

Appendix K – Phase II Environmental Site Assessment



**GEOTEK ENGINEERING
& TESTING SERVICES, INC.**

909 East 50th Street North
Sioux Falls, South Dakota 57104
605-335-5512 Fax 605-335-0773

August 25, 2023

City of Sioux Falls (Public Works-Engineering)
231 N. Dakota Ave
Sioux Falls, SD 57104

Attn: Ms. Shannon Ausen, PE

Subj: Phase II Environmental Site Assessment
Former Taylor Oil Company
3600 S. Minnesota Ave
Sioux Falls, SD
GeoTek #23-1127
DANR #pending
PRCF #8677

Dear Ms. Ausen:

This correspondence presents the results of the Phase II Environmental Site Assessment completed at the referenced facility. We are sending an electronic copy of the report. Additional copies are being sent as noted below.

We thank you for the opportunity of providing our services on this project. Please contact our office if you have any questions regarding the project or the report.

Respectfully submitted,

Jerald K. Zutz
Senior Project Manager
SD PE/Remediator #5083

cc: DANR, Pierre
PRCF, Pierre, Attn: Mr. John McVey
PRCF, Mitchell, Attn: Mr. Brett Schutte

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INTRODUCTION

Purpose and Scope

The purpose of our work for this portion of the project was to perform a Phase II Environmental Site Assessment to determine the presence and/or concentrations of petroleum in soil and groundwater at the site.

The scope of our work for this portion of the project was limited to the following:

1. Mobilizing a drill rig, crew and environmental personnel to the site.
2. Contacting South Dakota One Call to mark known underground public utility lines at the site.
3. Advancing 8 soil borings up to approximately 19½' deep.
4. Collecting and scanning soil samples from the borings/excavations with a photoionization detector (PID) for total organic vapors.
5. Collecting and submitting one soil sample from each boring to a chemistry laboratory for analysis for benzene, toluene, ethylbenzene, xylenes, MTBE, and Total Petroleum Hydrocarbons (TPH) as gasoline, naphthalene, and Total Extractible Hydrocarbons (TEH) as diesel.
6. Completing four soil borings as groundwater monitoring wells.
7. Measuring approximate depth to groundwater in the borings, and/or groundwater monitoring wells.
8. Collecting and submitting one groundwater sample from each monitoring well to a chemistry laboratory for analysis for benzene, toluene, ethylbenzene, xylenes, MTBE, and Total Petroleum Hydrocarbons (TPH) as gasoline, naphthalene, and Total Extractible Hydrocarbons (TEH) as diesel.
9. Preparing a report presenting our data, opinions, and recommendations.

Authorization

This work was performed in accordance with the March 22, 2023 contract (signed on July 10, 2023), and the SD Petroleum Release Compensation Fund (PRCF) letter of July 11, 2023.

BACKGROUND INFORMATION

General

The site is the former location of a bulk oil company. Historical aerial photos show many petroleum Aboveground Storage Tanks (ASTs) were located on-site from about 1958 to 1999.

The most recent SD DANR record lists these (removed) ASTs on-site:

#	Product	Capacity (gallons)	Year Installed
1	Gasoline	200,000	1983
2	Diesel	200,000	1983
3	not listed	12,000	1984
4	unknown	12,000	1984
5	unknown	12,000	1984
6	Gasoline	12,000	1984
7	Gasoline	12,000	1984
8	Diesel	500,000	1984
9	Fuel Oil	1000	1998

There are two SD Department of Environment and Natural Resources (DANR) environmental events for this property:

DANR #93.348 Taylor Oil Co., 3600 S. Minnesota Ave. In October, 1993, a report of soil sampling was submitted to DANR. Four soil samples were taken at the time of removal of two 200,000 gallon gasoline ASTs. The samples had from <1 to 2.3 ppm TPH (lab). Because the concentrations were below regulated amounts, the file was closed.

DANR #99021.000 Taylor Oil Bulk Site, 3600 S. Minnesota Avenue. Soil samples were collected and analyzed from below removed ASTs #5-9 in March 1999. Petroleum was not detected. The May 19, 2000 DENR letter required no further actions.

The site is located in the NW1/4, Section 33, T101N, R49W, City of Sioux Falls, Minnehaha County, South Dakota. Figure 1 is a topographic map of the area. Figure 2 is a recent aerial photo of the site area.

PHASE II ENVIRONMENTAL SITE ASSESSMENT

General

Soil borings were advanced and groundwater monitoring wells installed in the former petroleum ASTs, loading, and truck parking areas of the site.

Soil Boring and Sampling

Eight soil borings (SB1, SB2, SB3, SB4, MW1, MW2, MW3, and MW4) were advanced on-site on August 4, 2023 following completion of a SD One Call utility locate. Split barrel sampling of the soils was performed at 2' to 2½' intervals in the borings. The borings extended to depths of approximately 19½' below grade, unless obstruction was encountered above this depth. Obstructions were encountered in 5 borings. SB1, SB2, SB3, and MW2 encountered obstruction from 6.5' to 12.6' deep, presumably the Sioux Quartzite bedrock. SB4 encountered an obstruction at 1.9' deep, perhaps buried concrete. The subsurface conditions encountered at the boring locations are illustrated on the boring logs in Appendix A. The locations of the borings are illustrated on Figure 3.

A review of the boring logs indicates a generalized subsurface profile consisting about 9½' of mostly clay fill, underlain by sandy lean clay, lean clay with sand (glacial till), and/or sand.

Soil Sample Scanning

Soil samples recovered from the borings were scanned in the field with a photoionization detector (PID) for organic vapors as an indication of petroleum contamination. The PID data is provided on Table 1 and on a column of the boring logs in Appendix A.

Elevated PID readings were encountered in all soil borings except SB1 and SB4. The depths at which elevated PID readings were first encountered varied from 2' deep to 9½' deep.

Soil Sample Analysis

One soil sample from each of seven borings (at the high PID reading interval) was submitted on August 7, 2023 to a chemistry laboratory for benzene, ethylbenzene, toluene, xylenes (BETX), MTBE, naphthalene, total petroleum hydrocarbons (TPH) as gasoline, and total extractable hydrocarbons (TEH) as diesel fuel analysis. A soil sample was not submitted from SB4 as it encountered a shallow obstruction at 1.9' deep. A summary of the soil boring petroleum analytical data is provided on Table 2. The laboratory report is provided in Appendix B.

Petroleum was not detected in the soil samples from SB1, SB3 or MW4 at or above the reporting limit for the parameters analyzed. Petroleum was detected in four of the seven soil samples submitted (SB2, MW1, MW2, MW3) at 18 to 61.2 parts per million (ppm) TPH as gasoline, and 32.7 to 613 ppm TEH as diesel.

The DANR Tier 1 Action Level was exceeded in one sample (benzene in MW3). The DANR Trigger Level of 500 ppm TPH was exceeded in one sample (MW3). The DANR Look Up Table for Surface Soil levels for residential (0-3.2' deep), commercial (0-3.2' deep) or construction worker exposure (0-9' deep) were not exceeded.

Monitoring Well Installation

Groundwater monitoring wells were completed in four of the soil borings (MW1, MW2, MW3, MW4) at the locations illustrated on Figures 3 and 4. The monitoring well construction details are provided on the logs in Appendix A.

Groundwater Elevations and Gradient

Depth to groundwater was measured in the monitoring wells on August 10, 2023. Free phase product was not detected in the wells. The monitoring well water level data is presented on Table 3. Depth to groundwater was about 6' to 7' below grade. Figure 4 is an estimated groundwater contour map for August 10, 2023. The August 10, 2023 groundwater gradient appeared to be southerly. Groundwater elevations may not have yet stabilized.

Note that the soil borings were advanced on August 4, 2023 during an extended dry period. On August 7, 2023, there was record rainfall in the Sioux Falls area (5.40" at Sioux Falls airport for the 24 hour period ending 7am August 7, 2023). The groundwater well water level measurements were taken on August 10, 2023. Therefore, the conditions at time of well installation and water level measurements/water sample collection were markedly different.

Groundwater Quality Sampling and Analysis

A groundwater sample was collected from each well (MW1, MW2, MW3, MW4) on August 10, 2023. The samples were submitted to a chemistry laboratory for benzene, ethylbenzene, toluene, xylenes (BETX), MTBE, naphthalene, TPH as gasoline, and TEH as diesel fuel analysis. The groundwater analytical data is summarized on Table 4 and the laboratory results are provided in Appendix C.

Petroleum was not detected in MW2 at or above the reporting limit for the parameters analyzed. Petroleum was detected in three of the monitoring well at 9.74 to 25.9 ppm TPH as Gasoline and up to 37.9 ppm TEH as Diesel. The South Dakota Groundwater Quality Standards (SDGWQS) were exceeded for two to three parameters in MW1, MW3, and MW4.

DISCUSSION

The extent of petroleum concentrations in soil is somewhat defined to the SD DANR Tier 1 Action Levels, except for the MW3 area. The extent of petroleum concentrations in groundwater is not defined.

A borrow pit and pond are proposed to be constructed on-site. The proposed project plans should take into account the elevation of bedrock, elevation of groundwater, and presence of petroleum in soil and groundwater.

Because of the petroleum detections, the current property owner appears to have an obligation to report this information to the SD Department of Agriculture and Natural Resources (DANR). DANR would review the existing information and determine what, if any, further testing or cleanup is necessary. As soil petroleum concentrations exceed 500 ppm TPH and Tier 1 Action Levels, and the Groundwater Quality Standards are exceeded, DANR would likely require additional assessment. Depending upon the results of the additional assessment, clean-up may be required.

Future potential subsurface work in this part of the site may encounter soil with substance concentrations. Excavated construction-derived soil may need to be taken to a permitted disposal facility. Likewise, the concentrations may limit future land use or require mitigation as part of development.

Elevated substance concentrations in soil could affect potential future use of site groundwater (i.e. water supply, building heating or cooling), water generated from drain tiles, sumps, infiltration of elevator pits, de-watering, etc. If so, water may be required to be tested, treated, and properly disposed during construction and/or the life of a building. If de-watering will be conducted, or if groundwater use was desired at the site, a review of the situation would be recommended. While testing could be done to assess the current groundwater quality, conditions could change over time, and pumping may induce contaminants to flow into a well.

CONCLUSIONS

The following opinions and conclusions are based on the results of the assessment data presented above.

1. Eight soil borings were recently advanced at the site. A review of the boring logs indicates a generalized subsurface profile consisting about 9½' of mostly clay fill, underlain by sandy lean clay, lean clay with sand (glacial till), and/or sand.
2. Petroleum concentrations were present in soil in four of seven soil samples from recent soil borings. Petroleum concentrations exceeded the SD DANR Tier 1 Action Levels and 500 ppm TPH Trigger Level in one soil boring (MW3).
3. Free phase product was not detected in MW1 to MW4 on August 10, 2023.
4. Petroleum concentrations were present in three of four groundwater samples from the monitoring wells, with three exceeding two to three state groundwater quality standards.
5. The source of the petroleum detected is likely the former on-site AST system (ASTs, piping, unloading and loading points, truck parking area, etc.).
6. There are nearby features (i.e. water main line, and sanitary sewer main) that could be potential receptors.

RECOMMENDATIONS

Based on the information presented above, we recommend the following:

- At least one or more future groundwater monitoring and free phase product measurement events be conducted to determine longer term groundwater petroleum concentrations and groundwater elevations/gradient direction.
- Consideration be given to conducting additional soil and groundwater assessment.

Construction derived contaminated materials generated during future construction activities (installation of utilities, excavation, grading, etc.) should be transported to a permitted landfill/landfarm for treatment and disposal. Appropriate worker health and safety measures should also be taken.

STANDARD OF CARE

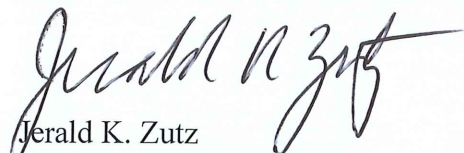
Conclusions and recommendations contained in the report represent our professional opinions. These opinions are based on information currently available and arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

REMARKS

Descriptions of the methods used during the project are provided in Appendix D. The soil samples collected during this work will be retained in our office for a period of thirty days from the date of this report. They will then be discarded unless we are notified otherwise.

GeoTek Engineering & Testing Services, Inc. appreciates the opportunity to have been of service on this project. Please contact us if you have any questions or if we can be of further service.

GEOTEK ENGINEERING & TESTING SERVICES, INC.



