J	0.240	0.840	1.05	10/27/2021 17:47	WG1762546
(S) o-Terphenyl	98.5			50.0-150		10/27/2021 17:47	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 16:52	WG1759447
Acenaphthene	0.0000460	J	0.0000380	0.000100	2	10/20/2021 16:52	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 16:52	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 16:52	WG1759447
Benzo(a)pyrene	U		0.0000368	0.000100	2	10/20/2021 16:52	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 16:52	WG1759447
Benzo(g,h,i)perylene	U		0.0000368	0.000100	2	10/20/2021 16:52	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 16:52	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 16:52	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 16:52	WG1759447
Fluoranthene	U		0.0000540	0.000200	2	10/20/2021 16:52	WG1759447
Fluorene	0.0000511	J	0.0000338	0.000100	2	10/20/2021 16:52	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000316	0.000100	2	10/20/2021 16:52	WG1759447
Naphthalene	0.00210		0.000183	0.000500	2	10/20/2021 16:52	WG1759447
Phenanthrene	U		0.0000360	0.000100	2	10/20/2021 16:52	WG1759447
Pyrene	U		0.0000338	0.000100	2	10/20/2021 16:52	WG1759447
1-Methylnaphthalene	0.000713		0.000137	0.000500	2	10/20/2021 16:52	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	0.000797		0.000135	0.000500	2	10/20/2021 16:52	WG1759447
(S) Nitrobenzene-d5	83.2			31.0-160		10/20/2021 16:52	WG1759447
(S) 2-Fluorobiphenyl	92.6			48.0-148		10/20/2021 16:52	WG1759447
(S) p-Terphenyl-d14	106			37.0-146		10/20/2021 16:52	WG1759447

Sample Narrative:

L1418546-06 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	34.3		0.504	3.00	1	11/02/2021 14:05	WG1765498

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	0.315		0.0287	0.100	1	10/22/2021 18:47	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	98.2			50.0-150		10/22/2021 18:47	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	98.1			79.0-125		10/22/2021 18:47	WG1761611

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

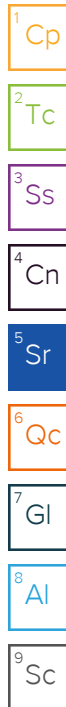
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	0.000246	J	0.0000941	0.00100	1	10/24/2021 05:59	WG1762339
n-Butylbenzene	U		0.000157	0.00100	1	10/24/2021 05:59	WG1762339
sec-Butylbenzene	U		0.000125	0.00100	1	10/24/2021 05:59	WG1762339
tert-Butylbenzene	U		0.000127	0.00100	1	10/24/2021 05:59	WG1762339
Ethylbenzene	0.00310		0.000137	0.00100	1	10/24/2021 05:59	WG1762339
Isopropylbenzene	0.000460	J	0.000105	0.00100	1	10/24/2021 05:59	WG1762339
Naphthalene	U		0.00100	0.00500	1	10/24/2021 05:59	WG1762339
Toluene	0.0883		0.000278	0.00100	1	10/24/2021 05:59	WG1762339
1,2,4-Trimethylbenzene	0.00700		0.000322	0.00100	1	10/24/2021 05:59	WG1762339
1,3,5-Trimethylbenzene	0.00152		0.000104	0.00100	1	10/24/2021 05:59	WG1762339
Total Xylenes	0.0332		0.000174	0.00300	1	10/24/2021 05:59	WG1762339
(S) Toluene-d8	103			80.0-120		10/24/2021 05:59	WG1762339
(S) 4-Bromofluorobenzene	100			77.0-126		10/24/2021 05:59	WG1762339
(S) 1,2-Dichloroethane-d4	113			70.0-130		10/24/2021 05:59	WG1762339