Jerald K. Zutz
Senior Project Manager
SD PE/Remediator #5083

This report was reviewed by:



Daniel R. Hanson
General Manager
SD PE/Remediator #4829

TABLE 1
SOIL BORING PID DATA

Sample Depth (ft)	SB1	SB2	SB3	SB4	MW1	MW2	MW3	MW4
0 - 2	ND	ND	ND	ND	ND	ND	ND	ND
2 - 4 ½	ND	ND	ND	---	ND	1.3	93	23
4 ½ - 7	ND *	ND	ND	---	3.0	17 *	27	5.0
7 - 9 ½	---	ND	2.0 *	---	121	2.2	232 *	42
9 ½ - 12	---	89 *	---	---	68	ND	41	49 *
12 - 14 ½	---	---	---	---	16	ND	6.0	4.0
14 ½ - 17	---	---	---	---	47	---	13	10.3
17 - 19½	---	---	---	---	151 *	---	12	4.7
Obstruction Depth (ft)	6.5	11.4	8.4	1.9	---	12.6	---	---

Notes: All values are in parts per million (ppm) of organic vapor.

ND = Not Detected (<1.0 ppm)

* - Additional soil sample from this location submitted for laboratory analysis.

See Figure 3 for soil boring locations.

TABLE 2
SOIL BORING PETROLEUM ANALYTICAL DATA

Sample Location	PID Reading (ppm)	Date Sampled	Benzene	Toluene	Ethyl-Benzene	Xylenes	Naphthalene	MTBE	TPH as Gasoline	TEH as Diesel
SB1 (4½ - 6.5')	ND	8-4-23	<0.0990	<0.0990	<0.0990	<0.297	<0.972	<0.0990	<9.90	<9.72
SB2 (9½ - 11.4')	89	8-4-23	<0.0980	<0.0980	0.238	0.633	1.63	<0.0980	61.2	193
SB3 (7 - 8.4')	2.0	8-4-23	<0.0988	<0.0988	<0.0988	<0.296	<0.967	<0.0988	<9.88	<9.67
MW1 (17 - 19½')	151	8-4-23	<0.0910	<0.0910	<0.0910	<0.273	<0.957	<0.0910	18.0	32.7
MW2 (4½ - 7')	17	8-4-23	<0.0958	<0.0958	<0.0958	<0.287	<0.963	<0.0958	59.3	39.2
MW3 (7 - 9½')	232	8-4-23	0.861	<0.0987	7.55	9.20	9.51	0.305	58.9	613
MW4 (9½ - 12')	49	8-4-23	<0.0981	<0.0981	<0.0981	<0.294	<0.944	<0.0981	<9.81	<9.44
SD Tier 1 Action/Trigger Levels			0.2	15	10	300	25		500	500
Surface Soil Look-up Table										
0-3.2' residential			17	>750	>630	>500	200	>620		
0-3.2' commercial			28	>750	>630	>500	280	>620		
0-9' construction worker			19	>750	>630	>500	371	>620		

Notes: All analytical values are in mg/kg which is equivalent to parts per million (ppm).

See Figure 3 for soil boring locations.

TABLE 3
GROUNDWATER LEVEL DATA

Location	Top of Riser Elevation (ft) *	Date	Depth to Water Below TOR (ft)	Groundwater Elevation (ft)
MW1	100.48	08-10-23	7.08	93.40
MW2	99.96	08-10-23	5.49	94.47
MW3	99.04	08-10-23	5.53	93.51
MW4	98.95	08-10-23	5.68	93.27

Notes: See Figures 3 and 4 for monitoring well locations.

* = Elevations of MW1, MW2, MW3, and MW4 were referenced to the rim of a sanitary sewer manhole on the south central part of the site.

TABLE 4
GROUNDWATER PETROLEUM ANALYTICAL DATA

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-Benzene	Xylenes	Naphthalene	MTBE	TPH as Gasoline	TEH as Diesel
MW1	08-10-23	0.0566	0.00417	0.357	1.730	0.335	0.00608	9.740	37.900
MW2	08-10-23	<0.00200	<0.00200	<0.00200	<0.00600	<0.0196	<0.00200	<0.500	<0.294
MW3	08-10-23	0.0798	0.0235	0.940	1.080	0.319	0.106	18.000	<0.283
MW4	08-10-23	0.107	0.00480	0.119	<0.00600	0.275	0.105	25.900	23.600
SDGWQS		0.005	1.0	0.7	10	---	---	10 *	10 *

Notes: All analytical values are in mg/L which is equivalent to parts per million (ppm).

See Figures 3 and 4 for monitoring well locations.

SDGWQS = South Dakota Groundwater Quality Standards.

* = standard may be 0.1 ppm TPH if within the radius of influence of a well or within a delineated wellhead protection area.

Values in **bold** type exceed SDGWQS.

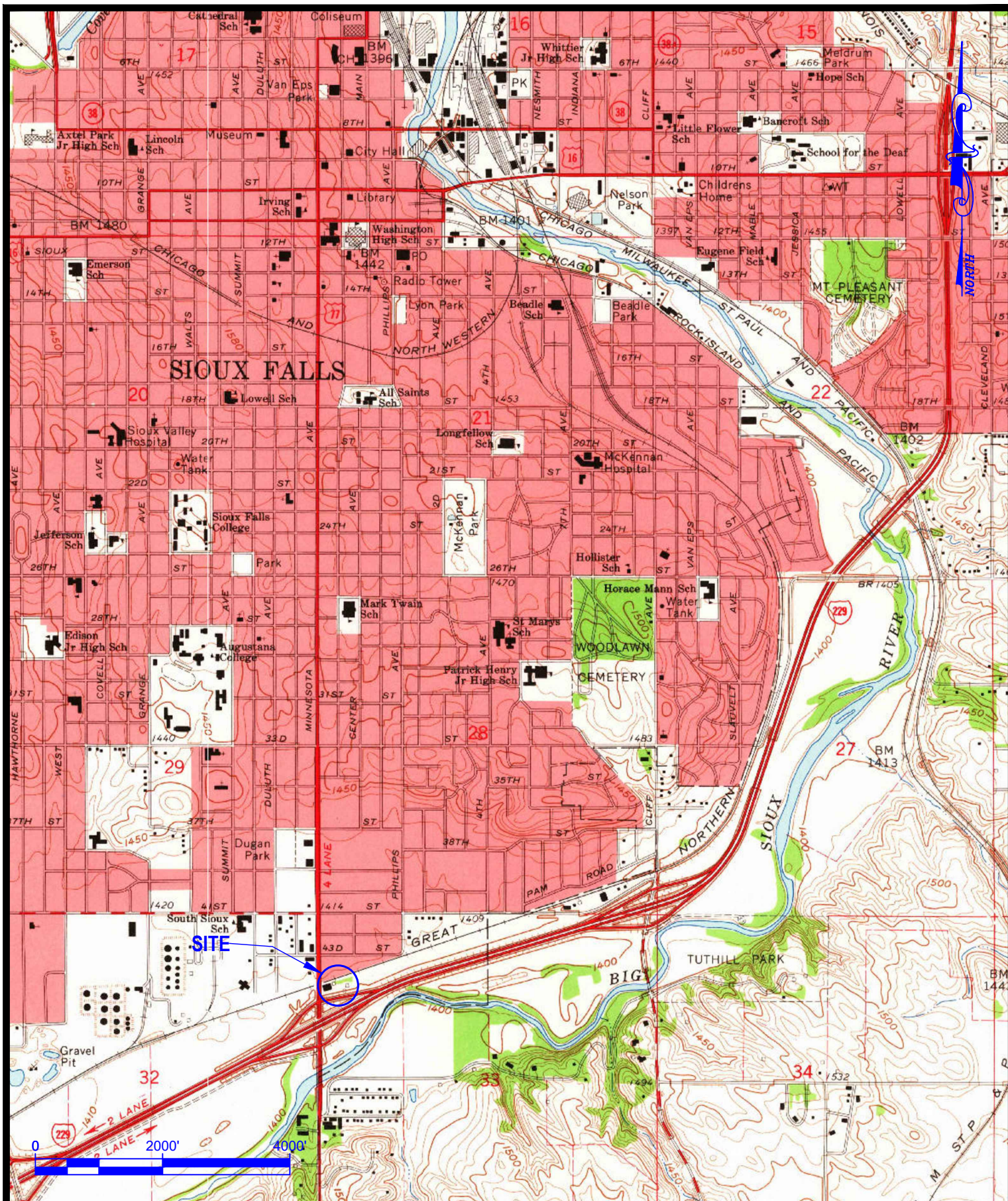


FIGURE 1
TOPOGRAPHIC MAP
FORMER TAYLOR OIL CO.
3600 SOUTH MINNESOTA AVENUE
SIOUX FALLS, SD

ACAD/GEOTEK/JERRY/23-1127

PROJECT#: 23-1127

DRAWN BY: PRH



GEOTEK ENGINEERING & TESTING SERVICES, INC.

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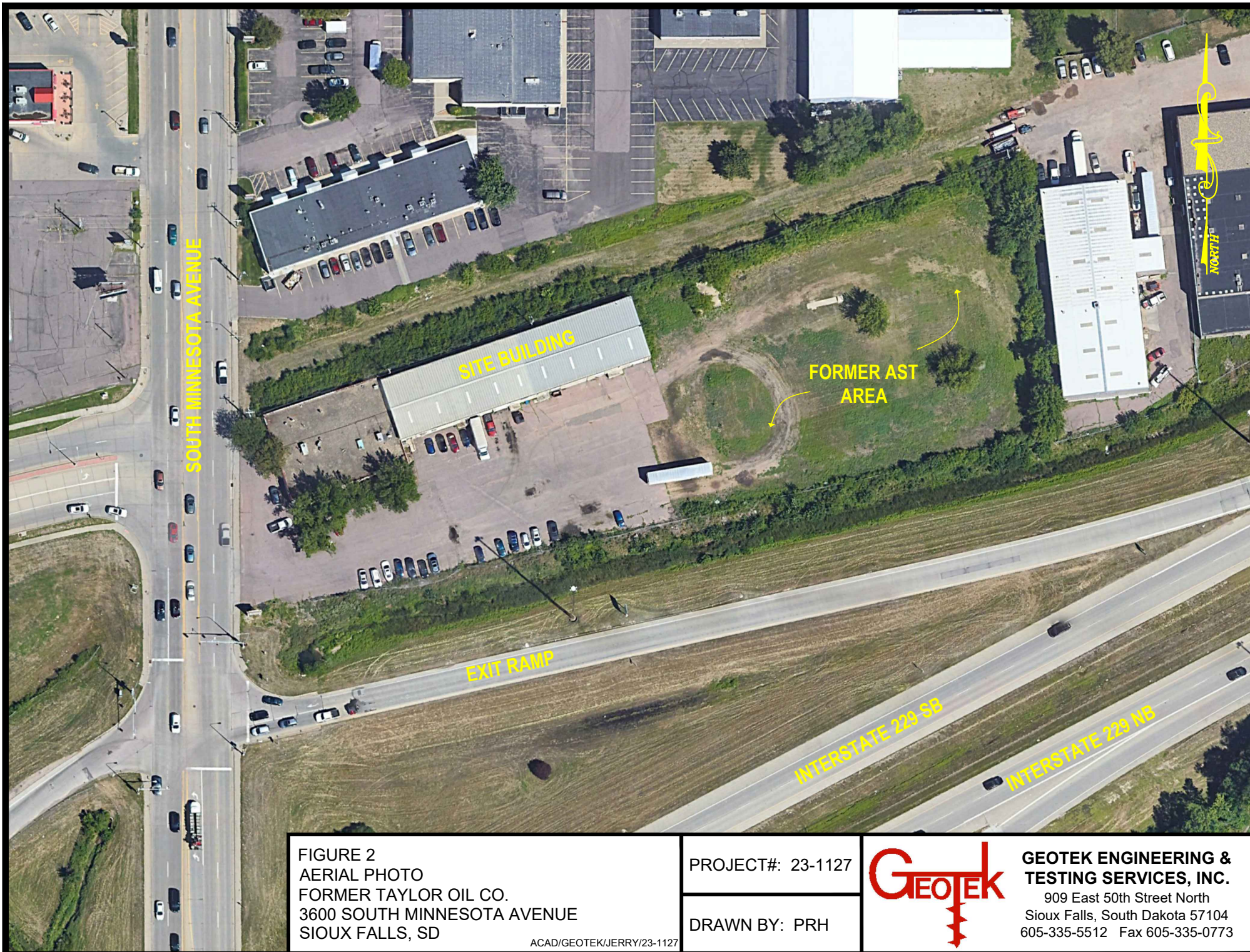