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	1.33		0.240	0.840	1.05	10/27/2021 18:07	WG1762546
(S) o-Terphenyl	93.8			50.0-150		10/27/2021 18:07	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000570	0.000150	3	10/20/2021 17:12	WG1759447
Acenaphthene	U		0.0000570	0.000150	3	10/20/2021 17:12	WG1759447
Acenaphthylene	U		0.0000513	0.000150	3	10/20/2021 17:12	WG1759447
Benzo(a)anthracene	U		0.0000609	0.000150	3	10/20/2021 17:12	WG1759447
Benzo(a)pyrene	U		0.0000552	0.000150	3	10/20/2021 17:12	WG1759447
Benzo(b)fluoranthene	U		0.0000504	0.000150	3	10/20/2021 17:12	WG1759447
Benzo(g,h,i)perylene	0.0000570	J	0.0000552	0.000150	3	10/20/2021 17:12	WG1759447
Benzo(k)fluoranthene	U		0.0000606	0.000150	3	10/20/2021 17:12	WG1759447
Chrysene	U		0.0000537	0.000150	3	10/20/2021 17:12	WG1759447
Dibenz(a,h)anthracene	U		0.0000480	0.000150	3	10/20/2021 17:12	WG1759447
Fluoranthene	U		0.0000810	0.000300	3	10/20/2021 17:12	WG1759447
Fluorene	U		0.0000507	0.000150	3	10/20/2021 17:12	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000474	0.000150	3	10/20/2021 17:12	WG1759447
Naphthalene	U		0.000275	0.000750	3	10/20/2021 17:12	WG1759447
Phenanthrene	U		0.0000540	0.000150	3	10/20/2021 17:12	WG1759447
Pyrene	0.0000589	J	0.0000507	0.000150	3	10/20/2021 17:12	WG1759447
1-Methylnaphthalene	U		0.000206	0.000750	3	10/20/2021 17:12	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	U		0.000202	0.000750	3	10/20/2021 17:12	WG1759447
(S) Nitrobenzene-d5	90.6			31.0-160		10/20/2021 17:12	WG1759447
(S) 2-Fluorobiphenyl	90.6			48.0-148		10/20/2021 17:12	WG1759447
(S) p-Terphenyl-d14	90.6			37.0-146		10/20/2021 17:12	WG1759447

Sample Narrative:

L1418546-07 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	19.0		0.504	3.00	1	11/02/2021 14:08	WG1765498

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	10/22/2021 19:09	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	96.4			50.0-150		10/22/2021 19:09	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	97.9			79.0-125		10/22/2021 19:09	WG1761611

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

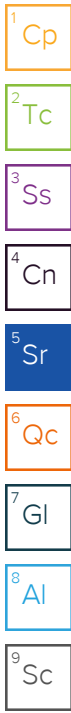
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	10/23/2021 23:19	WG1762372
n-Butylbenzene	U		0.000157	0.00100	1	10/23/2021 23:19	WG1762372
sec-Butylbenzene	U		0.000125	0.00100	1	10/23/2021 23:19	WG1762372
tert-Butylbenzene	U		0.000127	0.00100	1	10/23/2021 23:19	WG1762372
Ethylbenzene	U		0.000137	0.00100	1	10/23/2021 23:19	WG1762372
Isopropylbenzene	0.000532	J	0.000105	0.00100	1	10/23/2021 23:19	WG1762372
Naphthalene	U		0.00100	0.00500	1	10/23/2021 23:19	WG1762372
Toluene	U		0.000278	0.00100	1	10/23/2021 23:19	WG1762372
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/23/2021 23:19	WG1762372
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/23/2021 23:19	WG1762372
Total Xylenes	0.000454	J	0.000174	0.00300	1	10/23/2021 23:19	WG1762372
(S) Toluene-d8	98.2			80.0-120		10/23/2021 23:19	WG1762372
(S) 4-Bromofluorobenzene	95.1			77.0-126		10/23/2021 23:19	WG1762372
(S) 1,2-Dichloroethane-d4	126			70.0-130		10/23/2021 23:19	WG1762372