FIGURE 2
AERIAL PHOTO
FORMER TAYLOR OIL CO.
3600 SOUTH MINNESOTA AVENUE
SIOUX FALLS, SD

ACAD/GEOTEK/JERRY/23-1127

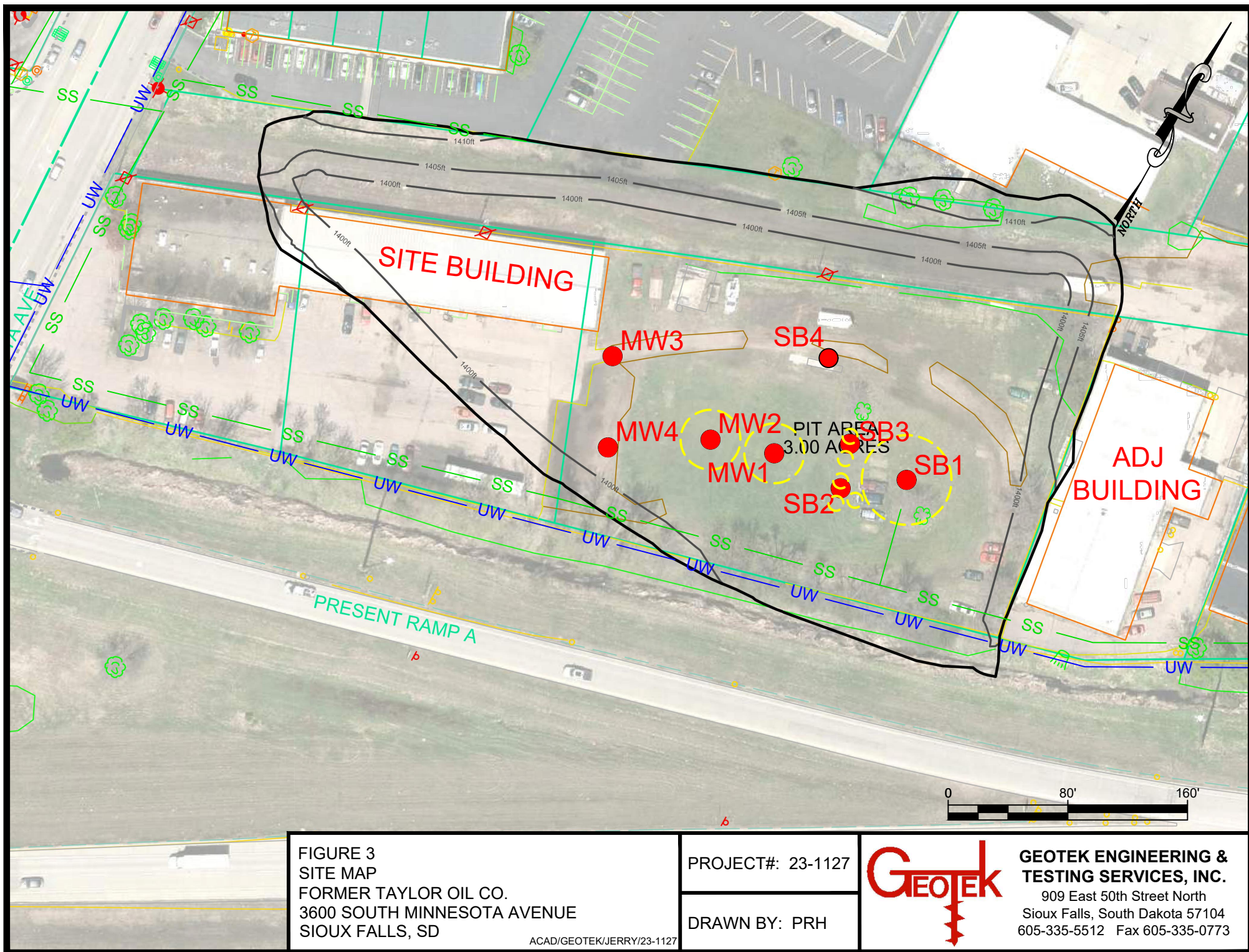
PROJECT#: 23-1127

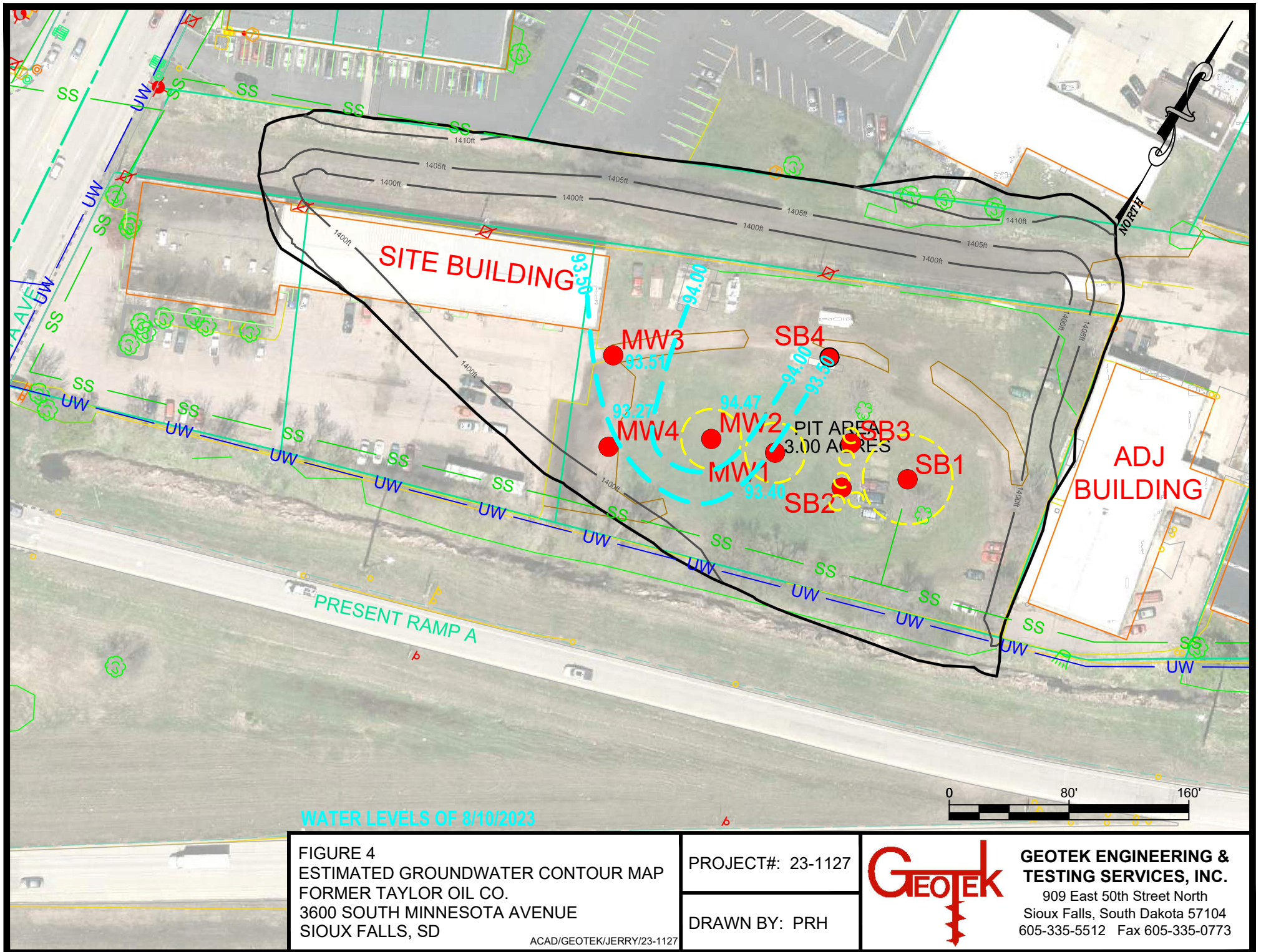
DRAWN BY: PRH



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APPENDIX A



**GEOTEK ENGINEERING
& TESTING SERVICES, INC.**
909 E. 50th Street North
Sioux Falls, SD 57104
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info@geotekeng.com

ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127					BORING / WELL NO. 1 (1 of 1)			Well Construction Details
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD								
DEPTH in FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE			
	↓ SURFACE ELEVATION <u>101.2 ft</u>				NO.	TYPE		
	FILL, MOSTLY CLAY: a trace of gravel, brown and black, moist	FILL	ND			HSA		
4½			ND		2	SS		
	SANDY LEAN CLAY: dark brown, moist, (CL)	MIXED ALLUVIUM	ND		3	SS		
6½	Refusal at 6½ feet. Bottom of borehole at 6½ feet.							
WATER LEVEL MEASUREMENTS					START <u>8-4-23</u> COMPLETE <u>8-4-23 8:45 am</u>			
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD			
		SURFACE	TOR / TOC		3.25" ID Hollow Stem Auger			
8-4-23	8:45 am	--	--	--				
--	--	--	--	--				
--	--	--	--	--				
--	--	--	--	--	CREW CHIEF Roy Hanson			

ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23



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& TESTING SERVICES, INC.**
909 E. 50th Street North
Sioux Falls, SD 57104
605-335-5512 Fax 605-335-0773
info@geotekeng.com

ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127				BORING / WELL NO. 2 (1 of 1)				Well Construction Details																																											
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD																																																			
DEPTH in FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>102.0 ft</u>	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE																																														
					NO.	TYPE																																													
	FILL, MOSTLY CLAY: a little gravel, brown and black, dry to moist	FILL	ND		1	HSA																																													
			ND		2	SS																																													
			ND		3	SS																																													
			ND		4	SS																																													
9½	LEAN CLAY WITH SAND: brown, moist, (CL)	MIXED ALLUVIUM	89		5	SS																																													
11.4	Refusal at 11.4 feet. Bottom of borehole at 11.4 feet.																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align:center;">WATER LEVEL MEASUREMENTS</td> <td>START <u>8-4-23</u></td> <td>COMPLETE <u>8-4-23 9:20 am</u></td> </tr> <tr> <td rowspan="2">DATE</td> <td rowspan="2">TIME</td> <td colspan="2">DEPTH BELOW</td> <td rowspan="2">WATER ELEVATION</td> <td colspan="2" rowspan="2">METHOD 3.25" ID Hollow Stem Auger</td> </tr> <tr> <td>SURFACE</td> <td>TOR / TOC</td> </tr> <tr> <td>8-4-23</td> <td>9:20 am</td> <td>--</td> <td>--</td> <td>--</td> <td colspan="2"></td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td colspan="2"></td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td colspan="2"></td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td colspan="2">CREW CHIEF Roy Hanson</td> </tr> </table>								WATER LEVEL MEASUREMENTS					START <u>8-4-23</u>	COMPLETE <u>8-4-23 9:20 am</u>	DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD 3.25" ID Hollow Stem Auger		SURFACE	TOR / TOC	8-4-23	9:20 am	--	--	--			--	--	--	--	--			--	--	--	--	--			--	--	--	--	--	CREW CHIEF Roy Hanson	
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ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23



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ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127					BORING / WELL NO. 3 (1 of 1)			Well Construction Details
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD								
DEPTH in FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE			
	↓ SURFACE ELEVATION <u>102.3 ft</u>				NO.	TYPE		
	FILL, MOSTLY CLAY: a little gravel, brown and black, moist	FILL	ND		1	HSA		
4½			ND		2	SS		
	SANDY LEAN CLAY: dark brown, moist, (CL)	MIXED ALLUVIUM	ND		3	SS		
7								
	SAND: a little gravel, fine to medium grained, brown, dry, a lens of clay above 8.4' (SP)	COARSE ALLUVIUM	2.0		4	SS		
8.4								
	Refusal at 8.4 feet. Bottom of borehole at 8.4 feet.							
WATER LEVEL MEASUREMENTS				START <u>8-4-23</u> COMPLETE <u>8-4-23 10:00 am</u>				
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD			
		SURFACE	TOR / TOC					
8-4-23	10:00 am	--	--	--	3.25" ID Hollow Stem Auger			
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					CREW CHIEF Roy Hanson			

ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23

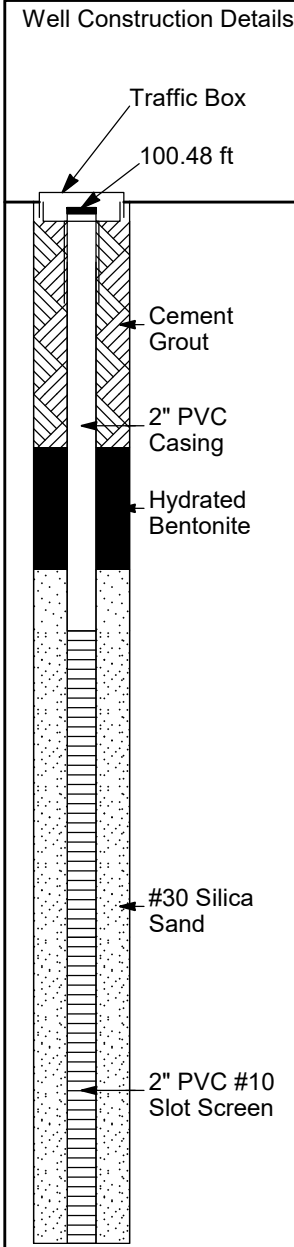
GEOTEK # <u>23-1127</u>						BORING / WELL NO. <u>4 (1 of 1)</u>						Well Construction Details							
PROJECT <u>Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD</u>																			
DEPTH in FEET	DESCRIPTION OF MATERIAL					GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE										
									NO.	TYPE									
	SURFACE ELEVATION <u>100.5 ft</u>																		
1.9	FILL, MOSTLY SAND: a little gravel, fine to medium grained, brown, dry					FILL	ND		1		HSA								
	Refusal at 1.9 feet. Bottom of borehole at 1.9 feet.																		
WATER LEVEL MEASUREMENTS START <u>8-4-23</u> COMPLETE <u>8-4-23 10:10 am</u>																			
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD														
		SURFACE	TOR / TOC		3.25" ID Hollow Stem Auger														
8-4-23	10:10 am	--	--	--															
--	--	--	--	--															
--	--	--	--	--															
--	--	--	--	--	CREW CHIEF Roy Hanson														



**GEOTEK ENGINEERING
& TESTING SERVICES, INC.**
909 E. 50th Street North
Sioux Falls, SD 57104
605-335-5512 Fax 605-335-0773
info@geotekeng.com

ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127				BORING / WELL NO. MW-1 (1 of 1)				Well Construction Details	
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD									
DEPTH in FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>100.9 ft</u>	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE				
					NO.	TYPE			
4½	FILL, MOSTLY CLAY: a little gravel, brown and black, dry to moist	FILL	ND		1	HSA			
			ND	2	SS				
			3.0	3	SS				
9½	FILL, MOSTLY SAND: fine grained, pink, moist to waterbearing	FILL							
			121	4	SS				
12	FILL, MOSTLY CLAY: with gravel, brown, wet	FILL	68		5	SS			
19½	SAND: fine grained, brown, waterbearing, (SP)	COARSE ALLUVIUM	16		6	SS			
			47	7	SS				
			151	8	SS				
Bottom of borehole at 19½ feet.									
WATER LEVEL MEASUREMENTS				START	8-4-23		COMPLETE	8-4-23 11:30 am	
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD 3.25" ID Hollow Stem Auger				
		SURFACE	TOR / TOC						
8-10-23	11:30 am	7.5	7.08	93.40					
--	--	--	--	--					
--	--	--	--	--					
--	--	--	--	--	CREW CHIEF Roy Hanson				



ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23



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ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127				BORING / WELL NO. MW-2 (1 of 1)				Well Construction Details																															
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD																																							
DEPTH in FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE																																		
	SURFACE ELEVATION <u>100.4 ft</u>				NO.	TYPE																																	
2½	FILL, MOSTLY CLAY: brown, dry	FILL	ND		1	HSA																																	
	FILL, MOSTLY SAND: fine grained, pink, moist to waterbearing	FILL	1.3		2	SS																																	
			17	▼	3	SS																																	
			2.2		4	SS																																	
9½	SAND: with gravel, fine to medium grained, brown, waterbearing, (SP)	COARSE ALLUVIUM	ND		5	SS																																	
12.6	Refusal at 12.6 feet. Bottom of borehole at 12.6 feet.		ND		6	SS																																	
WATER LEVEL MEASUREMENTS <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th rowspan="2">DATE</th> <th rowspan="2">TIME</th> <th colspan="2">DEPTH BELOW</th> <th rowspan="2">WATER ELEVATION</th> <th rowspan="2">METHOD</th> </tr> <tr> <th>SURFACE</th> <th>TOR / TOC</th> </tr> <tr> <td>8-10-23</td> <td>11:55 am</td> <td>5.9</td> <td>5.49</td> <td>▼ 94.47</td> <td>3.25" ID Hollow Stem Auger</td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td></td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td></td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td></td> </tr> </table> START <u>8-4-23</u> COMPLETE <u>8-4-23 12:30 pm</u> CREW CHIEF <u>Roy Hanson</u>								DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD	SURFACE	TOR / TOC	8-10-23	11:55 am	5.9	5.49	▼ 94.47	3.25" ID Hollow Stem Auger	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD																																		
		SURFACE	TOR / TOC																																				
8-10-23	11:55 am	5.9	5.49	▼ 94.47	3.25" ID Hollow Stem Auger																																		
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ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23



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ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127				BORING / WELL NO. MW-3 (1 of 1)				Well Construction Details	
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD									
DEPTH in FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>99.5 ft</u>	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE				
					NO.	TYPE			
2	FILL, MOSTLY SAND: a little gravel, fine to medium grained, brown, dry	FILL	ND		1	HSA			
	FILL, MOSTLY CLAY: a little gravel, black, moist	FILL	93		2	SS			
9½	LEAN CLAY WITH SAND: a trace of gravel, brown, moist, a lens of sand above 13.5' (CL)	GLACIAL TILL	27	▼	3	SS			
					4	SS			
					5	SS			
14½	SAND: fine grained, brown, waterbearing, (SP)	COARSE ALLUVIUM	6.0		6	SS			
					7	SS			
					8	SS			
19½	Bottom of borehole at 19½ feet.								
WATER LEVEL MEASUREMENTS				START <u>8-4-23</u> COMPLETE <u>8-4-23 2:20 pm</u>					
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD				
		SURFACE	TOR / TOC						
8-10-23	11:50 am	6.0	5.53	▼ 93.51	3.25" ID Hollow Stem Auger				
--	--	--	--	--					
--	--	--	--	--					
--	--	--	--	--	CREW CHIEF Roy Hanson				

ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23



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ENVIRONMENTAL SOIL BORING LOG / WELL CONSTRUCTION INFORMATION

GEOTEK # 23-1127		BORING / WELL NO. MW-4 (1 of 1)		Well Construction Details		
PROJECT Former Taylor Oil Co., 3600 S. Minnesota Ave, Sioux Falls, SD						
DEPTH in FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>99.5 ft</u>	GEOLOGIC ORIGIN	PID / FID	WL	SAMPLE	
					NO.	TYPE
2	FILL, MOSTLY SAND: a little gravel, fine to medium grained, brown, dry, (SP)	FILL	ND		1	HSA
	FILL, MOSTLY CLAY: a trace of gravel, black, moist	FILL	23		2	SS
			5.0	▼	3	SS
			42		4	SS
9½	LEAN CLAY WITH SAND: a little gravel, brown, moist, (CL)	MIXED ALLUVIUM	49		5	SS
12	SILTY SAND: fine grained, brown, wet, (SM)	MIXED ALLUVIUM	4.0		6	SS
14½	LEAN CLAY WITH SAND: a little gravel, brown, moist, (CL)	MIXED ALLUVIUM	10		7	SS
			4.7		8	SS
19½	Bottom of borehole at 19½ feet.					

Traffic Box

98.95 ft

Cement Grout

2" PVC Casing

Hydrated Bentonite

#30 Silica Sand

2" PVC #10 Slot Screen

WATER LEVEL MEASUREMENTS				START <u>8-4-23</u>	COMPLETE <u>8-4-23 3:20 pm</u>
DATE	TIME	DEPTH BELOW		WATER ELEVATION	METHOD
		SURFACE	TOR / TOC		
8-10-23	11:35 am	6.2	5.68	▼ 93.27	3.25" ID Hollow Stem Auger
--	--	--	--	--	
--	--	--	--	--	
--	--	--	--	--	CREW CHIEF Roy Hanson

ENVIRONMENTAL WELL LOG 23-1127.GPJ GEOTEKENG.GDT 8/25/23

APPENDIX B

ANALYTICAL REPORT

PREPARED FOR

Attn: Jerry Zutz
GeoTek Engineering & Testing Services
909 E. 50th Street
Sioux Falls, South Dakota 57104

Generated 8/17/2023 11:14:00 AM

JOB DESCRIPTION

Former Taylor Oil Co
SDG NUMBER 23-1127

JOB NUMBER

310-262032-1

Eurofins Cedar Falls

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
8/17/2023 11:14:00 AM

Authorized for release by
Conner Calhoun, Project Management Assistant I
Conner.Calhoun@et.eurofinsus.com
(319)277-2401

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Case Narrative

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Job ID: 310-262032-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative 310-262032-1

Receipt

The samples were received on 8/8/2023 8:55 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.8°C

Hydrocarbons

Method OA1: Surrogate recovery for the following sample was outside control limits: MW3 (7-9.5') (310-262032-6). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

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

Diesel Range Organics

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

Sample Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-262032-1	SB1 (4.5-6.5')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-2	SB2 (9.5-11.4')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-3	SB3 (7-8.4')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-4	MW1 (17-19.5')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-5	MW2 (4.5-7')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-6	MW3 (7-9.5')	Solid	08/04/23 00:00	08/08/23 08:55
310-262032-7	MW4 (9.5-12')	Solid	08/04/23 00:00	08/08/23 08:55

Detection Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: SB1 (4.5-6.5')

Lab Sample ID: 310-262032-1

No Detections.

Client Sample ID: SB2 (9.5-11.4')

Lab Sample ID: 310-262032-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.238		0.0980		mg/Kg	1		OA-1 (GC)	Total/NA
Xylenes, Total	0.633		0.294		mg/Kg	1		OA-1 (GC)	Total/NA
TPH (as Gasoline)	61.2		9.80		mg/Kg	1		OA-1 (GC)	Total/NA
Diesel	193		9.57		mg/Kg	1		OA-2	Total/NA
Naphthalene	1.63		0.957		mg/Kg	1		OA-2	Total/NA

Client Sample ID: SB3 (7-8.4')

Lab Sample ID: 310-262032-3

No Detections.

Client Sample ID: MW1 (17-19.5')

Lab Sample ID: 310-262032-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TPH (as Gasoline)	18.0		9.10		mg/Kg	1		OA-1 (GC)	Total/NA
Diesel	32.7		9.57		mg/Kg	1		OA-2	Total/NA

Client Sample ID: MW2 (4.5-7')

Lab Sample ID: 310-262032-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TPH (as Gasoline)	59.3		9.58		mg/Kg	1		OA-1 (GC)	Total/NA
Diesel	39.2		9.63		mg/Kg	1		OA-2	Total/NA

Client Sample ID: MW3 (7-9.5')

Lab Sample ID: 310-262032-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.861		0.0987		mg/Kg	1		OA-1 (GC)	Total/NA
Ethylbenzene	7.55		0.0987		mg/Kg	1		OA-1 (GC)	Total/NA
Xylenes, Total	9.20		0.296		mg/Kg	1		OA-1 (GC)	Total/NA
TPH (as Gasoline)	58.9		9.87		mg/Kg	1		OA-1 (GC)	Total/NA
Methyl tert-butyl ether	0.305		0.0987		mg/Kg	1		OA-1 (GC)	Total/NA
Gasoline	1620		9.87		mg/Kg	1		OA-2	Total/NA
Diesel	613		9.87		mg/Kg	1		OA-2	Total/NA
Naphthalene	9.51		1.97		mg/Kg	2		OA-2	Total/NA

Client Sample ID: MW4 (9.5-12')

Lab Sample ID: 310-262032-7

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: SB1 (4.5-6.5')

Lab Sample ID: 310-262032-1

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0990	F1 F2	0.0990		mg/Kg		08/09/23 09:30	08/09/23 12:13	1
Toluene	<0.0990	F1 F2	0.0990		mg/Kg		08/09/23 09:30	08/09/23 12:13	1
Ethylbenzene	<0.0990		0.0990		mg/Kg		08/09/23 09:30	08/09/23 12:13	1
Xylenes, Total	<0.297	F2	0.297		mg/Kg		08/09/23 09:30	08/09/23 12:13	1
TPH (as Gasoline)	<9.90		9.90		mg/Kg		08/09/23 09:30	08/09/23 12:13	1
Methyl tert-butyl ether	<0.0990		0.0990		mg/Kg		08/09/23 09:30	08/09/23 12:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		56 - 150	08/09/23 09:30	08/09/23 12:13	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.72		9.72		mg/Kg		08/09/23 07:23	08/14/23 20:47	1
Diesel	<9.72		9.72		mg/Kg		08/09/23 07:23	08/14/23 20:47	1
Waste Oil	<9.72		9.72		mg/Kg		08/09/23 07:23	08/14/23 20:47	1
Naphthalene	<0.972		0.972		mg/Kg		08/09/23 07:23	08/14/23 20:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	83		12 - 126	08/09/23 07:23	08/14/23 20:47	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: SB2 (9.5-11.4')