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	2.84		0.240	0.840	1.05	10/27/2021 18:27	WG1762546
(S) o-Terphenyl	92.1			50.0-150		10/27/2021 18:27	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 17:32	WG1759447
Acenaphthene	U		0.0000380	0.000100	2	10/20/2021 17:32	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 17:32	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 17:32	WG1759447
Benzo(a)pyrene	U		0.0000368	0.000100	2	10/20/2021 17:32	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 17:32	WG1759447
Benzo(g,h,i)perylene	U		0.0000368	0.000100	2	10/20/2021 17:32	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 17:32	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 17:32	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 17:32	WG1759447
Fluoranthene	U		0.0000540	0.000200	2	10/20/2021 17:32	WG1759447
Fluorene	U		0.0000338	0.000100	2	10/20/2021 17:32	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000316	0.000100	2	10/20/2021 17:32	WG1759447
Naphthalene	U		0.000183	0.000500	2	10/20/2021 17:32	WG1759447
Phenanthrene	U		0.0000360	0.000100	2	10/20/2021 17:32	WG1759447
Pyrene	U		0.0000338	0.000100	2	10/20/2021 17:32	WG1759447
1-Methylnaphthalene	U		0.000137	0.000500	2	10/20/2021 17:32	WG1759447



Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	U		0.000135	0.000500	2	10/20/2021 17:32	WG1759447
(S) Nitrobenzene-d5	93.7			31.0-160		10/20/2021 17:32	WG1759447
(S) 2-Fluorobiphenyl	94.2			48.0-148		10/20/2021 17:32	WG1759447
(S) p-Terphenyl-d14	98.9			37.0-146		10/20/2021 17:32	WG1759447

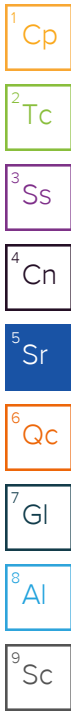
Sample Narrative:

L1418546-08 WG1759447: Dilution due to matrix impact during extraction procedure

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

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Sodium	157		0.504	3.00	1	11/02/2021 14:11	WG1765498



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	2.06		0.0287	0.100	1	10/22/2021 19:31	WG1761611
(S) a,a,a-Trifluorotoluene(FID)	97.6			50.0-150		10/22/2021 19:31	WG1761611
(S) a,a,a-Trifluorotoluene(PID)	102			79.0-125		10/22/2021 19:31	WG1761611

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	0.00124		0.0000941	0.00100	1	10/23/2021 23:38	WG1762372
n-Butylbenzene	0.00232		0.000157	0.00100	1	10/23/2021 23:38	WG1762372
sec-Butylbenzene	0.00316		0.000125	0.00100	1	10/23/2021 23:38	WG1762372
tert-Butylbenzene	0.000261	J	0.000127	0.00100	1	10/23/2021 23:38	WG1762372
Ethylbenzene	0.0584		0.000137	0.00100	1	10/23/2021 23:38	WG1762372
Isopropylbenzene	0.0140		0.000105	0.00100	1	10/23/2021 23:38	WG1762372
Naphthalene	0.00454	J	0.00100	0.00500	1	10/23/2021 23:38	WG1762372
Toluene	0.00156		0.000278	0.00100	1	10/23/2021 23:38	WG1762372
1,2,4-Trimethylbenzene	0.402		0.00322	0.0100	10	10/27/2021 14:57	WG1764465
1,3,5-Trimethylbenzene	0.0819		0.000104	0.00100	1	10/23/2021 23:38	WG1762372
Total Xylenes	0.238		0.00174	0.0300	10	10/27/2021 14:57	WG1764465
(S) Toluene-d8	94.9			80.0-120		10/23/2021 23:38	WG1762372
(S) Toluene-d8	97.8			80.0-120		10/27/2021 14:57	WG1764465
(S) 4-Bromofluorobenzene	98.8			77.0-126		10/23/2021 23:38	WG1762372
(S) 4-Bromofluorobenzene	96.8			77.0-126		10/27/2021 14:57	WG1764465
(S) 1,2-Dichloroethane-d4	119			70.0-130		10/23/2021 23:38	WG1762372
(S) 1,2-Dichloroethane-d4	119			70.0-130		10/27/2021 14:57	WG1764465

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	1.56		0.240	0.840	1.05	10/27/2021 18:48	WG1762546
(S) o-Terphenyl	100			50.0-150		10/27/2021 18:48	WG1762546

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Anthracene	U		0.0000380	0.000100	2	10/20/2021 17:52	WG1759447
Acenaphthene	0.000116		0.0000380	0.000100	2	10/20/2021 17:52	WG1759447
Acenaphthylene	U		0.0000342	0.000100	2	10/20/2021 17:52	WG1759447
Benzo(a)anthracene	U		0.0000406	0.000100	2	10/20/2021 17:52	WG1759447
Benzo(a)pyrene	U		0.0000368	0.000100	2	10/20/2021 17:52	WG1759447
Benzo(b)fluoranthene	U		0.0000336	0.000100	2	10/20/2021 17:52	WG1759447
Benzo(g,h,i)perylene	U		0.0000368	0.000100	2	10/20/2021 17:52	WG1759447
Benzo(k)fluoranthene	U		0.0000404	0.000100	2	10/20/2021 17:52	WG1759447
Chrysene	U		0.0000358	0.000100	2	10/20/2021 17:52	WG1759447
Dibenz(a,h)anthracene	U		0.0000320	0.000100	2	10/20/2021 17:52	WG1759447
Fluoranthene	U		0.0000540	0.000200	2	10/20/2021 17:52	WG1759447
Fluorene	0.000151		0.0000338	0.000100	2	10/20/2021 17:52	WG1759447
Indeno(1,2,3-cd)pyrene	U		0.0000316	0.000100	2	10/20/2021 17:52	WG1759447
Naphthalene	0.00435		0.000183	0.000500	2	10/20/2021 17:52	WG1759447

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Phenanthrene	0.0000567	J	0.0000360	0.000100	2	10/20/2021 17:52	WG1759447
Pyrene	U		0.0000338	0.000100	2	10/20/2021 17:52	WG1759447
1-Methylnaphthalene	0.00157		0.000137	0.000500	2	10/20/2021 17:52	WG1759447
2-Methylnaphthalene	0.00191		0.000135	0.000500	2	10/20/2021 17:52	WG1759447
(S) Nitrobenzene-d5	105			31.0-160		10/20/2021 17:52	WG1759447
(S) 2-Fluorobiphenyl	95.8			48.0-148		10/20/2021 17:52	WG1759447
(S) p-Terphenyl-d14	111			37.0-146		10/20/2021 17:52	WG1759447

Sample Narrative:

L1418546-09 WG1759447: Dilution due to matrix impact during extraction procedure

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3724693-1 11/02/21 13:28

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Sodium	U		0.504	3.00

¹Cp

²Tc

³Ss

Laboratory Control Sample (LCS)

(LCS) R3724693-2 11/02/21 13:31

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Sodium	10.0	10.6	106	80.0-120	

⁴Cn

⁵Sr

L1418590-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1418590-07 11/02/21 13:33 • (MS) R3724693-4 11/02/21 13:39 • (MSD) R3724693-5 11/02/21 13:41

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Sodium	10.0	2.73	12.5	12.4	97.9	96.9	1	75.0-125			0.780	20

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3721349-2 10/22/21 15:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPHGAK C6 to C10	U		0.0287	0.100
(S) a,a,a-Trifluorotoluene(PID)	98.1			79.0-125
(S) a,a,a-Trifluorotoluene(FID)	96.9			60.0-120

Laboratory Control Sample (LCS)

(LCS) R3721349-1 10/22/21 14:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPHGAK C6 to C10	5.00	5.29	106	60.0-120	
(S) a,a,a-Trifluorotoluene(PID)			130	79.0-125	<u>J1</u>
(S) a,a,a-Trifluorotoluene(FID)			114	60.0-120	