Lab Sample ID: 310-262032-2

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0980		0.0980		mg/Kg		08/09/23 09:30	08/09/23 17:02	1
Toluene	<0.0980		0.0980		mg/Kg		08/09/23 09:30	08/09/23 17:02	1
Ethylbenzene	0.238		0.0980		mg/Kg		08/09/23 09:30	08/09/23 17:02	1
Xylenes, Total	0.633		0.294		mg/Kg		08/09/23 09:30	08/09/23 17:02	1
TPH (as Gasoline)	61.2		9.80		mg/Kg		08/09/23 09:30	08/09/23 17:02	1
Methyl tert-butyl ether	<0.0980		0.0980		mg/Kg		08/09/23 09:30	08/09/23 17:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		56 - 150	08/09/23 09:30	08/09/23 17:02	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.57		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:02	1
Diesel	193		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:02	1
Waste Oil	<9.57		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:02	1
Naphthalene	1.63		0.957		mg/Kg		08/09/23 07:23	08/14/23 21:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	74		12 - 126	08/09/23 07:23	08/14/23 21:02	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: SB3 (7-8.4')

Lab Sample ID: 310-262032-3

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0988		0.0988		mg/Kg		08/09/23 09:30	08/09/23 12:42	1
Toluene	<0.0988		0.0988		mg/Kg		08/09/23 09:30	08/09/23 12:42	1
Ethylbenzene	<0.0988		0.0988		mg/Kg		08/09/23 09:30	08/09/23 12:42	1
Xylenes, Total	<0.296		0.296		mg/Kg		08/09/23 09:30	08/09/23 12:42	1
TPH (as Gasoline)	<9.88		9.88		mg/Kg		08/09/23 09:30	08/09/23 12:42	1
Methyl tert-butyl ether	<0.0988		0.0988		mg/Kg		08/09/23 09:30	08/09/23 12:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		56 - 150	08/09/23 09:30	08/09/23 12:42	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.67		9.67		mg/Kg		08/09/23 07:23	08/14/23 21:17	1
Diesel	<9.67		9.67		mg/Kg		08/09/23 07:23	08/14/23 21:17	1
Waste Oil	<9.67		9.67		mg/Kg		08/09/23 07:23	08/14/23 21:17	1
Naphthalene	<0.967		0.967		mg/Kg		08/09/23 07:23	08/14/23 21:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	62		12 - 126	08/09/23 07:23	08/14/23 21:17	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: MW1 (17-19.5')

Lab Sample ID: 310-262032-4

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0910		0.0910		mg/Kg		08/09/23 09:30	08/09/23 13:11	1
Toluene	<0.0910		0.0910		mg/Kg		08/09/23 09:30	08/09/23 13:11	1
Ethylbenzene	<0.0910		0.0910		mg/Kg		08/09/23 09:30	08/09/23 13:11	1
Xylenes, Total	<0.273		0.273		mg/Kg		08/09/23 09:30	08/09/23 13:11	1
TPH (as Gasoline)	18.0		9.10		mg/Kg		08/09/23 09:30	08/09/23 13:11	1
Methyl tert-butyl ether	<0.0910		0.0910		mg/Kg		08/09/23 09:30	08/09/23 13:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		56 - 150	08/09/23 09:30	08/09/23 13:11	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.57		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:32	1
Diesel	32.7		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:32	1
Waste Oil	<9.57		9.57		mg/Kg		08/09/23 07:23	08/14/23 21:32	1
Naphthalene	<0.957		0.957		mg/Kg		08/09/23 07:23	08/14/23 21:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	106		12 - 126	08/09/23 07:23	08/14/23 21:32	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: MW2 (4.5-7')

Lab Sample ID: 310-262032-5

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0958		0.0958		mg/Kg		08/09/23 09:30	08/09/23 16:33	1
Toluene	<0.0958		0.0958		mg/Kg		08/09/23 09:30	08/09/23 16:33	1
Ethylbenzene	<0.0958		0.0958		mg/Kg		08/09/23 09:30	08/09/23 16:33	1
Xylenes, Total	<0.287		0.287		mg/Kg		08/09/23 09:30	08/09/23 16:33	1
TPH (as Gasoline)	59.3		9.58		mg/Kg		08/09/23 09:30	08/09/23 16:33	1
Methyl tert-butyl ether	<0.0958		0.0958		mg/Kg		08/09/23 09:30	08/09/23 16:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		56 - 150	08/09/23 09:30	08/09/23 16:33	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.63		9.63		mg/Kg		08/09/23 07:23	08/14/23 21:46	1
Diesel	39.2		9.63		mg/Kg		08/09/23 07:23	08/14/23 21:46	1
Waste Oil	<9.63		9.63		mg/Kg		08/09/23 07:23	08/14/23 21:46	1
Naphthalene	<0.963		0.963		mg/Kg		08/09/23 07:23	08/14/23 21:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	89		12 - 126	08/09/23 07:23	08/14/23 21:46	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: MW3 (7-9.5')

Lab Sample ID: 310-262032-6

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.861		0.0987		mg/Kg		08/09/23 09:30	08/09/23 17:30	1
Toluene	<0.0987		0.0987		mg/Kg		08/09/23 09:30	08/09/23 17:30	1
Ethylbenzene	7.55		0.0987		mg/Kg		08/09/23 09:30	08/09/23 17:30	1
Xylenes, Total	9.20		0.296		mg/Kg		08/09/23 09:30	08/09/23 17:30	1
TPH (as Gasoline)	58.9		9.87		mg/Kg		08/10/23 10:01	08/12/23 02:41	1
Methyl tert-butyl ether	0.305		0.0987		mg/Kg		08/09/23 09:30	08/09/23 17:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	154	S1+	56 - 150				08/09/23 09:30	08/09/23 17:30	1
4-Bromofluorobenzene (Surr)	107		56 - 150				08/10/23 10:01	08/12/23 02:41	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	1620		9.87		mg/Kg		08/09/23 07:23	08/14/23 22:01	1
Diesel	613		9.87		mg/Kg		08/09/23 07:23	08/14/23 22:01	1
Waste Oil	<9.87		9.87		mg/Kg		08/09/23 07:23	08/14/23 22:01	1
Naphthalene	9.51		1.97		mg/Kg		08/09/23 07:23	08/15/23 18:06	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
n-Octacosane	93		12 - 126				08/09/23 07:23	08/14/23 22:01	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: MW4 (9.5-12')

Lab Sample ID: 310-262032-7

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0981		0.0981		mg/Kg		08/09/23 09:30	08/09/23 13:40	1
Toluene	<0.0981		0.0981		mg/Kg		08/09/23 09:30	08/09/23 13:40	1
Ethylbenzene	<0.0981		0.0981		mg/Kg		08/09/23 09:30	08/09/23 13:40	1
Xylenes, Total	<0.294		0.294		mg/Kg		08/09/23 09:30	08/09/23 13:40	1
TPH (as Gasoline)	<9.81		9.81		mg/Kg		08/09/23 09:30	08/09/23 13:40	1
Methyl tert-butyl ether	<0.0981		0.0981		mg/Kg		08/09/23 09:30	08/09/23 13:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		56 - 150	08/09/23 09:30	08/09/23 13:40	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<9.44		9.44		mg/Kg		08/09/23 07:23	08/14/23 22:15	1
Diesel	<9.44		9.44		mg/Kg		08/09/23 07:23	08/14/23 22:15	1
Waste Oil	<9.44		9.44		mg/Kg		08/09/23 07:23	08/14/23 22:15	1
Naphthalene	<0.944		0.944		mg/Kg		08/09/23 07:23	08/14/23 22:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	72		12 - 126	08/09/23 07:23	08/14/23 22:15	1

Definitions/Glossary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Qualifiers

GC VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

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

Surrogate Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	BFB (56-150)
310-262032-1	SB1 (4.5-6.5')	95
310-262032-1 MS	SB1 (4.5-6.5')	95
310-262032-1 MSD	SB1 (4.5-6.5')	93
310-262032-2	SB2 (9.5-11.4')	95
310-262032-3	SB3 (7-8.4')	95
310-262032-4	MW1 (17-19.5')	94
310-262032-5	MW2 (4.5-7')	97
310-262032-6	MW3 (7-9.5')	154 S1+
310-262032-6	MW3 (7-9.5')	107
310-262032-7	MW4 (9.5-12')	94
LCS 310-396043/2-A	Lab Control Sample	98
LCS 310-396181/2-A	Lab Control Sample	101
LCS 310-396181/3-A	Lab Control Sample	136
MB 310-396043/1-A	Method Blank	97
MB 310-396181/1-A	Method Blank	99
Surrogate Legend		
BFB = 4-Bromofluorobenzene (Surr)		

Method: OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	OTCN (12-126)
310-262032-1	SB1 (4.5-6.5')	83
310-262032-1 MS	SB1 (4.5-6.5')	81
310-262032-1 MSD	SB1 (4.5-6.5')	77
310-262032-2	SB2 (9.5-11.4')	74
310-262032-3	SB3 (7-8.4')	62
310-262032-4	MW1 (17-19.5')	106
310-262032-5	MW2 (4.5-7')	89
310-262032-6	MW3 (7-9.5')	93
310-262032-7	MW4 (9.5-12')	72
Surrogate Legend		
OTCN = n-Octacosane		

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 310-396043/1-A

Matrix: Solid

Analysis Batch: 396048

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 396043

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0928		0.0928		mg/Kg		08/09/23 09:30	08/09/23 10:47	1
Toluene	<0.0928		0.0928		mg/Kg		08/09/23 09:30	08/09/23 10:47	1
Ethylbenzene	<0.0928		0.0928		mg/Kg		08/09/23 09:30	08/09/23 10:47	1
Xylenes, Total	<0.278		0.278		mg/Kg		08/09/23 09:30	08/09/23 10:47	1
TPH (as Gasoline)	<9.28		9.28		mg/Kg		08/09/23 09:30	08/09/23 10:47	1
Methyl tert-butyl ether	<0.0928		0.0928		mg/Kg		08/09/23 09:30	08/09/23 10:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		56 - 150	08/09/23 09:30	08/09/23 10:47	1

Lab Sample ID: LCS 310-396043/2-A

Matrix: Solid

Analysis Batch: 396048

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396043

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	1.89	1.948		mg/Kg		103	76 - 130
Toluene	1.89	1.961		mg/Kg		104	78 - 129
Ethylbenzene	1.89	2.021		mg/Kg		107	77 - 128
Xylenes, Total	5.67	5.906		mg/Kg		104	78 - 131
Methyl tert-butyl ether	1.89	1.970		mg/Kg		104	73 - 141

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		56 - 150

Lab Sample ID: LCS 310-396043/3-A

Matrix: Solid

Analysis Batch: 396048

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396043

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TPH (as Gasoline)	47.3	51.84		mg/Kg		110	64 - 127

Lab Sample ID: 310-262032-1 MS

Matrix: Solid

Analysis Batch: 396048

Client Sample ID: SB1 (4.5-6.5')

Prep Type: Total/NA

Prep Batch: 396043

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	<0.0990	F1 F2	1.96	1.509		mg/Kg		77	63 - 137
Toluene	<0.0990	F1 F2	1.96	1.525		mg/Kg		78	64 - 138
Ethylbenzene	<0.0990		1.96	1.553		mg/Kg		79	60 - 141
Xylenes, Total	<0.297	F2	5.89	4.542		mg/Kg		77	58 - 145
Methyl tert-butyl ether	<0.0990		1.96	1.280		mg/Kg		65	61 - 147

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	95		56 - 150

Eurofins Cedar Falls

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 310-262032-1 MSD

Matrix: Solid

Analysis Batch: 396048

Client Sample ID: SB1 (4.5-6.5')

Prep Type: Total/NA

Prep Batch: 396043

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	<0.0990	F1 F2	1.97	1.205	F1 F2	mg/Kg		61	63 - 137	22	20
Toluene	<0.0990	F1 F2	1.97	1.202	F1 F2	mg/Kg		61	64 - 138	24	20
Ethylbenzene	<0.0990		1.97	1.219		mg/Kg		62	60 - 141	24	24
Xylenes, Total	<0.297	F2	5.92	3.546	F2	mg/Kg		60	58 - 145	25	23
Methyl tert-butyl ether	<0.0990		1.97	1.205		mg/Kg		61	61 - 147	6	33

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	93		56 - 150

Lab Sample ID: MB 310-396181/1-A

Matrix: Solid

Analysis Batch: 396339

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 396181

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.0922		0.0922		mg/Kg		08/10/23 10:01	08/11/23 16:34	1
Toluene	<0.0922		0.0922		mg/Kg		08/10/23 10:01	08/11/23 16:34	1
Ethylbenzene	<0.0922		0.0922		mg/Kg		08/10/23 10:01	08/11/23 16:34	1
Xylenes, Total	<0.277		0.277		mg/Kg		08/10/23 10:01	08/11/23 16:34	1
TPH (as Gasoline)	<9.22		9.22		mg/Kg		08/10/23 10:01	08/11/23 16:34	1
Methyl tert-butyl ether	<0.0922		0.0922		mg/Kg		08/10/23 10:01	08/11/23 16:34	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		56 - 150	08/10/23 10:01	08/11/23 16:34	1

Lab Sample ID: LCS 310-396181/2-A

Matrix: Solid

Analysis Batch: 396339

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396181

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	1.97	1.635		mg/Kg		83	76 - 130
Toluene	1.97	1.656		mg/Kg		84	78 - 129
Ethylbenzene	1.97	1.709		mg/Kg		87	77 - 128
Xylenes, Total	5.90	4.914		mg/Kg		83	78 - 131
Methyl tert-butyl ether	1.97	1.664		mg/Kg		85	73 - 141

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		56 - 150

Lab Sample ID: LCS 310-396181/3-A

Matrix: Solid

Analysis Batch: 396339

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396181

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TPH (as Gasoline)	47.3	32.54		mg/Kg		69	64 - 127

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	136		56 - 150

Eurofins Cedar Falls

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Method: OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: 310-262032-1 MS

Matrix: Solid

Analysis Batch: 396474

Client Sample ID: SB1 (4.5-6.5')

Prep Type: Total/NA

Prep Batch: 395998

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel	<9.72		127	82.97		mg/Kg		65	12 - 147		
Surrogate	MS %Recovery	MS Qualifier	MS Limits								
n-Octacosane	81		12 - 126								

Lab Sample ID: 310-262032-1 MSD

Matrix: Solid

Analysis Batch: 396474

Client Sample ID: SB1 (4.5-6.5')

Prep Type: Total/NA

Prep Batch: 395998

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel	<9.72		128	80.71		mg/Kg		63	12 - 147	3	40
Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits								
n-Octacosane	77		12 - 126								

QC Association Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

GC VOA

Prep Batch: 396043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-1	SB1 (4.5-6.5')	Total/NA	Solid	5035	
310-262032-2	SB2 (9.5-11.4')	Total/NA	Solid	5035	
310-262032-3	SB3 (7-8.4')	Total/NA	Solid	5035	
310-262032-4	MW1 (17-19.5')	Total/NA	Solid	5035	
310-262032-5	MW2 (4.5-7')	Total/NA	Solid	5035	
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	5035	
310-262032-7	MW4 (9.5-12')	Total/NA	Solid	5035	
MB 310-396043/1-A	Method Blank	Total/NA	Solid	5035	
LCS 310-396043/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCS 310-396043/3-A	Lab Control Sample	Total/NA	Solid	5035	
310-262032-1 MS	SB1 (4.5-6.5')	Total/NA	Solid	5035	
310-262032-1 MSD	SB1 (4.5-6.5')	Total/NA	Solid	5035	

Analysis Batch: 396048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-1	SB1 (4.5-6.5')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-2	SB2 (9.5-11.4')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-3	SB3 (7-8.4')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-4	MW1 (17-19.5')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-5	MW2 (4.5-7')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-7	MW4 (9.5-12')	Total/NA	Solid	OA-1 (GC)	396043
MB 310-396043/1-A	Method Blank	Total/NA	Solid	OA-1 (GC)	396043
LCS 310-396043/2-A	Lab Control Sample	Total/NA	Solid	OA-1 (GC)	396043
LCS 310-396043/3-A	Lab Control Sample	Total/NA	Solid	OA-1 (GC)	396043
310-262032-1 MS	SB1 (4.5-6.5')	Total/NA	Solid	OA-1 (GC)	396043
310-262032-1 MSD	SB1 (4.5-6.5')	Total/NA	Solid	OA-1 (GC)	396043

Prep Batch: 396181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	5035	
MB 310-396181/1-A	Method Blank	Total/NA	Solid	5035	
LCS 310-396181/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCS 310-396181/3-A	Lab Control Sample	Total/NA	Solid	5035	

Analysis Batch: 396339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	OA-1 (GC)	396181
MB 310-396181/1-A	Method Blank	Total/NA	Solid	OA-1 (GC)	396181
LCS 310-396181/2-A	Lab Control Sample	Total/NA	Solid	OA-1 (GC)	396181
LCS 310-396181/3-A	Lab Control Sample	Total/NA	Solid	OA-1 (GC)	396181

GC Semi VOA

Prep Batch: 395998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-1	SB1 (4.5-6.5')	Total/NA	Solid	3546	
310-262032-2	SB2 (9.5-11.4')	Total/NA	Solid	3546	
310-262032-3	SB3 (7-8.4')	Total/NA	Solid	3546	
310-262032-4	MW1 (17-19.5')	Total/NA	Solid	3546	
310-262032-5	MW2 (4.5-7')	Total/NA	Solid	3546	

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QC Association Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

GC Semi VOA (Continued)

Prep Batch: 395998 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	3546	
310-262032-7	MW4 (9.5-12')	Total/NA	Solid	3546	
310-262032-1 MS	SB1 (4.5-6.5')	Total/NA	Solid	3546	
310-262032-1 MSD	SB1 (4.5-6.5')	Total/NA	Solid	3546	

Analysis Batch: 396474

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-1	SB1 (4.5-6.5')	Total/NA	Solid	OA-2	395998
310-262032-2	SB2 (9.5-11.4')	Total/NA	Solid	OA-2	395998
310-262032-3	SB3 (7-8.4')	Total/NA	Solid	OA-2	395998
310-262032-4	MW1 (17-19.5')	Total/NA	Solid	OA-2	395998
310-262032-5	MW2 (4.5-7')	Total/NA	Solid	OA-2	395998
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	OA-2	395998
310-262032-7	MW4 (9.5-12')	Total/NA	Solid	OA-2	395998
310-262032-1 MS	SB1 (4.5-6.5')	Total/NA	Solid	OA-2	395998
310-262032-1 MSD	SB1 (4.5-6.5')	Total/NA	Solid	OA-2	395998

Analysis Batch: 396598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262032-6	MW3 (7-9.5')	Total/NA	Solid	OA-2	395998

Lab Chronicle

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Client Sample ID: SB1 (4.5-6.5')

Lab Sample ID: 310-262032-1

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 12:13
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 20:47

Client Sample ID: SB2 (9.5-11.4')

Lab Sample ID: 310-262032-2

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 17:02
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 21:02

Client Sample ID: SB3 (7-8.4')

Lab Sample ID: 310-262032-3

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 12:42
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 21:17

Client Sample ID: MW1 (17-19.5')

Lab Sample ID: 310-262032-4

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 13:11
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 21:32

Client Sample ID: MW2 (4.5-7')

Lab Sample ID: 310-262032-5

Date Collected: 08/04/23 00:00

Matrix: Solid

Date Received: 08/08/23 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 16:33
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 21:46

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Lab Chronicle

Client: GeoTek Engineering & Testing Services
 Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
 SDG: 23-1127

Client Sample ID: MW3 (7-9.5')
Date Collected: 08/04/23 00:00
Date Received: 08/08/23 08:55

Lab Sample ID: 310-262032-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 17:30
Total/NA	Prep	5035			396181	MZR8	EET CF	08/10/23 10:01
Total/NA	Analysis	OA-1 (GC)		1	396339	MZR8	EET CF	08/12/23 02:41
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 22:01
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		2	396598	C3AA	EET CF	08/15/23 18:06

Client Sample ID: MW4 (9.5-12')
Date Collected: 08/04/23 00:00
Date Received: 08/08/23 08:55

Lab Sample ID: 310-262032-7
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			396043	MZR8	EET CF	08/09/23 09:30
Total/NA	Analysis	OA-1 (GC)		1	396048	MZR8	EET CF	08/09/23 13:40
Total/NA	Prep	3546			395998	DZK8	EET CF	08/09/23 07:23
Total/NA	Analysis	OA-2		1	396474	C3AA	EET CF	08/14/23 22:15

Laboratory References:
 EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-23
Georgia	State	IA100001 (OR)	09-29-23
Illinois	NELAP	200024	11-29-23
Iowa	State	007	12-01-23
Kansas	NELAP	E-10341	01-31-24
Minnesota	NELAP	019-999-319	12-31-23
Minnesota (Petrofund)	State	3349	01-18-24
North Dakota	State	R-186	09-29-23
Oregon	NELAP	IA100001	09-29-23

Method Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Taylor Oil Co

Job ID: 310-262032-1
SDG: 23-1127

Method	Method Description	Protocol	Laboratory
OA-1 (GC)	Volatile Petroleum Hydrocarbons (GC)	Iowa DNR	EET CF
OA-2	Iowa - Extractable Petroleum Hydrocarbons (GC)	Iowa DNR	EET CF
3546	Microwave Extraction	SW846	EET CF
5035	Purge and Trap for Methanol Extractions	SW846	EET CF

Protocol References:

Iowa DNR = Iowa Department of Natural Resources

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



Environment Testing
America



310-262032 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Gretele</u>			
City/State:	CITY	STATE	Project:
		<u>SD</u>	
Receipt Information			
Date/Time Received:	DATE	TIME	Received By:
	<u>8/8/23</u>	<u>0855</u>	<u>SK</u>
Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		☒ Yes ☐ No	If yes: Cooler ID: _____
Multiple Coolers?		☐ Yes ☒ No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present?		☒ Yes ☐ No	If yes: Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?		☐ Yes ☒ No	If yes: Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?		☐ Yes ☒ No	If yes: Which VOA samples are in cooler? ↓
Temperature Record			
Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE			
Thermometer ID:		Correction Factor (°C):	
<u>P</u>		<u>0</u>	
Temp Blank Temperature: If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
<u>2.8</u>		<u>2.8</u>	
Sample Container Temperature			
Container(s) used:	CONTAINER 1		CONTAINER 2
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No a) If yes: Is there evidence that the chilling process began? ☐ Yes ☐ No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Cedar Falls IA 50613
phone 319 277 2401 fax 319 277 2425

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Eurofins Environment Testing America

Client Contact		Project Manager: Jerry Zutz		Site Contact:		Date: 8-7-23		COC No	
GeoTek Engineering & Testing Services, Inc.		Email: jzut@geotekeng.com		Lab Contact: Conner Calhoun		Carrier:		TALS Project #	
909 East 50th Street North		Tel/Fax: 605-335-5512/0773		Analysis Turnaround Time				Sampler	
Sioux Falls, SD 57104		☐ CALENDAR DAYS ☐ WORKING DAYS						For Lab Use Only	
605-335-5512		TAT if different from Below						Walk-in Client	
605-335-0773		☐ 2 weeks						Lab Sampling	
Project Name: Former Taylor Oil Co		☐ 1 week						Job / SDG No	
Site: 3600 S. Minnesota Ave, Sioux Falls, SD		☐ 2 days							
PO# 600 Tek # 23-1127		☐ 1 day							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrx	# of Cont.	Sample Specific Notes		
SB1 (4 1/2 - 6 1/2')	8-4-23	-	-	G	Sol	1			
SB2 (9 1/2 - 11.4')	"	-	-	"	"	1			
SB3 (7 - 8.4')	"	-	-	"	"	1			
MW1 (17 - 19 1/2')	"	-	-	"	"	1			
MW2 (4 1/2 - 7')	"	-	-	"	"	1			
MW3 (7 - 9 1/2')	"	-	-	"	"	1			
MW4 (9 1/2 - 12')	"	-	-	"	"	1			
Preservation Used: 1=Ice; 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other									
Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample									
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Special Instructions/QC Requirements & Comments:									
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No		Cooler Temp (°C) Obs'd		Cor'd		Therm ID No	
Relinquished by: [Signature]		Company: Geo Tek Eng		Received by: [Signature]		Company:		Date/Time	
Relinquished by:		Company:		Received by:		Company:		Date/Time	
Relinquished by:		Company:		Received in Laboratory by: [Signature]		Company: Eurofins		Date/Time: 8/8/23 0855	

Login Sample Receipt Checklist

Client: GeoTek Engineering & Testing Services

Job Number: 310-262032-1

SDG Number: 23-1127

Login Number: 262032

List Number: 1

Creator: Lage, Sydney

List Source: Eurofins Cedar Falls

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

APPENDIX C

ANALYTICAL REPORT

PREPARED FOR

Attn: Jerry Zutz
GeoTek Engineering & Testing Services
909 E. 50th Street
Sioux Falls, South Dakota 57104

Generated 8/20/2023 8:29:56 PM

JOB DESCRIPTION

Former Tayler Oil
SDG NUMBER 23-1127

JOB NUMBER

310-262442-1

Eurofins Cedar Falls

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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8/20/2023 8:29:56 PM

Authorized for release by
Conner Calhoun, Project Management Assistant I
Conner.Calhoun@et.eurofinsus.com
(319)277-2401

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Case Narrative

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Job ID: 310-262442-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative 310-262442-1

Receipt

The samples were received on 8/11/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.9°C

Hydrocarbons

Method OA1: Surrogate recovery for the following sample was outside control limits: (LCS 310-396629/5). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method OA1: Surrogate recovery for the following sample was outside the upper control limit: (LCS 310-396972/2).

Method OA1: The continuing calibration verification (CCV) associated with batch 310-396972 recovered above the upper control limit for 4-Bromofluorobenzene (Surr). The samples associated with this CCV were within sample QC criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-396972/28).

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

Diesel Range Organics

Method OA2: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-396512. The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

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

Sample Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-262442-1	MW1	Water	08/10/23 11:30	08/11/23 09:40
310-262442-2	MW2	Water	08/10/23 11:55	08/11/23 09:40
310-262442-3	MW3	Water	08/10/23 11:50	08/11/23 09:40
310-262442-4	MW4	Water	08/10/23 11:35	08/11/23 09:40

Detection Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW1

Lab Sample ID: 310-262442-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	56.6		2.00		ug/L	1		OA-1 (GC)	Total/NA
Toluene	4.17		2.00		ug/L	1		OA-1 (GC)	Total/NA
Ethylbenzene	357		2.00		ug/L	1		OA-1 (GC)	Total/NA
Xylenes, Total	1730		30.0		ug/L	5		OA-1 (GC)	Total/NA
TPH (as Gasoline)	9740		500		ug/L	1		OA-1 (GC)	Total/NA
Methyl tert-butyl ether	6.08		2.00		ug/L	1		OA-1 (GC)	Total/NA
Diesel	37900		288		ug/L	1		OA-2	Total/NA
Naphthalene	335		38.5		ug/L	2		OA-2	Total/NA

Client Sample ID: MW2

Lab Sample ID: 310-262442-2

No Detections.

Client Sample ID: MW3

Lab Sample ID: 310-262442-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	79.8		2.00		ug/L	1		OA-1 (GC)	Total/NA
Toluene	23.5		2.00		ug/L	1		OA-1 (GC)	Total/NA
Ethylbenzene	940		10.0		ug/L	5		OA-1 (GC)	Total/NA
Xylenes, Total	1080		6.00		ug/L	1		OA-1 (GC)	Total/NA
TPH (as Gasoline)	18000		2500		ug/L	5		OA-1 (GC)	Total/NA
Methyl tert-butyl ether	106		2.00		ug/L	1		OA-1 (GC)	Total/NA
Gasoline	24800		283		ug/L	1		OA-2	Total/NA
Naphthalene	319		18.9		ug/L	1		OA-2	Total/NA

Client Sample ID: MW4

Lab Sample ID: 310-262442-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	107		2.00		ug/L	1		OA-1 (GC)	Total/NA
Toluene	4.80		2.00		ug/L	1		OA-1 (GC)	Total/NA
Ethylbenzene	119		2.00		ug/L	1		OA-1 (GC)	Total/NA
TPH (as Gasoline)	25900		5000		ug/L	10		OA-1 (GC)	Total/NA
Methyl tert-butyl ether	105		2.00		ug/L	1		OA-1 (GC)	Total/NA
Diesel	23600		288		ug/L	1		OA-2	Total/NA
Naphthalene	275		19.2		ug/L	1		OA-2	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW1

Lab Sample ID: 310-262442-1

Date Collected: 08/10/23 11:30

Matrix: Water

Date Received: 08/11/23 09:40

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	56.6		2.00		ug/L			08/16/23 22:34	1
Toluene	4.17		2.00		ug/L			08/16/23 22:34	1
Ethylbenzene	357		2.00		ug/L			08/16/23 22:34	1
Xylenes, Total	1730		30.0		ug/L			08/18/23 00:37	5
TPH (as Gasoline)	9740		500		ug/L			08/16/23 22:34	1
Methyl tert-butyl ether	6.08		2.00		ug/L			08/16/23 22:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	188	S1+	46 - 150		08/16/23 22:34	1
4-Bromofluorobenzene (Surr)	140		46 - 150		08/18/23 00:37	5

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<288		288		ug/L		08/14/23 10:13	08/16/23 15:12	1
Diesel	37900		288		ug/L		08/14/23 10:13	08/16/23 15:12	1
Waste Oil	<288		288		ug/L		08/14/23 10:13	08/16/23 15:12	1
Naphthalene	335		38.5		ug/L		08/14/23 10:13	08/17/23 13:08	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	86		17 - 120	08/14/23 10:13	08/16/23 15:12	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW2

Lab Sample ID: 310-262442-2

Date Collected: 08/10/23 11:55

Matrix: Water

Date Received: 08/11/23 09:40

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00		2.00		ug/L			08/17/23 23:40	1
Toluene	<2.00		2.00		ug/L			08/16/23 20:10	1
Ethylbenzene	<2.00		2.00		ug/L			08/17/23 23:40	1
Xylenes, Total	<6.00		6.00		ug/L			08/17/23 23:40	1
TPH (as Gasoline)	<500		500		ug/L			08/16/23 20:10	1
Methyl tert-butyl ether	<2.00		2.00		ug/L			08/16/23 20:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	119		46 - 150		08/16/23 20:10	1
4-Bromofluorobenzene (Surr)	123		46 - 150		08/17/23 23:40	1

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<294		294		ug/L		08/14/23 10:13	08/16/23 15:27	1
Diesel	<294		294		ug/L		08/14/23 10:13	08/16/23 15:27	1
Waste Oil	<294		294		ug/L		08/14/23 10:13	08/16/23 15:27	1
Naphthalene	<19.6		19.6		ug/L		08/14/23 10:13	08/16/23 15:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	75		17 - 120	08/14/23 10:13	08/16/23 15:27	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW3

Lab Sample ID: 310-262442-3

Date Collected: 08/10/23 11:50

Matrix: Water

Date Received: 08/11/23 09:40

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	79.8		2.00		ug/L			08/16/23 21:07	1
Toluene	23.5		2.00		ug/L			08/16/23 21:07	1
Ethylbenzene	940		10.0		ug/L			08/18/23 01:35	5
Xylenes, Total	1080		6.00		ug/L			08/16/23 21:07	1
TPH (as Gasoline)	18000		2500		ug/L			08/18/23 01:35	5
Methyl tert-butyl ether	106		2.00		ug/L			08/16/23 21:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	466	S1+	46 - 150		08/16/23 21:07	1
4-Bromofluorobenzene (Surr)	189	S1+	46 - 150		08/18/23 01:35	5

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	24800		283		ug/L		08/14/23 10:13	08/16/23 15:41	1
Diesel	<283		283		ug/L		08/14/23 10:13	08/16/23 15:41	1
Waste Oil	<283		283		ug/L		08/14/23 10:13	08/16/23 15:41	1
Naphthalene	319		18.9		ug/L		08/14/23 10:13	08/16/23 15:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	96		17 - 120	08/14/23 10:13	08/16/23 15:41	1

Client Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW4

Lab Sample ID: 310-262442-4

Date Collected: 08/10/23 11:35

Matrix: Water

Date Received: 08/11/23 09:40

Method: Iowa DNR OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	107		2.00		ug/L			08/16/23 22:05	1
Toluene	4.80		2.00		ug/L			08/16/23 22:05	1
Ethylbenzene	119		2.00		ug/L			08/16/23 22:05	1
Xylenes, Total	<6.00		6.00		ug/L			08/16/23 22:05	1
TPH (as Gasoline)	25900		5000		ug/L			08/18/23 01:06	10
Methyl tert-butyl ether	105		2.00		ug/L			08/16/23 22:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	366	S1+	46 - 150		08/16/23 22:05	1
4-Bromofluorobenzene (Surr)	152	S1+	46 - 150		08/18/23 01:06	10

Method: Iowa DNR OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<288		288		ug/L		08/14/23 10:13	08/16/23 15:56	1
Diesel	23600		288		ug/L		08/14/23 10:13	08/16/23 15:56	1
Waste Oil	<288		288		ug/L		08/14/23 10:13	08/16/23 15:56	1
Naphthalene	275		19.2		ug/L		08/14/23 10:13	08/16/23 15:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	87		17 - 120	08/14/23 10:13	08/16/23 15:56	1

Definitions/Glossary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Qualifiers

GC VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

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

Surrogate Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	BFB (46-150)
310-262442-1	MW1	188 S1+
310-262442-1	MW1	140
310-262442-2	MW2	119
310-262442-2	MW2	123
310-262442-3	MW3	466 S1+
310-262442-3	MW3	189 S1+
310-262442-4	MW4	366 S1+
310-262442-4	MW4	152 S1+
LCS 310-396629/3	Lab Control Sample	117
LCS 310-396629/5	Lab Control Sample	206 S1+
LCS 310-396972/2	Lab Control Sample	209 S1+
LCS 310-396972/3	Lab Control Sample	121
MB 310-396629/4	Method Blank	112
MB 310-396972/4	Method Blank	115
Surrogate Legend		
BFB = 4-Bromofluorobenzene (Surr)		

Method: OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	OTCN (17-120)
310-262442-1	MW1	86
310-262442-2	MW2	75
310-262442-3	MW3	96
310-262442-4	MW4	87
LCS 310-396512/2-A	Lab Control Sample	77
LCSD 310-396512/3-A	Lab Control Sample Dup	77
MB 310-396512/1-A	Method Blank	76
Surrogate Legend		
OTCN = n-Octacosane		

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 310-396629/4

Matrix: Water

Analysis Batch: 396629

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00		2.00		ug/L			08/16/23 14:27	1
Toluene	<2.00		2.00		ug/L			08/16/23 14:27	1
Ethylbenzene	<2.00		2.00		ug/L			08/16/23 14:27	1
Xylenes, Total	<6.00		6.00		ug/L			08/16/23 14:27	1
TPH (as Gasoline)	<500		500		ug/L			08/16/23 14:27	1
Methyl tert-butyl ether	<2.00		2.00		ug/L			08/16/23 14:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	112		46 - 150		08/16/23 14:27	1

Lab Sample ID: LCS 310-396629/3

Matrix: Water

Analysis Batch: 396629

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	40.0	38.68		ug/L		97	76 - 120
Toluene	40.0	37.70		ug/L		94	80 - 120
Ethylbenzene	40.0	37.13		ug/L		93	80 - 120
Xylenes, Total	120	111.1		ug/L		93	79 - 120
Methyl tert-butyl ether	40.0	38.98		ug/L		97	63 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	117		46 - 150

Lab Sample ID: LCS 310-396629/5

Matrix: Water

Analysis Batch: 396629

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TPH (as Gasoline)	2000	1735		ug/L		87	77 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	206	S1+	46 - 150

Lab Sample ID: MB 310-396972/4

Matrix: Water

Analysis Batch: 396972

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00		2.00		ug/L			08/17/23 16:55	1
Toluene	<2.00		2.00		ug/L			08/17/23 16:55	1
Ethylbenzene	<2.00		2.00		ug/L			08/17/23 16:55	1
Xylenes, Total	<6.00		6.00		ug/L			08/17/23 16:55	1
TPH (as Gasoline)	<500		500		ug/L			08/17/23 16:55	1
Methyl tert-butyl ether	<2.00		2.00		ug/L			08/17/23 16:55	1

Eurofins Cedar Falls

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Method: OA-1 (GC) - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 310-396972/4

Matrix: Water

Analysis Batch: 396972

Client Sample ID: Method Blank

Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	115		46 - 150		08/17/23 16:55	1

Lab Sample ID: LCS 310-396972/2

Matrix: Water

Analysis Batch: 396972

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TPH (as Gasoline)	2000	1784		ug/L		89	77 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	209	S1+	46 - 150

Lab Sample ID: LCS 310-396972/3

Matrix: Water

Analysis Batch: 396972

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	40.0	43.65		ug/L		109	76 - 120
Toluene	40.0	42.62		ug/L		107	80 - 120
Ethylbenzene	40.0	42.21		ug/L		106	80 - 120
Xylenes, Total	120	126.4		ug/L		105	79 - 120
Methyl tert-butyl ether	40.0	43.93		ug/L		110	63 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	121		46 - 150

Method: OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 310-396512/1-A

Matrix: Water

Analysis Batch: 396736

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 396512

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	<300		300		ug/L		08/14/23 10:13	08/16/23 11:08	1
Diesel	<300		300		ug/L		08/14/23 10:13	08/16/23 11:08	1
Waste Oil	<300		300		ug/L		08/14/23 10:13	08/16/23 11:08	1
Naphthalene	<20.0		20.0		ug/L		08/14/23 10:13	08/16/23 11:08	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	76		17 - 120	08/14/23 10:13	08/16/23 11:08	1

Lab Sample ID: LCS 310-396512/2-A

Matrix: Water

Analysis Batch: 396736

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396512

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel	4000	2841		ug/L		71	22 - 120

Eurofins Cedar Falls

QC Sample Results

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Method: OA-2 - Iowa - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 310-396512/2-A

Matrix: Water

Analysis Batch: 396736

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396512

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
n-Octacosane	77		17 - 120

Lab Sample ID: LCSD 310-396512/3-A

Matrix: Water

Analysis Batch: 396736

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 396512

	Spike	LCSD	LCSD					%Rec	RPD	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Diesel	4000	3162		ug/L		79	22 - 120	11	35	

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
n-Octacosane	77		17 - 120

QC Association Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

GC VOA

Analysis Batch: 396629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262442-1	MW1	Total/NA	Water	OA-1 (GC)	
310-262442-2	MW2	Total/NA	Water	OA-1 (GC)	
310-262442-3	MW3	Total/NA	Water	OA-1 (GC)	
310-262442-4	MW4	Total/NA	Water	OA-1 (GC)	
MB 310-396629/4	Method Blank	Total/NA	Water	OA-1 (GC)	
LCS 310-396629/3	Lab Control Sample	Total/NA	Water	OA-1 (GC)	
LCS 310-396629/5	Lab Control Sample	Total/NA	Water	OA-1 (GC)	

Analysis Batch: 396972

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262442-1	MW1	Total/NA	Water	OA-1 (GC)	
310-262442-2	MW2	Total/NA	Water	OA-1 (GC)	
310-262442-3	MW3	Total/NA	Water	OA-1 (GC)	
310-262442-4	MW4	Total/NA	Water	OA-1 (GC)	
MB 310-396972/4	Method Blank	Total/NA	Water	OA-1 (GC)	
LCS 310-396972/2	Lab Control Sample	Total/NA	Water	OA-1 (GC)	
LCS 310-396972/3	Lab Control Sample	Total/NA	Water	OA-1 (GC)	

GC Semi VOA

Prep Batch: 396512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262442-1	MW1	Total/NA	Water	3510C	
310-262442-2	MW2	Total/NA	Water	3510C	
310-262442-3	MW3	Total/NA	Water	3510C	
310-262442-4	MW4	Total/NA	Water	3510C	
MB 310-396512/1-A	Method Blank	Total/NA	Water	3510C	
LCS 310-396512/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 310-396512/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 396736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262442-1	MW1	Total/NA	Water	OA-2	396512
310-262442-2	MW2	Total/NA	Water	OA-2	396512
310-262442-3	MW3	Total/NA	Water	OA-2	396512
310-262442-4	MW4	Total/NA	Water	OA-2	396512
MB 310-396512/1-A	Method Blank	Total/NA	Water	OA-2	396512
LCS 310-396512/2-A	Lab Control Sample	Total/NA	Water	OA-2	396512
LCSD 310-396512/3-A	Lab Control Sample Dup	Total/NA	Water	OA-2	396512

Analysis Batch: 396880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262442-1	MW1	Total/NA	Water	OA-2	396512

Lab Chronicle

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Client Sample ID: MW1

Lab Sample ID: 310-262442-1

Date Collected: 08/10/23 11:30

Matrix: Water

Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	OA-1 (GC)		1	396629	D2YP	EET CF	08/16/23 22:34
Total/NA	Analysis	OA-1 (GC)		5	396972	D2YP	EET CF	08/18/23 00:37
Total/NA	Prep	3510C			396512	Y6AF	EET CF	08/14/23 10:13
Total/NA	Analysis	OA-2		1	396736	C3AA	EET CF	08/16/23 15:12
Total/NA	Prep	3510C			396512	Y6AF	EET CF	08/14/23 10:13
Total/NA	Analysis	OA-2		2	396880	C3AA	EET CF	08/17/23 13:08

Client Sample ID: MW2

Lab Sample ID: 310-262442-2

Date Collected: 08/10/23 11:55

Matrix: Water

Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	OA-1 (GC)		1	396629	D2YP	EET CF	08/16/23 20:10
Total/NA	Analysis	OA-1 (GC)		1	396972	D2YP	EET CF	08/17/23 23:40
Total/NA	Prep	3510C			396512	Y6AF	EET CF	08/14/23 10:13
Total/NA	Analysis	OA-2		1	396736	C3AA	EET CF	08/16/23 15:27

Client Sample ID: MW3

Lab Sample ID: 310-262442-3

Date Collected: 08/10/23 11:50

Matrix: Water

Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	OA-1 (GC)		1	396629	D2YP	EET CF	08/16/23 21:07
Total/NA	Analysis	OA-1 (GC)		5	396972	D2YP	EET CF	08/18/23 01:35
Total/NA	Prep	3510C			396512	Y6AF	EET CF	08/14/23 10:13
Total/NA	Analysis	OA-2		1	396736	C3AA	EET CF	08/16/23 15:41

Client Sample ID: MW4

Lab Sample ID: 310-262442-4

Date Collected: 08/10/23 11:35

Matrix: Water

Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	OA-1 (GC)		1	396629	D2YP	EET CF	08/16/23 22:05
Total/NA	Analysis	OA-1 (GC)		10	396972	D2YP	EET CF	08/18/23 01:06
Total/NA	Prep	3510C			396512	Y6AF	EET CF	08/14/23 10:13
Total/NA	Analysis	OA-2		1	396736	C3AA	EET CF	08/16/23 15:56

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Eurofins Cedar Falls

Accreditation/Certification Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-23
Georgia	State	IA100001 (OR)	09-29-23
Illinois	NELAP	200024	11-29-23
Iowa	State	007	12-01-23
Kansas	NELAP	E-10341	01-31-24
Minnesota	NELAP	019-999-319	12-31-23
Minnesota (Petrofund)	State	3349	01-18-24
North Dakota	State	R-186	09-29-23
Oregon	NELAP	IA100001	09-29-23

Method Summary

Client: GeoTek Engineering & Testing Services
Project/Site: Former Tayler Oil

Job ID: 310-262442-1
SDG: 23-1127

Method	Method Description	Protocol	Laboratory
OA-1 (GC)	Volatile Petroleum Hydrocarbons (GC)	Iowa DNR	EET CF
OA-2	Iowa - Extractable Petroleum Hydrocarbons (GC)	Iowa DNR	EET CF
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF

Protocol References:

Iowa DNR = Iowa Department of Natural Resources

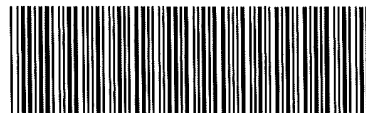
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



Environment Testing
America



310-262442 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Geotek</u>			
City/State: <u>Sioux Falls</u>	STATE: <u>SD</u>	Project:	
Receipt Information			
Date/Time Received: <u>8/11/23</u>	DATE: <u>8/11/23</u>	TIME: <u>0946</u>	Received By: <u>J</u>
Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler? ☒ Yes ☐ No		If yes: Cooler ID: _____	
Multiple Coolers? ☐ Yes ☒ No		If yes: Cooler # _____ of _____	
Cooler Custody Seals Present? ☒ Yes ☐ No		If yes: Cooler custody seals intact? ☒ Yes ☐ No	
Sample Custody Seals Present? ☐ Yes ☒ No		If yes: Sample custody seals intact? ☐ Yes ☐ No	
Trip Blank Present? ☐ Yes ☒ No		If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>tu</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>29</u>		Corrected Temp (°C): <u>29</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No a) If yes: Is there evidence that the chilling process began? ☐ Yes ☐ No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Environment Testing
America

Chain of Custody Record

Environment Testing
America

[illegible]

Login Sample Receipt Checklist

Client: GeoTek Engineering & Testing Services

Job Number: 310-262442-1

SDG Number: 23-1127

Login Number: 262442

List Number: 1

Creator: Lage, Sydney

List Source: Eurofins Cedar Falls

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

APPENDIX D

METHODS

DECONTAMINATION

Prior to mobilization of the drill rig, the down-hole drilling equipment and associated tools are steam cleaned. Additionally, the down-hole drilling equipment and associated tools are steam cleaned after each boring where contamination is encountered. Also, the split barrel sampler is washed with a tri-sodium phosphate solution and rinsed in potable water after each contaminated sample.

SOIL BORING AND SAMPLING

The boreholes are advanced with a truck-mounted, rotary, drill rig using flight auger or hollow stem auger drilling methods. Flight auger and hollow stem auger soil samples are obtained directly from the auger flights during drilling. Split barrel soil samples are obtained by advancing a 2" outside diameter split barrel sampler into the soil a distance of 2 1/2'.

Soil samples for field petroleum vapor scanning are placed in clean, 8 oz. glass jars covered with aluminum foil, and sealed with lids. Sample jar identification labels are completed indicating the job number, boring number, sample number, sample depth, date sampled, and the sampling personnel's initials.

Soil samples for laboratory chemical analysis are placed in laboratory provided containers. Sample container identification labels are completed indicating the job number, sample location, boring number, boring depth, date sampled, analysis required, and sampling personnel's initials.

SOIL SAMPLE ORGANIC VAPOR SCANNING

The recovered soil samples are scanned with a photoionization detector (PID) equipped with a 10.2 eV lamp. The instrument is calibrated for direct readings in parts per million (ppm) of benzene. The instrument has a reported accuracy range under ideal operating conditions of 1 to 2000 ppm.

Following a minimum 10-minute delay after sample collection, the jar is agitated and the PID probe is used to penetrate the aluminum foil following removal of the sample jar lid. The peak reading (usually within 10 seconds) is recorded on the identification label. Samples obtained during unfavorable weather conditions (below 40°F or during precipitation) are warmed and stored in a vehicle or building prior to taking PID readings.

MONITORING WELL DEVELOPMENT

Monitoring well development is performed with dedicated bottom loading bailers. The wells are bailed until relatively sediment free water is produced or until the well became dry. Groundwater level data and sampling information forms are completed during development.

MONITORING WELL EVACUATION AND WATER QUALITY SAMPLING

Stagnant water is evacuated from the wells prior to water quality sampling using a dedicated bottom loading bailer. Water is bailed from the well until three well volumes were removed or until the well becomes dry. Groundwater level data and sampling information forms are completed during sampling.

WATER LEVELS

Water levels in monitoring wells area obtained by using a water level meter (dip meter). The meter consists of a stainless steel electrode or a brass plated probe connected to a polyethylene flap tape (permanently marked to 1/20 of a foot) containing two stainless steel conductors. The probe is lowered into the monitoring well and, when contact is made with the water, the circuit is completed activating a clearly audible buzzer. The distance between the water surface and the top of the riser is measured using the flat tape. All measurements are reported to the nearest 0.01foot.

PRODUCT THICKNESS

Product thickness in monitoring wells is obtained by using an oil-water interface gauge. The gauge consists of a sonic probe connected to a gauging tape (permanently marked to 1/32 of a foot). The probe is lowered into the monitoring well and when the gap in the sonic probe is fully immersed in product, a continuous audible signal will be heard. The distance between the air/product and product/water interfaces and the top of riser is measured using the gauging tape. The product thickness is then determined by subtraction and air/product and product/water interface measurements. All measurements are reported to the nearest 0.01'.

WATER QUALITY SAMPLING

Stagnant water in the wells is removed prior to water quality sampling by using a dedicated, bottom loading bailer. Water is bailed from the well until a minimum of three well volumes are removed or until the well becomes dry. Groundwater level data and sampling information forms are then completed during sampling.

Water quality samples are obtained using the dedicated, bottom loading bailers. Volatile samples are transferred directly from the bailers into laboratory provided, 40 milliliter, purge and trap vials. Semi-volatile samples are collected in laboratory provided containers. Sample container identification labels are then completed indicating the job number, sample location, date sampled, analysis required, and sampling personnel's initials.

CHAIN OF CUSTODY

Analytical sample information is recorded on a chain of custody form following sample collection. The chain of custody record accompanies the samples during transit back to GeoTek's office, during storage, and during any subsequent shipment to a contract laboratory. A copy of the record is always kept by GeoTek. Upon completion of the laboratory analysis, the completed chain of custody record is returned to GeoTek.