L1418584-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1418584-01 10/22/21 19:53 • (MS) R3721349-3 10/22/21 23:10 • (MSD) R3721349-4 10/22/21 23:32

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	0.0324	4.90	4.99	97.4	99.2	1	70.0-130			1.82	20
(S) a,a,a-Trifluorotoluene(PID)					127	126		79.0-125	<u>J1</u>	<u>J1</u>		
(S) a,a,a-Trifluorotoluene(FID)					116	116		50.0-150				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3722245-2 10/24/21 02:04

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
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	101			80.0-120
(S) 4-Bromofluorobenzene	102			77.0-126
(S) 1,2-Dichloroethane-d4	113			70.0-130

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3722245-1 10/24/21 01:21

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00480	96.0	70.0-123	
n-Butylbenzene	0.00500	0.00445	89.0	73.0-125	
sec-Butylbenzene	0.00500	0.00453	90.6	75.0-125	
tert-Butylbenzene	0.00500	0.00444	88.8	76.0-124	
Ethylbenzene	0.00500	0.00468	93.6	79.0-123	
Isopropylbenzene	0.00500	0.00454	90.8	76.0-127	
Naphthalene	0.00500	0.00441	88.2	54.0-135	
Toluene	0.00500	0.00446	89.2	79.0-120	
1,2,4-Trimethylbenzene	0.00500	0.00460	92.0	76.0-121	
1,3,5-Trimethylbenzene	0.00500	0.00467	93.4	76.0-122	
Xylenes, Total	0.0150	0.0133	88.7	79.0-123	
(S) Toluene-d8			99.2	80.0-120	
(S) 4-Bromofluorobenzene			100	77.0-126	
(S) 1,2-Dichloroethane-d4			120	70.0-130	

Method Blank (MB)

(MB) R3721790-3 10/23/21 22:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000941	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
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	96.5			80.0-120
(S) 4-Bromofluorobenzene	93.3			77.0-126
(S) 1,2-Dichloroethane-d4	127			70.0-130

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3721790-1 10/23/21 21:25 • (LCSD) R3721790-2 10/23/21 21:44

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	0.00469	0.00469	93.8	93.8	70.0-123			0.000	20
n-Butylbenzene	0.00500	0.00433	0.00438	86.6	87.6	73.0-125			1.15	20
sec-Butylbenzene	0.00500	0.00444	0.00448	88.8	89.6	75.0-125			0.897	20
tert-Butylbenzene	0.00500	0.00428	0.00424	85.6	84.8	76.0-124			0.939	20
Ethylbenzene	0.00500	0.00430	0.00424	86.0	84.8	79.0-123			1.41	20
Isopropylbenzene	0.00500	0.00406	0.00400	81.2	80.0	76.0-127			1.49	20
Naphthalene	0.00500	0.00414	0.00366	82.8	73.2	54.0-135			12.3	20
Toluene	0.00500	0.00432	0.00429	86.4	85.8	79.0-120			0.697	20
1,2,4-Trimethylbenzene	0.00500	0.00473	0.00450	94.6	90.0	76.0-121			4.98	20
1,3,5-Trimethylbenzene	0.00500	0.00473	0.00478	94.6	95.6	76.0-122			1.05	20
Xylenes, Total	0.0150	0.0124	0.0123	82.7	82.0	79.0-123			0.810	20
(S) Toluene-d8				97.6	96.0	80.0-120				
(S) 4-Bromofluorobenzene				94.9	95.4	77.0-126				
(S) 1,2-Dichloroethane-d4				118	117	70.0-130				

Method Blank (MB)

(MB) R3722202-2 10/27/21 06:43

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
1,2,4-Trimethylbenzene	U		0.000322	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	101			80.0-120
(S) 4-Bromofluorobenzene	95.1			77.0-126
(S) 1,2-Dichloroethane-d4	118			70.0-130

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

(LCS) R3722202-1 10/27/21 06:00 • (LCSD) R3722202-3 10/27/21 18:01

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
1,2,4-Trimethylbenzene	0.00500	0.00474	0.00467	94.8	93.4	76.0-121			1.49	20
Xylenes, Total	0.0150	0.0137	0.0130	91.3	86.7	79.0-123			5.24	20
(S) Toluene-d8				96.5	95.5	80.0-120				
(S) 4-Bromofluorobenzene				95.1	95.8	77.0-126				
(S) 1,2-Dichloroethane-d4				120	118	70.0-130				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3722277-1 10/27/21 13:21

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
AK102 DRO C10-C25	U		0.229	0.800
<i>(S) o-Terphenyl</i>	86.3			60.0-120

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

(LCS) R3722277-2 10/27/21 13:41 • (LCSD) R3722277-3 10/27/21 14:01

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
AK102 DRO C10-C25	6.00	5.88	6.38	98.0	106	75.0-125			8.16	20
<i>(S) o-Terphenyl</i>				115	116	60.0-120				

L1418584-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1418584-01 10/27/21 19:08 • (MS) R3722277-6 10/27/21 19:28 • (MSD) R3722277-7 10/27/21 19:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
AK102 DRO C10-C25	6.00	0.831	6.41	6.03	93.0	86.7	1	75.0-125			6.11	20
<i>(S) o-Terphenyl</i>					59.1	81.8		50.0-150				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3719107-3 10/20/21 14:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Anthracene	U		0.0000190	0.0000500
Acenaphthene	U		0.0000190	0.0000500
Acenaphthylene	U		0.0000171	0.0000500
Benzo(a)anthracene	U		0.0000203	0.0000500
Benzo(a)pyrene	U		0.0000184	0.0000500
Benzo(b)fluoranthene	U		0.0000168	0.0000500
Benzo(g,h,i)perylene	U		0.0000184	0.0000500
Benzo(k)fluoranthene	U		0.0000202	0.0000500
Chrysene	U		0.0000179	0.0000500
Dibenz(a,h)anthracene	U		0.0000160	0.0000500
Fluoranthene	U		0.0000270	0.000100
Fluorene	U		0.0000169	0.0000500
Indeno(1,2,3-cd)pyrene	U		0.0000158	0.0000500
Naphthalene	U		0.0000917	0.000250
Phenanthrene	U		0.0000180	0.0000500
Pyrene	U		0.0000169	0.0000500
1-Methylnaphthalene	U		0.0000687	0.000250
2-Methylnaphthalene	U		0.0000674	0.000250
(S) Nitrobenzene-d5	109			31.0-160
(S) 2-Fluorobiphenyl	112			48.0-148
(S) p-Terphenyl-d14	131			37.0-146

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

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

(LCS) R3719107-1 10/20/21 14:13 • (LCSD) R3719107-2 10/20/21 14:33

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 %
Anthracene	0.00200	0.00186	0.00177	93.0	88.5	67.0-150			4.96	20
Acenaphthene	0.00200	0.00192	0.00168	96.0	84.0	65.0-138			13.3	20
Acenaphthylene	0.00200	0.00184	0.00166	92.0	83.0	66.0-140			10.3	20
Benzo(a)anthracene	0.00200	0.00191	0.00189	95.5	94.5	61.0-140			1.05	20
Benzo(a)pyrene	0.00200	0.00183	0.00183	91.5	91.5	60.0-143			0.000	20
Benzo(b)fluoranthene	0.00200	0.00187	0.00194	93.5	97.0	58.0-141			3.67	20
Benzo(g,h,i)perylene	0.00200	0.00182	0.00184	91.0	92.0	52.0-153			1.09	20
Benzo(k)fluoranthene	0.00200	0.00184	0.00188	92.0	94.0	58.0-148			2.15	20
Chrysene	0.00200	0.00196	0.00197	98.0	98.5	64.0-144			0.509	20
Dibenz(a,h)anthracene	0.00200	0.00176	0.00178	88.0	89.0	52.0-155			1.13	20
Fluoranthene	0.00200	0.00199	0.00198	99.5	99.0	69.0-153			0.504	20
Fluorene	0.00200	0.00204	0.00191	102	95.5	64.0-136			6.58	20

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

(LCS) R3719107-1 10/20/21 14:13 • (LCSD) R3719107-2 10/20/21 14:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Indeno(1,2,3-cd)pyrene	0.00200	0.00175	0.00178	87.5	89.0	54.0-153			1.70	20
Naphthalene	0.00200	0.00195	0.00160	97.5	80.0	61.0-137			19.7	20
Phenanthrene	0.00200	0.00190	0.00185	95.0	92.5	62.0-137			2.67	20
Pyrene	0.00200	0.00199	0.00198	99.5	99.0	60.0-142			0.504	20
1-Methylnaphthalene	0.00200	0.00201	0.00166	100	83.0	66.0-142			19.1	20
2-Methylnaphthalene	0.00200	0.00191	0.00157	95.5	78.5	62.0-136			19.5	20
<i>(S) Nitrobenzene-d5</i>				99.0	99.5	31.0-160				
<i>(S) 2-Fluorobiphenyl</i>				98.5	100	48.0-148				
<i>(S) p-Terphenyl-d14</i>				114	115	37.0-146				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

GLOSSARY OF TERMS

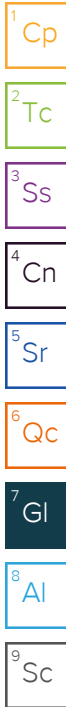
Guide to Reading and Understanding Your Laboratory Report

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
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.



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	LA000356
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.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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
 Analysis / Container / Preservative

Chain of Custody Page 1 of 1

 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/hubs/pas-standard-terms.pdf>

Report to:
Ms. Leslie Petre

Email To: craig.cothron@pacelabs.com

Project Description:
 Speedway 5315 TNS 111 **5310-112**

City/State Collected: **North Pole, AK**
 Please Circle: **AK** PT MT CT ET

Phone: **907-266-1108**
450-1428

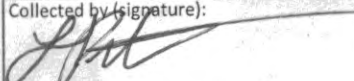
Client Project #

Lab Project #
STAAAKSSA-5315

Collected by (print):
Leslie Petre & Geoff Moorhead

Site/Facility ID #
0005315

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


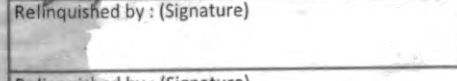
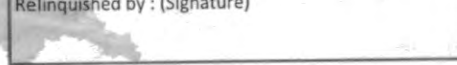
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	AK101 40mlAmb HCl	AK102 100ml Amb HCl	NAICP 250mlHDPE-HNO3	PAHSIMLVID 40mlAmb-NoPres-WT	V8260C 40mlAmb-HCl								
MW-2	G	GW		10/13/21	1425	11	X	X	X	X	X								-01
MW-3	G	GW		10/13/21	1455	11	X	X	X	X	X								-02
MW-6	G	GW		10/13/21	1038	11	X	X	X	X	X								-03
MW-10	G	GW		10/13/21	1105	11	X	X	X	X	X								-04
MW17-2	G	GW		10/13/21	1305	11	X	X	X	X	X								-05
MW17-5	G	GW		10/13/21	1345	11	X	X	X	X	X								-06
MW-1	G	GW		10/13/21	1240	11	X	X	X	X	X								-07
MW-4	G	GW		10/13/21	1200	11	X	X	X	X	X								-08
DUPLICATE	G	GW		10/13/21	1305	11	X	X	X	X	X								-09

SDC # **C187**
 Acctnum: **STAAAKSSA**
 Template: **T175452**
 Prelogin: **P875082**
 PM: **034 - Craig Cothron**
 PB: **Geoff Moorhead**
 Shipped Via: **FedEX 2nd Day**

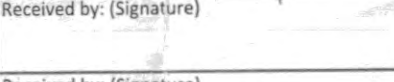
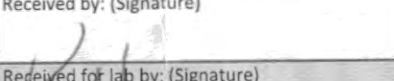
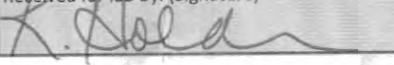
* Matrix:
 SS - Soil AIR - Air F - Filter
 GW - Groundwater B - Bioassay
 WW - WasteWater
 DW - Drinking Water
 OT - Other

Remarks:
 Samples returned via: UPS FedEx Courier
 Tracking # **5318 9946 0268/0259**
 pH _____ Temp _____
 Flow _____ Other _____

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 Headpace: Y N
 Preservation Correct/Checked: Y N
 RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature)

 Relinquished by: (Signature)

 Relinquished by: (Signature)


Date: **10/14/21** Time: **1100**

Received by: (Signature)

 Received by: (Signature)

 Received for lab by: (Signature)


Trip Blank Received: Yes/No
 HCL/MeoH
 TBR
 Temp: **20 = 2** °C
 Bottles Received: **99**

If preservation required by Login: Date/Time
 Hold: _____ Condition: **NCF / OK**

257.0 = 2.5 APT (Cooler 1)

Laboratory Data Review Checklist

Completed By:

Austin Badger

Title:

Engineer in Training

Date:

12/7/2021

Consultant Firm:

Stantec Consulting Services, Inc.

Laboratory Name:

Pace Analytical

Laboratory Report Number:

L1418546

Laboratory Report Date:

11/18/2021

CS Site Name:

Tesoro - Northstore #112

ADEC File Number:

100.26.159

Hazard Identification Number:

24476

L1418546

Laboratory Report Date:

11/18/2021

CS Site Name:

Tesoro - Northstore #112

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:

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:

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

Yes No N/A Comments:

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

Yes No N/A Comments:

Samples received in good condition, and properly preserved.

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.

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:

No discrepancies, errors or QC failures identified by lab.

c. Were all corrective actions documented?

Yes No N/A Comments:

No corrective actions taken.

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

Comments:

No effect on data quality/usability.

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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 soil samples submitted to lab.

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

Yes No N/A Comments:

e. Data quality or usability affected?

No.

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:

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

Comments:

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

Yes No N/A Comments:

No affected samples.

v. Data quality or usability affected?

Comments:

No.

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:

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:

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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 affected samples.

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:

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:

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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:

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

Comments:

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:

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:

Laboratory Control Sample (LCS) for TPHGAK C6 to C10 ((LCS) R3721349-1)
Surrogate recovery for (S) a,a,a-trifluorotoluene(PID) exceeds recovery limits. Flagged with qualifier J1.
Matrix Spike (MS) Matrix Spike Duplicate (MSD) ((OS) L1418584-01 (MS) R3721349-3 (MSD) R3721349-4)
Surrogate recovery for (S) a,a,a-trifluorotoluene(PID) exceeds recovery limits for MS and MSD. Flagged with qualifier J1.

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:

Yes, qualifier J1 defined as “Surrogate recovery limits have been exceeded; values are outside upper control limits.”

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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:

Trip blank not submitted to lab.

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:

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

Yes No N/A Comments:

Trip blank not submitted to lab.

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

Comments:

v. Data quality or usability affected?

Comments:

No.

f. Field Duplicate

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

Yes No N/A Comments:

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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)

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

Where R₁ = Sample Concentration
R₂ = Field Duplicate Concentration

Yes No N/A Comments:

RPD for Toluene (47.43%) and GRO (30.81%) exceed specified project objective.

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

Comments:

No. Lab results less than project specified objects.

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

Yes No N/A Comments:

No reusable equipment used during sampling.

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

Yes No N/A Comments:

No decontamination or equipment blank analyzed.

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

Comments:

iii. Data quality or usability affected?

Comments:

No.

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

a. Defined and appropriate?

Yes No N/A

Comments: