Quarterly Groundwater Monitoring
First Quarter 2015

Tiger Oil North 1st
Yakima, Washington

for
Washington State Department of Ecology

May 18, 2015

GeoEngineers
Earth Science + Technology

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File No. 0504-101-00

May 18, 2015

Prepared for:

Washington State Department of Ecology
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1.0 INTRODUCTION

This report describes groundwater monitoring activities conducted on March 10, 2015 at the Tiger Oil North 1st site located at 1808 North 1st Street in Yakima, Washington (herein referred to as "site"). The site is located approximately as shown in the Vicinity Map, Figure 1.

Environmental investigation activities at the site currently are managed by the Washington State Department of Ecology (Ecology). This report provides a brief site description and background, our scope of services, a description of field activities, chemical analytical results and conclusions for the March 2015 groundwater monitoring event.

2.0 SITE DESCRIPTION AND BACKGROUND

The site is located at 1808 North 1st Street in Yakima, Washington. The site is bordered by arterial roadway North 1st Street to the east and the Sun Country Inn to the south and west of the site. A paved entrance to the All Star Motel and Ron Nehls Auto Sales is located to the north as shown on Site Plan and Sample Locations, Figure 2.

The site operated as a retail gasoline station and convenience store until closure in 2001. The site contains two buildings and three historical fuel dispenser islands formerly under a central canopy. Buildings at the site include the larger former convenience store in the southwest corner of the site and a smaller kiosk near the center of the site. The site is generally paved, except where four former underground storage tanks (USTs) were removed from the north central portion of the site.

In 1982, a release of approximately 12,000 to 22,000 gallons of leaded and unleaded gasoline from delivery lines occurred between the tanks and dispensers (Wagner et al., 1991). The release reportedly contaminated drinking water wells to the east and residential units in the area were eventually connected to a public water supply source.

Remediation activities included installation of 34 groundwater monitoring wells and two recovery wells. These wells were installed both as part of the remediation activities and for a hydrogeological study performed in the area. It is unknown how many of these wells remain today and if decommissioning reports are available for the wells. These wells have not been located as part of previous assessments. Removal records indicate that approximately 40 gallons of free product was recovered between 1982 and 1983. Recovery efforts were ceased in 1983 because of the cost of spill response efforts and low product recovery volume. Groundwater monitoring conducted in 1989 indicated concentrations of benzene and xylenes greater than Model Toxics Control Act (MTCA) Method A cleanup levels in groundwater samples collected from wells directly east of the site (Wagner et al., 1991).

In 2005, four USTs were decommissioned at the site and the subsurface fuel lines were drained and capped with quick setting cement. The tanks removed from the site included:

- 20,000-gallon steel unleaded gasoline tank
- 10,000-gallon steel unleaded gasoline tank

- 8,000-gallon steel unleaded gasoline tank
- 6,000-gallon diesel tank

Upon removal, the tanks were examined by Tetra Tech FW, Inc., Tri-Valley Construction and Ecology. The tanks had minor surface rust and were reported to be in good condition with no visual evidence of leaks or holes. However, some visual evidence of staining near the fill pipe and turbine unit, and in the surrounding soil was observed near the 20,000-gallon UST (Tetra Tech, 2005). Evidence of fill piping or turbine unit spillage was not observed on the other three tanks.

Soil samples collected from the tank removal excavation in 2005 indicated the presence of gasoline contamination at depths of 8 and 13 feet in 2 of the 10 samples collected (McCreedy, 2005). Detected gasoline in samples reportedly was weathered, as indicated by the absence of benzene. The UST excavation was backfilled with both excavated soil and imported fill material. The Tetra Tech report (Tetra Tech, 2005) does not indicate if excavated soil used to backfill the excavation was contaminated or if any contaminated soil was transported off site. Fuel dispensers and product delivery lines were not assessed as part of the 2005 work.

In 2014, GeoEngineers, Inc. (GeoEngineers) conducted additional assessment activities in order to confirm the presence and extents of contamination identified during the 2005 UST removal (GeoEngineers, 2014c). The additional assessment activities included advancing eight direct-push borings, collecting groundwater samples from temporary wells installed in each direct-push boring, installing five groundwater monitoring wells with flush mount monuments and, in September 2014, collecting groundwater samples from the new wells. Exploration locations and soil cleanup level exceedances are shown in Figure 2.

Results of the 2014 assessment indicated petroleum contamination exceeding MTCA Method A cleanup criteria were present in soil samples collected near the former tank pit and fuel dispenser islands. Field screening results of soil samples from boring N1DP-5 generally indicated petroleum contamination in soil had not migrated to the south portion of the property. Concentrations of diesel-range petroleum hydrocarbons (DRPH) and oil-range petroleum hydrocarbons (ORPH) less than MTCA Method A cleanup levels for unrestricted land use have been observed in soil samples from borings N1MW-3 and N1MW-5, indicating that low-level contamination might have migrated to north and south portions of the site. Soil assessment results can be summarized by the following:

- Gasoline-range petroleum hydrocarbons (GRPH), DRPH, benzene, toluene, ethylbenzene and xylenes (BTEX), and naphthalenes were detected at concentrations exceeding MTCA Method A cleanup criteria in soil samples from N1DP-8.
- GRPH, benzene, ethylbenzene, xylenes and naphthalenes were detected at concentrations exceeding MTCA Method A cleanup criteria in soil samples from N1DP-1 and N1DP-3.
- GRPH were detected at concentrations exceeding the MTCA Method A cleanup criteria in soil samples from N1DP-2 and N1DP-4.

Laboratory analytical results indicated contaminants of concern did not exceed MTCA Method A cleanup criteria in groundwater samples collected from the five groundwater monitoring wells (N1MW-1 through N1MW-5). Results of hydrocarbon identification (HCID) analyses indicated the presence of GRPH, DRPH or ORPH in temporary wells completed in N1DP-1 through N1DP-5. Sampling methods from temporary wells

and analytical methods using HCID analysis are not as accurate as other methods and therefore the results should be considered as screening tools. Groundwater samples collected from the direct-push borings were generally turbid and analytical results might not be representative of actual groundwater conditions.

3.0 SCOPE OF SERVICES

GeoEngineers prepared a Work Plan, dated April 15, 2014 (GeoEngineers, 2014a) and supplemental memorandum (GeoEngineers, 2014b) to guide the groundwater monitoring activities described herein. The scope of services performed by GeoEngineers during the quarterly groundwater monitoring event conducted on March 10, 2015 included:

- Measuring well headspace vapors and depth to groundwater in each of the five monitoring wells (N1MW-1 through N1MW-5).
- Measuring water quality parameters including pH, temperature, specific conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and ferrous iron.
- Collecting primary groundwater samples from each well and a duplicate sample from N1MW-1 using low-flow/low-stress sampling techniques.
- Submitting groundwater samples to TestAmerica Laboratories, Inc. (TestAmerica) for chemical analysis of:
    - GRPH (Northwest Method NWTPH-Gx);
    - DRPH (Northwest Method NWTPH-Dx, with and without silica gel cleanup);
    - Volatile organic compounds (VOCs) (Environmental Protection Agency [EPA] Method 8260C);
    - 1,2-dibromoethane (EDB) (EPA Method 8011C);
    - Total Organic Carbon (TOC) (Method SM5310C);
    - Lead (EPA Method 200.7); and
    - Polycyclic aromatic hydrocarbons (PAHs) including naphthalenes (EPA Method 8270D).
- Comparing laboratory analytical results with applicable project cleanup criteria.
- Calculating groundwater elevation within site monitoring wells.
- Estimating groundwater flow direction and the range in hydraulic gradient across the site.

Samples were also analyzed for two natural attenuation parameters: nitrate and sulfate (SO_4) by EPA Method 300.0. Soluble ferrous iron (Fe^{+2}), which has a 15-minute hold time, was analyzed in the field using a Hach IR-18C color disc test kit and the 1,10 phenanthroline testing method.

4.0 FIELD ACTIVITIES

4.1. Monitoring Well Headspace Vapor Monitoring

Monitoring well headspace vapors were measured on March 10, 2015 using a photoionization detector (PID). Headspace measurements were collected by inserting the PID probe into the well casing immediately after removing the well cap and recording the maximum observed concentration. Headspace vapors were

measured at less than 1.0 part per million in monitoring wells N1MW-1 though N1MW-5, as shown in Summary of Groundwater Field Parameters, Table 1.

4.2. Groundwater Elevation Monitoring

Static depth to groundwater was measured in monitoring wells N1MW-1 through N1MW-5 on March 10, 2015 using an electronic water level indicator. Depth to groundwater ranged from 11.26 feet (N1MW-4) to 14.05 feet (N1MW-1) below the top of well casing, as shown in Summary of Groundwater Level Measurements, Table 2. Groundwater elevations ranged from about 1,070.51 feet in N1MW-2 to 1,070.87 feet in N1MW-4 and N1MW-5. In monitoring wells N1MW-1 through N1MW-5, groundwater elevations decreased an average of about 0.3 feet relative to the previous monitoring event conducted during December 2014.

Based on groundwater elevations measured on March 10, 2015, groundwater flow in the shallow unconfined aquifer beneath the property generally was toward the east, as shown in Groundwater Elevation and Interpreted Flow Direction, March 10, 2015, Figure 3. The estimated hydraulic groundwater gradient of the shallow aquifer was about 0.002 feet per foot (about 11 feet per mile). Groundwater elevation contours were interpreted from depth to water measurements, surveyed elevations of well casings and Surfer Version 1.2.

4.3. Groundwater Sampling

Monitoring wells N1MW-1 through N1MW-5 were purged and sampled in general conformance with standard low-flow sampling methodology on March 10, 2015. A duplicate sample was collected from N1MW-1. A peristaltic pump and dedicated well tubing were used to purge and sample each well. Groundwater quality parameters were measured at approximate 3-minute intervals during well purging. Groundwater samples were collected in conformance with the stabilization and/or maximum purge time criteria presented in Appendix A. Groundwater field parameters recorded at the conclusion of well purging are provided in Table 1.

Purge water generated during groundwater sampling was drummed, labeled and stored on the site pending profiling and disposal.

5.0 CHEMICAL ANALYTICAL RESULTS

5.1. Groundwater Chemical Analytical Results

Analytical results for samples collected on March 10, 2015 are tabulated and compared to previous results and MTCA Method A cleanup criteria in Summary of Chemical Analytical Results – Groundwater, Table 3 and Summary of Chemical Analytical Results – Groundwater PAHs, Table 4. TestAmerica's laboratory report is provided in Appendix B.

The following is a summary of the March 10, 2015 analytical data:

- GRPH was detected at concentrations less than the MTCA Method A cleanup criteria in the samples from N1MW-1 and N1MW-2. GRPH was not detected in samples collected from monitoring wells N1MW-3, N1MW-4 or N1MW-5.

- DRPH was detected at a concentrations less than the MTCA Method A cleanup criteria in the sample from N1MW-2. DRPH was not detected in samples collected from monitoring wells N1MW-1, N1MW-3, N1MW-4 or N1MW-5.
- Other site contaminants of concern were either not detected or were detected at concentrations less than their respective cleanup criteria in groundwater samples collected from site wells.

N1MW-2 is located downgradient of observed soil contamination at the site. However, groundwater samples collected and analyzed from N1MW-2 indicate that groundwater near that well may contain contamination that has migrated from sources on the Tiger Oil site, but at concentrations less than MTCA Method A cleanup criteria.

5.2. Natural Attenuation Parameters

In addition to the contaminants of concern, groundwater samples were analyzed for natural attenuation parameters and field parameters. Results of laboratory-analyzed natural attenuation parameters are provided in Table 3. Field measurement results are provided in Table 1. Reported field parameters reflect stabilized conditions at the conclusion of well purging during low-flow sampling. Low DO and nitrate concentrations observed in December 2014 and March 2015 suggest possible biodegradation of petroleum contamination near N1MW-2.

Dissolved oxygen was measured at 0.06 milligrams per liter in monitoring well N1MW-2, and 0.42 milligrams per liter (mg/L) in monitoring well N1MW-5, suggesting that anaerobic conditions are present in shallow groundwater beneath the site near these wells and that electron acceptors other than oxygen are relied on to metabolize contaminants during biodegradation reactions. In general, observed natural attenuation parameters suggest that natural attenuation processes (and associated loss of contaminant mass) are ongoing near N1MW-2 and N1MW-5. This conclusion is based on the following observed conditions in monitoring wells N1MW-2 and N1MW-5 relative to up- and cross-gradient monitoring wells N1MW-1, N1MW-3 and N1MW-4.

- Lower field-measured ORP and DO.
- A slight decrease in nitrate concentrations, which can act as an electron acceptor compound in natural attenuation processes.
- An increase in the ferrous iron concentrations in N1MW-5, which can be an indicator of natural attenuation processes.

5.3. QA/QC Summary

GeoEngineers reviewed the laboratory internal quality assurance/quality control (QA/QC) in the context of project data quality goals. Results of our review, as well as our evaluation of data suitability, are provided in Appendix B. In summary, it is our opinion that the quality of the analytical data generally is acceptable for the intended use. However, the following items were noted:

- The laboratory noted that the trip blank sample was not written on the chain-of-custody (COC).
- There was a positive result for naphthalene in the method blank extracted on March 16, 2015. The associated field samples, MW-5-031015 and MW-Dup-031015 exhibited a positive result for this analyte. The positive results for naphthalene were qualified as non-detected (U) in these samples.

- The percent recovery for acetone was greater than the control limits in the laboratory control sample (LCS) extracted on March 12, 2015. There were no positive results for this target analyte in the associated field samples; therefore, no action was required for this outlier.
- One field duplicate sample pair, MW-1-031015 and MW-Dup-031015, was submitted with this sample delivery group (SDG). The precision criteria for all target analytes were met for this sample pair, with the exception of 1,2,4-Trimethylbenzene. The positive results for this target analyte were qualified as estimated (J) in this sample pair.
- The laboratory reported two sets of PAH results for Samples MW-5-031015 and MW-Dup-031015, an initial and a reanalysis, due to a method blank detection of naphthalene and positive results for this analyte in these samples. The reanalysis was performed outside of holding time; therefore, the entire data set of target analytes in the reanalysis sample were labeled as do-not-report (DNR) and should not be used for any purpose.

6.0 CONCLUSIONS

Groundwater monitoring activities representing the first quarter of 2015 occurred at the North 1st Street site on March 10, 2015. Depth to groundwater ranged from 11.26 feet (N1MW-4) to 14.05 feet (N1MW-1) below the top of well casing. Groundwater elevations ranged from about 1,070.51 feet in N1MW-2 to 1,070.87 feet in N1MW-4 and N1MW-5; elevations decreased an average of approximately 0.3 feet, as measured in the five site wells, relative to the previous monitoring event. Groundwater elevations at the site indicated groundwater flow in the shallow unconfined aquifer beneath the property generally was toward the east.

Site contaminants of concern were not detected at concentrations exceeding MTCA Method A cleanup criteria in groundwater samples obtained during the March 2015 groundwater monitoring event. GRPH was detected in N1MW-1 and N1MW-2 at concentrations less than the MTCA Method A cleanup criteria. DRPH was detected in N1MW-2 at a concentration less than the MTCA Method A cleanup criteria. Natural attenuation parameters indicate possible biodegradation of petroleum hydrocarbons is occurring near N1MW-2 and N1MW-5. These locations might be near the fringe of the documented groundwater plume from previous studies. Samples analyzed from the remaining monitoring wells were generally less than laboratory reporting limits for suspected petroleum-based contaminants.

7.0 LIMITATIONS

We have prepared this report for the exclusive use of Ecology and their authorized agents.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments should be considered a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to "Report Limitations and Guidelines for Use," Appendix C, for additional information pertaining to use of this report.

8.0 REFERENCES

GeoEngineers, Inc., 2014a. "Sampling and Analysis Plan, Soil and Groundwater Assessment." Three Tiger Oil Sites, Yakima, Washington. GEI File No. 0504-101-00, April 15.

GeoEngineers, Inc., 2014b. "Tiger Oil Work Plan Amendment Monitoring Wells." Three Tiger Oil Sites, Yakima, Washington. GEI File No. 0504-101-00, July 21.

GeoEngineers, Inc., 2014c. "Phase II Site Assessment Report." Tiger Oil - North 1st, Yakima, Washington. GEI File No. 0504-101-00, February 11.

McCreedy, Re: Tiger Oil Corporation. 2005. 1808 North First Street (North First) and 1606 East Nob Hill Blvd., Yakima, Washington. Letter to Alex Smith, Assistant Attorney General, Ecology Division and Thomas L. Mackie, Hydrogeologist Site Manager, Toxics Cleanup Program, Department of Ecology. April 9.

Puls, R. W. and M. J. Barcelona. 1996. Low-flow (Minimal Drawdown) Ground-water Sampling Procedures: EPA Ground Water Issue, April, p.1-9.

Tetra Tech, 2005, "UST Decommissioning and Site Assessment at Tiger Oil Corporation Facility, 1808 First Avenue, Yakima, Washington," March 17.

U.S. Environmental Protection Agency (EPA). 1996. Region 1, "Low Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells," EPA SOP No. GW 0001, Revision No. 2. July 30.

U.S. Environmental Protection Agency. 2008. "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June.

U.S. Environmental Protection Agency. 2009. "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January.

U.S. Environmental Protection Agency. 2010. "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January.

Wagner, Richard J., Ebbert, J.C. 1991. "Changes Between 1984 and 1989 in the Concentration and Aerial Extent of Ground-Water Contamination from a Gasoline and Diesel Fuel Leak at a Site in Yakima, Washington," United States Geological Survey (USGS), Preliminary Draft, April 10.

TABLES

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Table 1

Summary of Groundwater Field Parameters[1]

Tiger Oil North 1st

Yakima, Washington

Well Number	Date Collected	pH	Temperature (°C)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP - Field[2] (mV)	ORP - Normalized[3] (mV)	Turbidity (NTU)	Soluble Ferrous Iron (mg/L)	Monitoring Well Headspace[4] (ppm)
N1MW-1	09/18/14	6.57	17.03	0.25	2.46	54	256	16.31	1.25	1.5
	12/11/14	6.59	16.99	0.23	1.04	13	215	1.15	1.0	1.5
	03/10/15	6.76	15.29	0.24	4.33	519	722	2.42	1.25	0.3
N1MW-2	09/18/14	6.69	17.46	0.27	0.05	-143	59	1.03	0	0.0
	12/11/14	6.49	16.50	0.25	0.14	-90	112	4.13	0	0.0
	03/10/15	6.72	13.17	0.23	0.06	44	249	4.54	0	0.0
N1MW-3	09/18/14	6.75	16.25	0.26	5.69	-148	55	0.07	0	0.3
	12/11/14	6.65	16.32	0.24	6.32	142	345	0.86	0	0.3
	03/10/15	6.82	14.08	0.22	8.07	230	434	0.34	0	0.0
N1MW-4	09/18/14	6.68	16.77	0.24	5.82	90	292	4.48	0	0.1
	12/11/14	6.65	15.83	0.21	6.77	135	338	0.59	0	0.1
	03/10/15	6.82	13.83	0.21	8.63	267	472	4.90	0	0.0
N1MW-5	09/18/14	6.49	18.25	0.25	0.98	-25	176	0.12	1.5	0.1
	12/11/14	6.53	17.01	0.23	0.90	-24	178	2.35	2.0	0.1
	03/10/15	6.61	13.95	0.23	0.42	132	337	2.17	1.3	0.4

Notes:

[1]Reported water quality parameters reflect stabilized conditions at the conclusion of well purging during low-flow sampling.

[2]Field ORP values are relative to the reference electrode associated with the multi-parameter meter.

[3]Normalized ORP values have been normalized, using algorithms provided by the instrument manufacturer, to the standard hydrogen electrode (SHE).

[4]Well headspace measurements were obtained using a photoionization detector immediately upon removal of the well's compression cap.

ORP = Oxidation-reduction potential; °C = degrees Celsius; mS/cm = millisiemens per centimeter; mg/L = milligrams per liter; mV = millivolts; NTU = nephelometric turbidity units

ppm = parts per million

Table 2

Summary of Groundwater Level Measurements

Tiger Oil North 1st

Yakima, Washington

Well Number	Grid Northing[1] (feet)	Grid Easting[1] (feet)	Top of Casing Elevation[2] (feet)	Screen Elevation[2] (feet)	Date Measured	Depth to Groundwater[3] (feet)	Groundwater Elevation[2] (feet)	Change in Groundwater Elevation[4] (feet)
N1MW-1	470569.0	1637341.4	1,084.85	1075.4 to 1065.4	09/18/14	13.78	1,071.07	NA
					12/11/14	13.65	1,071.20	0.13
					03/10/15	14.05	1,070.80	-0.40
N1MW-2	470616.9	1637480.0	1,083.81	1073.8 to 1063.8	09/18/14	13.31	1,070.50	NA
					12/11/14	13.01	1,070.80	0.30
					03/10/15	13.30	1,070.51	-0.29
N1MW-3	470475.5	1637358.7	1,084.61	1074.6 to 1064.6	09/18/14	13.75	1,070.86	NA
					12/11/14	13.56	1,071.05	0.19
					03/10/15	13.86	1,070.75	-0.30
N1MW-4	470595.3	1637199.9	1,082.13	1075.1 to 1065.1	09/18/14	11.10	1,071.03	NA
					12/11/14	10.91	1,071.22	0.19
					03/10/15	11.26	1,070.87	-0.35
N1MW-5	470681.7	1637363.0	1,083.43	1074.4 to 1064.4	09/18/14	12.48	1,070.95	NA
					12/11/14	12.27	1,071.16	0.21
					03/10/15	12.56	1,070.87	-0.29

Notes:

[1]Grid northing and easting are referenced to the North American Datum of 1983 (NAD83), Washington State Plane Coordinate System, South Zone.

[2]Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).

[3]Depth to water measurements obtained from the north side of the top of PVC well casing.

[4]Represents change in groundwater elevation from previous monitoring event, as measured in monitoring wells.

NA = Not Applicable

Table 3

Summary of Chemical Analytical Results - Groundwater[1]

Tiger Oil North 1st

Yakima, Washington

Well ID	Regulatory Levels[2]	N1MW-1			Duplicate (N1MW-1)	N1MW-2			N1MW-3			N1MW-4			N1MW-5		
Date Sampled		09/18/14	12/11/14	03/10/15	03/10/15	09/18/14	12/11/14	03/10/15	09/18/14	12/11/14	03/10/15	09/18/14	12/11/14	03/10/15	09/18/14	12/11/14	03/10/15
Method NWTPH-Gx - Gasoline Range (µg/L)																	
Gasoline-range hydrocarbons	800/1,000[3]	**256**	<100	**120**	**110**	**506**	**372**	**340**	<100	<100	<100	<100	<100	<100	<100	<100	<100
Method NWTPH-Dx - Diesel Range (µg/L)																	
Diesel-range hydrocarbons	500	<0.234	<233	<230	<230	**459**	**269 J**	**280**	<231	<234	<240	<232	<232	<240	**238**	<234	<230
Diesel-range hydrocarbons w/silica gel	500	NT	NT	<230	<230	<229	**247 J**	**230**	NT	NT	<240	NT	NT	<240	<230	NT	<230
Heavy oil-range hydrocarbons	500	<0.389	<388	<380	<390	<382	<383	<390	<386	<389	<390	<386	<387	<390	<384	<391	<380
Heavy oil-range hydrocarbons w/silica gel	500	NT	NT	<380	<390	<382	<383	<390	NT	NT	<390	NT	NT	<390	<384	NT	<380
Method EPA 8011 - EDB (µg/L)																	
1,2-Dibromoethane (EDB)	0.01	NT	<0.0100	<0.010	<0.010	NT	<0.0100	<0.010	NT	<0.0100	<0.010	NT	<0.0100	<0.010	NT	<0.0100	<0.010
Method EPA 8260C - VOCs (µg/L)[4]																	
1,2-Dichloroethane (EDC)	5	<1.00	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
1,2,4-Trimethylbenzene	NE	**4.12**	<1.00	**5.0 J**	**3.4 J**	**1.08**	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
1,3,5-Trimethylbenzene	80[5]	**1.21**	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
2-Butanone	4,800[5]	<10.0	<10.0	<10	<10	<10.0	**16.2**	**19**	<10.0	<10.0	<10	<10.0	<10.0	<10	<10.0	<10.0	<10
Acetone	7,200[5]	**26.2**	<25.0	<25	<25	<25.0	<25.0	<25	<25.0	<25.0	<25	<25.0	<25.0	<25	<25.0	<25.0	<25
Benzene	5	<0.200	<0.200	<0.20	<0.20	<0.200	<0.200	<0.20	<0.200	<0.200	<0.20	<0.200	<0.200	<0.20	<0.200	<0.200	<0.20
Ethylbenzene	700	<1.00	<1.00	<1.0	<1.0	**5.17**	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
Hexane	480[5]	**5.01**	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
Isopropylbenzene	NE	<1.00	<1.00	<1.0	<1.0	**5.69**	**4.59**	**2.6**	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
Methyl t-butyl ether (MTBE)	20	<1.00	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
n-Butylbenzene	400[5]	<1.00	<1.00	<1.0	<1.0	**4.92**	<1.00	**2.2**	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
n-Propylbenzene	800[5]	<1.00	<1.00	**1.9**	**1.7**	**15.2**	**2.56**	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	**1.22**	**1.78**	<1.0
Naphthalene	160	<2.00	<2.00	<2.0	<2.0	**3.15**	<2.00	<2.0	<2.00	<2.00	<2.0	<2.00	<2.00	<2.0	<2.00	<2.00	<2.0
sec-Butylbenzene	800[5]	<1.00	<1.00	<1.0	<1.0	**2.80**	**3.24**	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	**1.21**	<1.0
Toluene	1,000	<1.00	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
Xylene, m-,p-	1,000[6]	<2.00	<2.00	<2.0	<2.0	<2.00	<2.00	<2.0	<2.00	<2.00	<2.0	<2.00	<2.00	<2.0	<2.00	<2.00	<2.0
Xylene, o-		<1.00	<1.00	<1.0	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0	<1.00	<1.00	<1.0
Xlylene, total		<3.00	<3.00	<3.0	<3.0	<3.00	<3.00	<3.0	<3.00	<3.00	<3.0	<3.00	<3.00	<3.0	<3.00	<3.00	<3.0
Metals Method EPA 200.7 - Total Lead (mg/L)																	
Lead	0.015	NT	<0.0140	<0.014	<0.014	NT	<0.0140	<0.014	NT	<0.0140	<0.014	NT	<0.0140	<0.014	NT	<0.0140	<0.014
Conventionals (mg/L)																	
Nitrate-nitrogen	10[7]	**0.840**	**0.610**	**0.78**	**0.76**	<0.200	<0.200	<0.20	**1.24**	**0.740**	**0.86**	**0.950**	**0.620**	**1.1**	**0.490**	**0.350**	**0.51**
Sulfate	250[8]	**9.69**	**7.90**	**8.8**	**9.4**	**5.25**	**5.50**	**5.7**	**10.1**	**8.25**	**8.5**	**8.49**	**6.92**	**8.2**	**9.68**	**9.25**	**13**
Total organic carbon	NE	**1.55**	**1.05**	**1.0**	**1.0**	**1.66**	**1.41**	**1.1**	**1.22**	<1.00	<1.0	**1.19**	<1.00	**1.0**	**1.36**	**1.09**	**1.1**

Notes:

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Regulatory level refers to Washington State Model Toxics Control Act (MTCA) Method A cleanup level unless otherwise footnoted.

[3]Cleanup level for Gasoline-range petroleum hydrocarbons (GRPH) is 800 µg/L when benzene is present, 1,000 µg/L when benzene is not present.

[4]Volatile organic compounds (VOCs) detected at concentrations greater than their reporting limits, and benzene, toluene, ethylbenzene and xylenes (BTEX), are listed in the table. For a complete list of VOCs analyzed see the laboratory analytical report, Appendix B.

[5]MTCA Method B cleanup level.

[6]Cleanup level for total xylenes.

[7]Maximum contaminant level established by Title 40, Volume 19 of the Code of Federal Regulations.

[8]Secondary maximum contaminant level recommeded by the Environmental Protection Agency.

J flag indicates results are qualified as estimated. B flag indicates analyte was detected both in the sample and in the blank. U flag indicates analyte was qualified as non-detect. See data validation report for additional information.

Bold indicates analyte concentration exceeds laboratory reporting limit.

µg/L = micrograms per liter; mg/L = milligrams per liter; NT = not tested; NE = not established

Table 4

Summary of Chemical Analytical Results - Groundwater PAHs[1]

Tiger Oil North 1st

Yakima, Washington

		Carcinogenic PAHs																		
		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ[2]	Naphthalene	2-Methylnaphthalene	1-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(ghi)perylene
	TEF[2]	0.1	1.0	0.1	0.1	0.01	0.1	0.1												
Sample ID	Date Collected	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N1MW-1	09/18/14	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	0.06	**0.242**	**0.487**	**0.400**	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858
	03/10/15	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	0.06	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084
Duplicate (N1MW-1)	09/18/14	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	0.07	**0.331**	**0.629**	**0.503**	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893
	03/10/15	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	0.06	<0.085 U	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
N1MW-2	09/18/14	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	0.06	**3.24**	<0.0847	**10.1**	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847
	03/10/15	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	0.06	**1.1**	<0.085	**2.6**	<0.085	**0.085**	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085
N1MW-3	09/18/14	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	0.06	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850
	03/10/15	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	0.06	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085
N1MW-4	09/18/14	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	0.06	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854
	03/10/15	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	0.06	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085	<0.085
N1MW-5	09/18/14	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	0.06	**0.550**	<0.0847	**0.410**	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847
	03/10/15	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	0.06	<0.23 U	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084	<0.084
MTCA Method A Unrestricted Land Use CUL[3]		NE	0.1	NE	NE	NE	NE	NE	0.1[4]	160[5]			NE	NE	NE	NE	NE	NE	NE	NE

Notes:

[1]Polycyclic aromatic hydrocarbons (PAHs) analyzed using EPA Method 8270D by TestAmerica Laboratories, Inc., in Spokane, Washington.

[2]Carcinogenic PAH (cPAH) toxic equivalency (TEQ) calculated using toxicity equivalency factors (TEF) from MTCA Table 708-2, based on methodology described in MTCA Cleanup Regulation WAC 173-340-708. One half the reporting limit was used to calculate the TEQ.

[3]Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels.

[4]MTCA Method A cleanup level for benzo(a)pyrene.

[5]Cleanup level for total naphthalenes

µg/L = micrograms per liter; NE = Not Established.

Bold indicates analyte concentration exceeds laboratory reporting limit.

U flag indicates analyte was qualified as non-detect. See data validation report for additional information.

FIGURES

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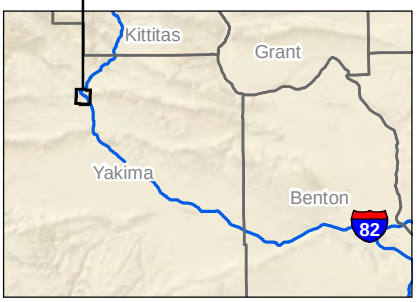

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Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
Data Sources: ESRI Data & Maps, Street Maps 2008.
Base map from ESRI Data Online.
Projection: NAD 1983, UTM Zone 10 North.

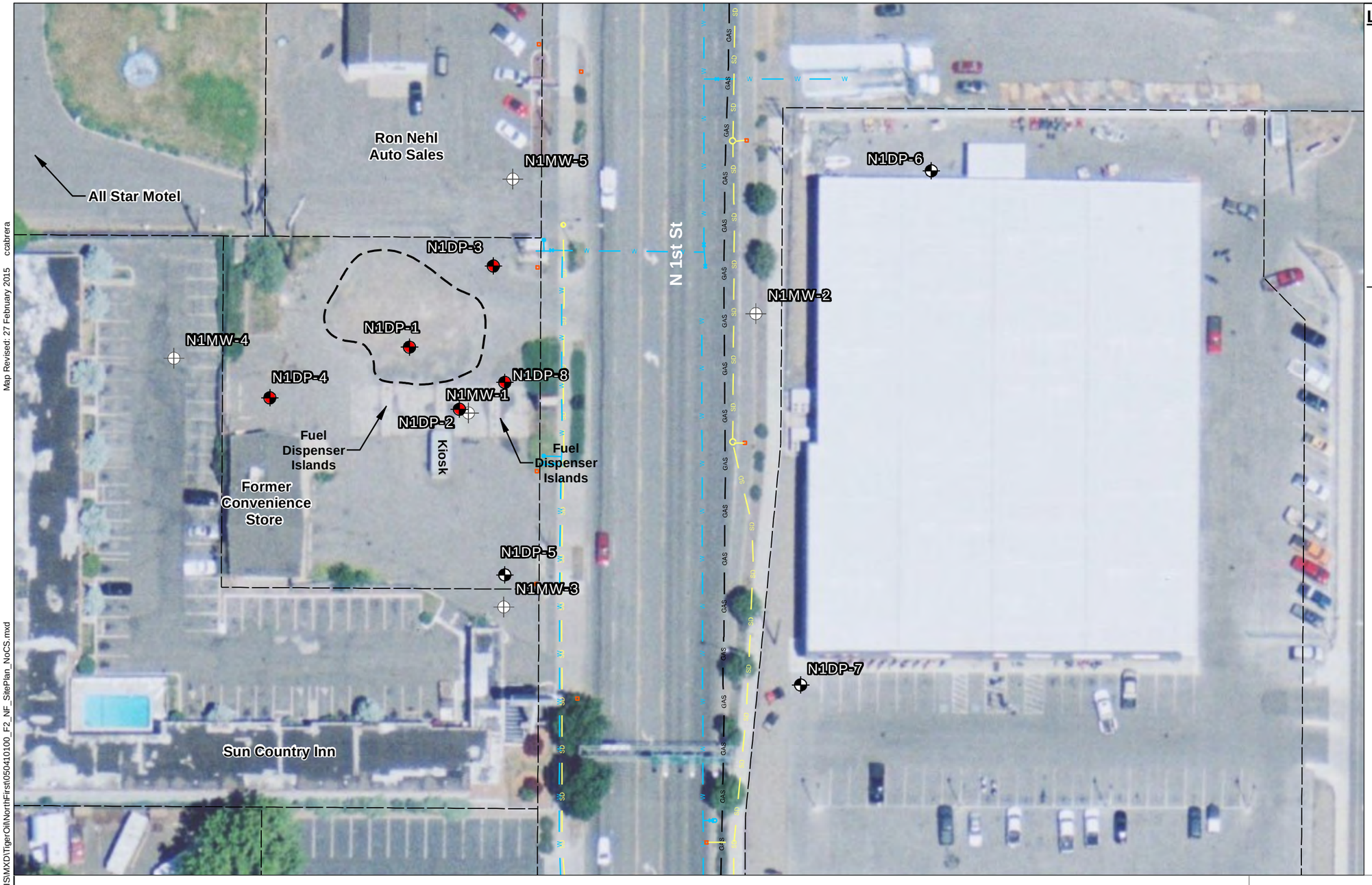
Vicinity Map

Tiger Oil North 1st
Yakima, Washington

GeoEngineers

Figure 1

Map Revised: 11 September 2014 ccabrera
Path: P:\0\0504101_GIS\MXD\050410100_F1_VM_N1.mxd
Office: PORT



Legend

- N1DB-6 — Boring Number and Approximate Location
- N1MW-1 — Monitoring Well Number and Approximate Location
- GRPH, BTEX, or Naphthalene Concentrations in Soil Greater Than MTCA Method A Cleanup Levels
- Approximate Former Tank Pit Location
- Approximate Parcel Boundary

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Feet

Data Source: Aerial base from ArcGIS Online.
Parcel and utility cad base data provided by
City of Yakima Engineering Department, January 2015.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Site Plan and Sample Locations

Tiger Oil North 1st
Yakima, Washington

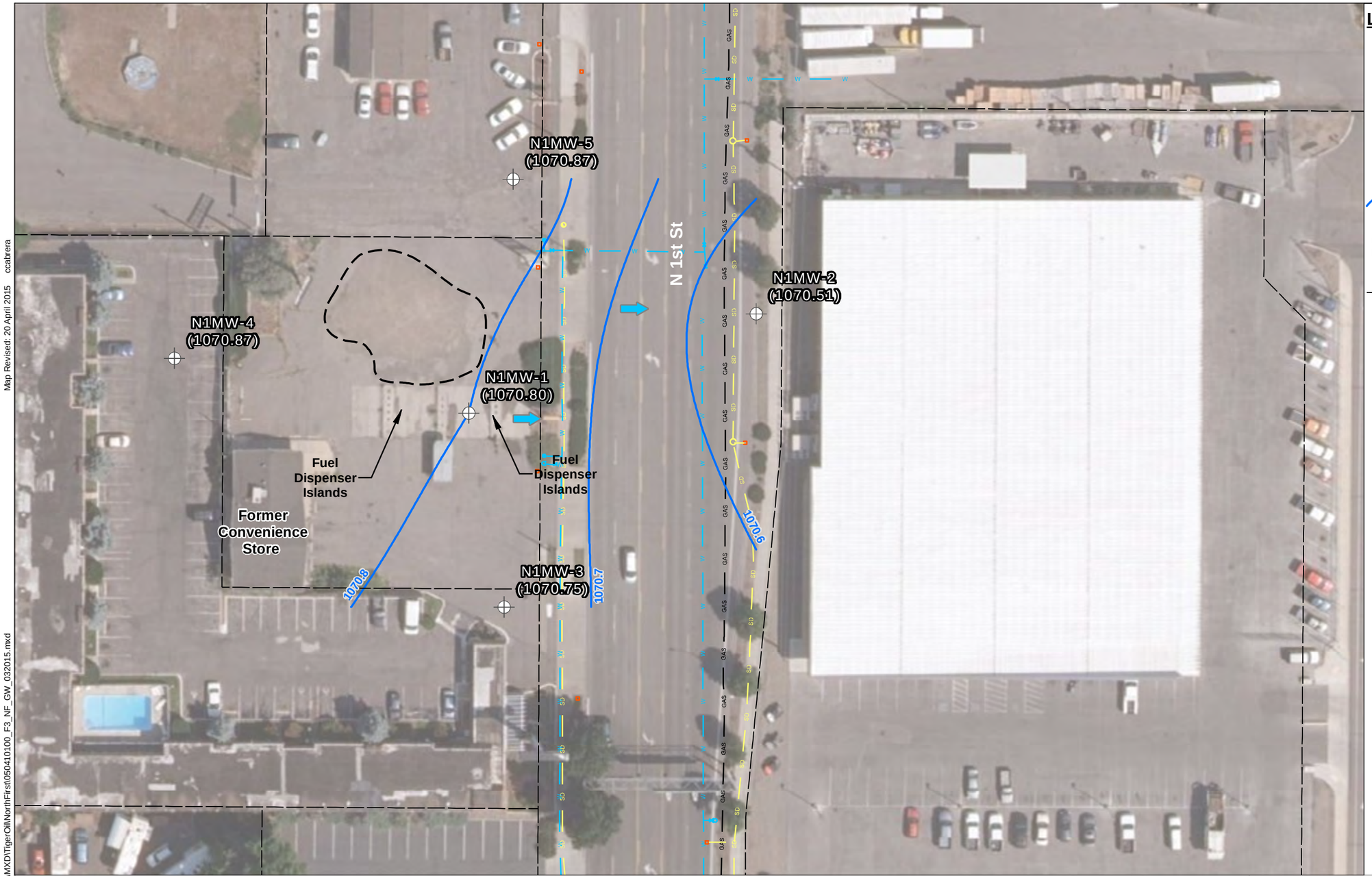
GeoEngineers

Figure 2

Map Revised: 27 February 2015 ccabrera

Path: P:\00504101_GIS\MXD\TigerOilNorthFirst\0504101100_F2_NF_SitePlan_NoCS.mxd

Office: PORT



Legend

- N1MW-1 (1,070.80) — Approximate Groundwater Monitoring Well Location and Groundwater Elevation on March 10, 2015
- Estimated Groundwater Flow Direction
- 1070.6 — Approximate Groundwater Elevation Contours (0.1-foot Interval)
- Approximate Former Tank Pit Location
- Approximate Parcel Boundary

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Feet

Data Source: Aerial base from ArcGIS Online.
Parcel and utility cad base data provided by
City of Yakima Engineering Department, January 2015.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Groundwater elevations are referred to the North American Vertical Datum of 1988 (NAVD 88).
4. Groundwater elevations contours interpreted by Surfer Version 12.

Groundwater Elevation and Interpreted Flow Direction, March 10, 2015

Tiger Oil North 1st
Yakima, Washington

GeoEngineers

Figure 3

Map Revised: 20 April 2015 ccabrera

Office: PORT Path: P:\005041\01_GIS\MXD\TigerOilNorthFirst\050410100_F3_NF_GW_032015.mxd

APPENDICES

GeoEngineers

APPENDIX A
Field Procedures

APPENDIX A
FIELD PROCEDURES

General

Groundwater conditions at the Tiger Oil North 1st site were monitored on March 10, 2015 by measuring depth to groundwater and sampling groundwater in monitoring wells N1MW-1 through N1MW-5, which are situated at the approximate locations shown on Figures 2 and 3. Field methods generally were performed in compliance with the project Work Plan dated April 15, 2014 (GeoEngineers, 2014a).

Groundwater Elevations

Depths to groundwater were measured relative to the north side of the monitoring well casing rim using an electric water level indicator. The probe of the water level indicator was decontaminated between wells using a detergent wash, followed by two distilled water rinses.

Low-Flow Sampling Procedures

Groundwater sampling was performed consistent with the EPA's low-flow groundwater sampling procedure, as described by EPA (1996) and Puls and Barcelona (1996). Monitoring well purging and sampling activities were accomplished using a Cole-Parmer Masterflex or GeoTech Environmental peristaltic pump and dedicated tubing. During purging activities, water quality parameters, including pH, conductivity, temperature, ORP and DO, were measured using a Troll 9500 multi-parameter meter equipped with a flow-through cell. Water quality measurements were recorded approximately every 3 minutes. The meter calibration was verified at the beginning of each work day consistent with manufacturer recommendations prior to purging and sampling activities.

Groundwater samples were collected after (1) water quality parameters had stabilized; or (2) a maximum purge time of 30 minutes was achieved. During purging and sampling, purge rate was not allowed to exceed 500 milliliters per minute. Water quality parameter stabilization criteria include the following:

- Turbidity: ±10 percent for values greater than 5 nephelometric turbidity units (NTU);
- Dissolved oxygen: ±10 percent for values greater than 0.5 mg/L;
- Conductivity: ±3 percent;
- Temperature: ±3 percent; and
- Oxidation reduction potential: ±10 millivolts (mV).

After groundwater quality stabilization criteria or maximum purge time were reached, the pump's discharge tubing was disconnected from the flow-through cell and groundwater samples were collected for analysis. Each sample was pumped directly into sample containers supplied by the laboratory. Groundwater samples collected for chemical analysis were kept cool during on-site storage and transport to the laboratory. Chain-of-custody procedures were observed during transport of the groundwater samples.

APPENDIX B
Chemical Analytical Laboratory Report and Data Validation

APPENDIX B
CHEMICAL ANALYTICAL LABORATORY REPORT AND DATA VALIDATION

Project:	Tiger Oil – North 1st Street First Quarter 2015 Groundwater Samples
GEI File No:	00504-101-00
Date:	April 13, 2015

General

This report documents the results of a United States EPA-defined Stage 2A data validation (EPA Document 540-R-08-005; EPA, 2009) of analytical data from the analyses of groundwater samples collected as part of the March 2015 sampling event, and the associated laboratory and field quality control samples. The samples were obtained from the Tiger Oil, North 1st Street Site located at 1808 North 1st Street in Yakima, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers completed the data validation consistent with the EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA, 2008) and Inorganic Superfund Data Review (EPA, 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The QA/QC procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with Quality Assurance Project Plan (Appendix A of the Sampling and Analysis Plan, Soil and Groundwater Assessment; GeoEngineers, 2014a), the data validation included review of the following QC elements:

- Data package completeness
- Chain-of-custody documentation
- Holding times and sample preservation
- Surrogate recoveries
- Method and trip blanks
- Matrix spikes/matrix spike duplicates
- Laboratory control samples/laboratory control sample duplicates
- Field duplicates

- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the SDG listed below in Table B-1.

TABLE B-1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
590-398-1	MW-1-031015, MW-Dup-031015, MW-2-031015, MW-3-031015, MW-4-031015, MW-5-031015, Trip Blank

CHEMICAL ANALYSIS PERFORMED

TestAmerica, located in Spokane, Washington, performed laboratory analyses on the groundwater samples using the following methods:

- Petroleum hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Petroleum hydrocarbons with silica gel (SG) cleanup (NWTPH-Dx/SG) by Method NWTPH-Dx/SG;
- GRPH (NWTPH-Gx) by Method NWTPH-Gx;
- VOCs by Method SW8260C;
- EDB by Method SW8011;
- PAHs by Method SW8270D-SIM;
- Total metals by Method EPA200.7;
- Anions by Method EPA300.0; and
- TOC by Method SM5310C

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

TestAmerica provided all required deliverables for the data validation according to the National Functional Guidelines. The laboratory appears to have followed adequate corrective action processes; however, the laboratory analytical report does not contain a case narrative.

Chain-of-Custody Documentation

COC forms were provided with the laboratory analytical report. The COCs were accurate and complete when submitted to the laboratory, with the following exception:

SDG 590-398-1: The laboratory noted that the trip blank sample was not written on the COC.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for all analyses. The sample coolers arrived at the laboratory within the appropriate temperatures of between 2 and 6 degrees Celsius.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. All surrogate percent recoveries for field samples were within the laboratory control limits.

Method and Trip Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For all sample batches, method blanks for all applicable methods were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in any of the method blanks, with following exception:

SDG 590-398-1: (PAHs) There was a positive result for naphthalene in the method blank extracted on March 16, 2015. The associated field samples, MW-5-031015 and MW-Dup-031015 exhibited a positive result for this analyte. The positive results for naphthalene were qualified as non-detected (U) in these samples.

In cases were target analytes are qualified as non-detected because of blank contamination, the new reporting limit is elevated to the level of the former concentration reported in the sample.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. None of the target analytes were detected above the reporting limits in the trip blank.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is

calculated. The percent recovery control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

For inorganic methods, the matrix spike is followed by a post-digestion spike sample if any element percent recoveries were outside the control limits in the matrix spike. The percent recovery control limits for matrix spikes are 75 to 125 percent.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A LCS is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/laboratory control sample duplicate (LCSD) control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits, with the following exception:

SDG 590-398-1: (VOCs) The percent recovery for acetone was greater than the control limits in the LCS extracted on March 12, 2015. There were no positive results for this target analyte in the associated field samples; therefore, no action was required for this outlier.

Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit is 20 percent.

SDG 590-398-1: One field duplicate sample pair, MW-1-031015 and MW-Dup-031015, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair, with the exception of 1,2,4-Trimethylbenzene. The positive results for this target analyte were qualified as estimated (J) in this sample pair.

MISCELLANEOUS

SDG 590-398-1: (PAHs) The laboratory reported two sets of PAH results for Samples MW-5-031015 and MW-Dup-031015, an initial and a reanalysis, due to a method blank detection of naphthalene and positive results for this analyte in these samples. The reanalysis was performed outside of holding time; therefore,

the entire data set of target analytes in the reanalysis sample were labeled as DNR and should not be used for any purpose.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS percent recovery values, with the exception noted above. Precision was acceptable, as demonstrated by the LCS/LCSD and field duplicate RPD values, with the exception noted above.

All data are acceptable for the intended use, with the following qualifications listed below in Table B-2.

TABLE B-2: SUMMARY OF QUALIFIED SAMPLES

Sample ID	Analyte	Qualifier	Result
MW-1-031015	1,2,4-Trimethylbenzene	J	Field Duplicate RPD
MW-5-031015	Naphthalene	U	Method Blank Contamination
MW-Dup-031015	Naphthalene 1,2,4-Trimethylbenzene	U J	Method Blank Contamination Field Duplicate RPD

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

TestAmerica Job ID: 590-398-1
Client Project/Site: Tiger Oil NIST

For:
GeoEngineers Inc
523 East Second Ave
Spokane, Washington 99202

Attn: JR Sugalski

Authorized for release by:
4/3/2015 10:34:39 AM

Michelle Johnston, Project Manager II
(303)736-0110
michelle.johnston@testamericainc.com

Table of Contents

Sample Summary

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-398-1	MW-1-031015	Water	03/10/15 12:05	03/11/15 09:50
590-398-2	MW-2-031015	Water	03/10/15 08:54	03/11/15 09:50
590-398-3	MW-3-031015	Water	03/10/15 09:48	03/11/15 09:50
590-398-4	MW-4-031015	Water	03/10/15 10:23	03/11/15 09:50
590-398-5	MW-5-031015	Water	03/10/15 11:15	03/11/15 09:50
590-398-6	MW-DUP-031015	Water	03/10/15 12:00	03/11/15 09:50
590-413-1	MW-1-031015	Water	03/10/15 12:05	03/12/15 09:05
590-413-2	MW-2-031015	Water	03/10/15 08:54	03/12/15 09:05
590-413-3	MW-3-031015	Water	03/10/15 09:48	03/12/15 09:05
590-413-4	MW-4-031015	Water	03/10/15 10:23	03/12/15 09:05
590-413-5	MW-5-031015	Water	03/10/15 11:15	03/12/15 09:05
590-413-6	MW-Dup-031015	Water	03/10/15 12:00	03/12/15 09:05
590-413-7	Trip Blank	Water	03/10/15 08:54	03/12/15 09:05

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD exceeds the control limits

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time
*	LCS or LCSD exceeds the control limits

Glossary

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

Client Sample ID: MW-1-031015 — **Lab Sample ID: 590-398-1**
Date Collected: 03/10/15 12:05 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.78		0.20		mg/L			03/11/15 12:52	1
Sulfate	8.8		0.50		mg/L			03/11/15 12:52	1

Client Sample ID: MW-2-031015 — **Lab Sample ID: 590-398-2**
Date Collected: 03/10/15 08:54 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			03/11/15 13:06	1
Sulfate	5.7		0.50		mg/L			03/11/15 13:06	1

Client Sample ID: MW-3-031015 — **Lab Sample ID: 590-398-3**
Date Collected: 03/10/15 09:48 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.86		0.20		mg/L			03/11/15 13:20	1
Sulfate	8.5		0.50		mg/L			03/11/15 13:20	1

Client Sample ID: MW-4-031015 — **Lab Sample ID: 590-398-4**
Date Collected: 03/10/15 10:23 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.1		0.20		mg/L			03/11/15 13:34	1
Sulfate	8.2		0.50		mg/L			03/11/15 13:34	1

Client Sample ID: MW-5-031015 — **Lab Sample ID: 590-398-5**
Date Collected: 03/10/15 11:15 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.51		0.20		mg/L			03/11/15 13:48	1
Sulfate	13		0.50		mg/L			03/11/15 13:48	1

Client Sample ID: MW-DUP-031015 — **Lab Sample ID: 590-398-6**
Date Collected: 03/10/15 12:00 — **Matrix: Water**
Date Received: 03/11/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.76		0.20		mg/L			03/11/15 14:31	1
Sulfate	9.4		0.50		mg/L			03/11/15 14:31	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-1-031015
Date Collected: 03/10/15 12:05
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 15:39	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 15:39	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 15:39	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
1,2,4-Trimethylbenzene	**5.0**		1.0		ug/L			03/12/15 15:39	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 15:39	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 15:39	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 15:39	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 15:39	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 15:39	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 15:39	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 15:39	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 15:39	1
2-Hexanone	ND		10		ug/L			03/12/15 15:39	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 15:39	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 15:39	1
Acetone	ND	*	25		ug/L			03/12/15 15:39	1
Benzene	ND		0.20		ug/L			03/12/15 15:39	1
Bromobenzene	ND		1.0		ug/L			03/12/15 15:39	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 15:39	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 15:39	1
Bromoform	ND		1.0		ug/L			03/12/15 15:39	1
Bromomethane	ND		5.0		ug/L			03/12/15 15:39	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 15:39	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 15:39	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 15:39	1
Chloroethane	ND		1.0		ug/L			03/12/15 15:39	1
Chloroform	ND		1.0		ug/L			03/12/15 15:39	1
Chloromethane	ND		3.0		ug/L			03/12/15 15:39	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 15:39	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 15:39	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 15:39	1
Dibromomethane	ND		1.0		ug/L			03/12/15 15:39	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 15:39	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 15:39	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 15:39	1
Hexane	ND		1.0		ug/L			03/12/15 15:39	1

Client Sample ID: MW-1-031015
Date Collected: 03/10/15 12:05
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 15:39	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 15:39	1
Methylene Chloride	ND		10		ug/L			03/12/15 15:39	1
Naphthalene	ND		2.0		ug/L			03/12/15 15:39	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
N-Propylbenzene	**1.9**		1.0		ug/L			03/12/15 15:39	1
o-Xylene	ND		1.0		ug/L			03/12/15 15:39	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 15:39	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
Styrene	ND		1.0		ug/L			03/12/15 15:39	1
tert-Butanol	ND		5.0		ug/L			03/12/15 15:39	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 15:39	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 15:39	1
Toluene	ND		1.0		ug/L			03/12/15 15:39	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 15:39	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 15:39	1
Trichloroethene	ND		1.0		ug/L			03/12/15 15:39	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 15:39	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 15:39	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 140*		*03/12/15 15:39*	*1*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*		*03/12/15 15:39*	*1*
Dibromofluoromethane (Surr)	*94*		*71.2 - 143*		*03/12/15 15:39*	*1*
Toluene-d8 (Surr)	*103*		*74.1 - 135*		*03/12/15 15:39*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**120**		100		ug/L			03/17/15 10:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*68.7 - 141*		*03/17/15 10:46*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
2-Methylnaphthalene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
1-Methylnaphthalene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Acenaphthylene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Acenaphthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Fluorene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Phenanthrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Benzo[a]anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Chrysene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Benzo[b]fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1

Client Sample ID: MW-1-031015

Lab Sample ID: 590-413-1

Date Collected: 03/10/15 12:05

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[k]fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Benzo[a]pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Indeno[1,2,3-cd]pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Dibenz(a,h)anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1
Benzo[g,h,i]perylene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 12:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 12:26*	*1*
2-Fluorobiphenyl (Surr)	*69*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 12:26*	*1*
p-Terphenyl-d14	*89*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 12:26*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 18:20	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 16:01	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		03/17/15 11:40	03/18/15 16:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:01*	*1*
n-Triacontane-d62	*86*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:01*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 19:55	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		03/17/15 11:40	03/18/15 19:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*03/17/15 11:40*	*03/18/15 19:55*	*1*
n-Triacontane-d62	*89*		*50 - 150*	*03/17/15 11:40*	*03/18/15 19:55*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.0**		1.0		mg/L			03/16/15 09:42	1

Client Sample ID: MW-2-031015

Lab Sample ID: 590-413-2

Date Collected: 03/10/15 08:54

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 16:02	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-2-031015
Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 16:02	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 16:02	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 16:02	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 16:02	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 16:02	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 16:02	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:02	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 16:02	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:02	1
2-Butanone (MEK)	**19**		10		ug/L			03/13/15 12:42	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:02	1
2-Hexanone	ND		10		ug/L			03/12/15 16:02	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:02	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 16:02	1
Acetone	ND	*	25		ug/L			03/12/15 16:02	1
Benzene	ND		0.20		ug/L			03/12/15 16:02	1
Bromobenzene	ND		1.0		ug/L			03/12/15 16:02	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 16:02	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 16:02	1
Bromoform	ND		1.0		ug/L			03/12/15 16:02	1
Bromomethane	ND		5.0		ug/L			03/12/15 16:02	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 16:02	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 16:02	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 16:02	1
Chloroethane	ND		1.0		ug/L			03/12/15 16:02	1
Chloroform	ND		1.0		ug/L			03/12/15 16:02	1
Chloromethane	ND		3.0		ug/L			03/12/15 16:02	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:02	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:02	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 16:02	1
Dibromomethane	ND		1.0		ug/L			03/12/15 16:02	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 16:02	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 16:02	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 16:02	1
Hexane	ND		1.0		ug/L			03/12/15 16:02	1
Isopropylbenzene	**2.6**		1.0		ug/L			03/12/15 16:02	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 16:02	1

Client Sample ID: MW-2-031015
Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 16:02	1
Methylene Chloride	ND		10		ug/L			03/12/15 16:02	1
Naphthalene	ND		2.0		ug/L			03/12/15 16:02	1
n-Butylbenzene	**2.2**		1.0		ug/L			03/12/15 16:02	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
o-Xylene	ND		1.0		ug/L			03/12/15 16:02	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 16:02	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
Styrene	ND		1.0		ug/L			03/12/15 16:02	1
tert-Butanol	ND		5.0		ug/L			03/12/15 16:02	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 16:02	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 16:02	1
Toluene	ND		1.0		ug/L			03/12/15 16:02	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:02	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:02	1
Trichloroethene	ND		1.0		ug/L			03/12/15 16:02	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 16:02	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 16:02	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 140*		*03/12/15 16:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 140*		*03/13/15 12:42*	*1*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*		*03/12/15 16:02*	*1*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*		*03/13/15 12:42*	*1*
Dibromofluoromethane (Surr)	*96*		*71.2 - 143*		*03/12/15 16:02*	*1*
Dibromofluoromethane (Surr)	*95*		*71.2 - 143*		*03/13/15 12:42*	*1*
Toluene-d8 (Surr)	*99*		*74.1 - 135*		*03/12/15 16:02*	*1*
Toluene-d8 (Surr)	*99*		*74.1 - 135*		*03/13/15 12:42*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**340**		100		ug/L			03/17/15 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*68.7 - 141*		*03/17/15 11:08*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**1.1**	**B**	0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
2-Methylnaphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
1-Methylnaphthalene	**2.6**		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Acenaphthylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Acenaphthene	**0.085**		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Fluorene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Phenanthrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Benzo[a]anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1

Client Sample ID: MW-2-031015
Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-2
Matrix: Water

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chrysene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Benzo[b]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Benzo[k]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Benzo[a]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Indeno[1,2,3-cd]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Dibenz(a,h)anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1
Benzo[g,h,i]perylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 12:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 12:53*	*1*
2-Fluorobiphenyl (Surr)	*62*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 12:53*	*1*
p-Terphenyl-d14	*90*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 12:53*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 18:36	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**0.28**		0.23		mg/L		03/17/15 11:40	03/18/15 16:24	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:24*	*1*
n-Triacontane-d62	*91*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:24*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**0.23**		0.23		mg/L		03/17/15 11:40	03/18/15 20:19	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 20:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*96*		*50 - 150*	*03/17/15 11:40*	*03/18/15 20:19*	*1*
n-Triacontane-d62	*93*		*50 - 150*	*03/17/15 11:40*	*03/18/15 20:19*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0		mg/L			03/16/15 09:42	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-3-031015
Date Collected: 03/10/15 09:48
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 16:24	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 16:24	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 16:24	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 16:24	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 16:24	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 16:24	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:24	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 16:24	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:24	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 16:24	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:24	1
2-Hexanone	ND		10		ug/L			03/12/15 16:24	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:24	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 16:24	1
Acetone	ND	*	25		ug/L			03/12/15 16:24	1
Benzene	ND		0.20		ug/L			03/12/15 16:24	1
Bromobenzene	ND		1.0		ug/L			03/12/15 16:24	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 16:24	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 16:24	1
Bromoform	ND		1.0		ug/L			03/12/15 16:24	1
Bromomethane	ND		5.0		ug/L			03/12/15 16:24	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 16:24	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 16:24	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 16:24	1
Chloroethane	ND		1.0		ug/L			03/12/15 16:24	1
Chloroform	ND		1.0		ug/L			03/12/15 16:24	1
Chloromethane	ND		3.0		ug/L			03/12/15 16:24	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:24	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:24	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 16:24	1
Dibromomethane	ND		1.0		ug/L			03/12/15 16:24	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 16:24	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 16:24	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 16:24	1
Hexane	ND		1.0		ug/L			03/12/15 16:24	1

Client Sample ID: MW-3-031015
Date Collected: 03/10/15 09:48
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 16:24	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 16:24	1
Methylene Chloride	ND		10		ug/L			03/12/15 16:24	1
Naphthalene	ND		2.0		ug/L			03/12/15 16:24	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
o-Xylene	ND		1.0		ug/L			03/12/15 16:24	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 16:24	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
Styrene	ND		1.0		ug/L			03/12/15 16:24	1
tert-Butanol	ND		5.0		ug/L			03/12/15 16:24	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 16:24	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 16:24	1
Toluene	ND		1.0		ug/L			03/12/15 16:24	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:24	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:24	1
Trichloroethene	ND		1.0		ug/L			03/12/15 16:24	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 16:24	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 16:24	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 140*		*03/12/15 16:24*	*1*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*03/12/15 16:24*	*1*
Dibromofluoromethane (Surr)	*96*		*71.2 - 143*		*03/12/15 16:24*	*1*
Toluene-d8 (Surr)	*105*		*74.1 - 135*		*03/12/15 16:24*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			03/17/15 11:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*68.7 - 141*		*03/17/15 11:31*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
2-Methylnaphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
1-Methylnaphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Acenaphthylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Acenaphthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Fluorene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Phenanthrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Benzo[a]anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Chrysene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Benzo[b]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-3-031015

Lab Sample ID: 590-413-3

Date Collected: 03/10/15 09:48

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[k]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Benzo[a]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Indeno[1,2,3-cd]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Dibenz(a,h)anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1
Benzo[g,h,i]perylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 13:21*	*1*
2-Fluorobiphenyl (Surr)	*67*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 13:21*	*1*
p-Terphenyl-d14	*87*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 13:21*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 18:53	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 16:48	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 16:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:48*	*1*
n-Triacontane-d62	*89*		*50 - 150*	*03/17/15 11:40*	*03/18/15 16:48*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 20:42	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*03/17/15 11:40*	*03/18/15 20:42*	*1*
n-Triacontane-d62	*100*		*50 - 150*	*03/17/15 11:40*	*03/18/15 20:42*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0		mg/L			03/16/15 09:42	1

Client Sample ID: MW-4-031015

Lab Sample ID: 590-413-4

Date Collected: 03/10/15 10:23

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 16:47	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-4-031015
Date Collected: 03/10/15 10:23
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 16:47	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 16:47	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 16:47	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 16:47	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 16:47	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 16:47	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:47	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 16:47	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 16:47	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 16:47	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:47	1
2-Hexanone	ND		10		ug/L			03/12/15 16:47	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 16:47	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 16:47	1
Acetone	ND	*	25		ug/L			03/12/15 16:47	1
Benzene	ND		0.20		ug/L			03/12/15 16:47	1
Bromobenzene	ND		1.0		ug/L			03/12/15 16:47	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 16:47	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 16:47	1
Bromoform	ND		1.0		ug/L			03/12/15 16:47	1
Bromomethane	ND		5.0		ug/L			03/12/15 16:47	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 16:47	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 16:47	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 16:47	1
Chloroethane	ND		1.0		ug/L			03/12/15 16:47	1
Chloroform	ND		1.0		ug/L			03/12/15 16:47	1
Chloromethane	ND		3.0		ug/L			03/12/15 16:47	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:47	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:47	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 16:47	1
Dibromomethane	ND		1.0		ug/L			03/12/15 16:47	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 16:47	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 16:47	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 16:47	1
Hexane	ND		1.0		ug/L			03/12/15 16:47	1
Isopropylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 16:47	1

Client Sample ID: MW-4-031015
Date Collected: 03/10/15 10:23
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 16:47	1
Methylene Chloride	ND		10		ug/L			03/12/15 16:47	1
Naphthalene	ND		2.0		ug/L			03/12/15 16:47	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
o-Xylene	ND		1.0		ug/L			03/12/15 16:47	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 16:47	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
Styrene	ND		1.0		ug/L			03/12/15 16:47	1
tert-Butanol	ND		5.0		ug/L			03/12/15 16:47	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 16:47	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 16:47	1
Toluene	ND		1.0		ug/L			03/12/15 16:47	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 16:47	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 16:47	1
Trichloroethene	ND		1.0		ug/L			03/12/15 16:47	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 16:47	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 16:47	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 140*		*03/12/15 16:47*	*1*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*03/12/15 16:47*	*1*
Dibromofluoromethane (Surr)	*97*		*71.2 - 143*		*03/12/15 16:47*	*1*
Toluene-d8 (Surr)	*107*		*74.1 - 135*		*03/12/15 16:47*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			03/17/15 11:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*68.7 - 141*		*03/17/15 11:53*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
2-Methylnaphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
1-Methylnaphthalene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Acenaphthylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Acenaphthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Fluorene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Phenanthrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Benzo[a]anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Chrysene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Benzo[b]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Benzo[k]fluoranthene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Benzo[a]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1

Client Sample ID: MW-4-031015

Lab Sample ID: 590-413-4

Date Collected: 03/10/15 10:23

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Dibenz(a,h)anthracene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1
Benzo[g,h,i]perylene	ND		0.085		ug/L		03/16/15 10:37	03/17/15 13:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*88*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 13:48*	*1*
2-Fluorobiphenyl (Surr)	*76*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 13:48*	*1*
p-Terphenyl-d14	*92*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 13:48*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 19:10	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 17:11	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 17:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*93*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:11*	*1*
n-Triacontane-d62	*92*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:11*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 21:06	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:06*	*1*
n-Triacontane-d62	*96*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:06*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0		mg/L			03/16/15 09:42	1

Client Sample ID: MW-5-031015

Lab Sample ID: 590-413-5

Date Collected: 03/10/15 11:15

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 17:10	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-5-031015
Date Collected: 03/10/15 11:15
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 17:10	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 17:10	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 17:10	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 17:10	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 17:10	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 17:10	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:10	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 17:10	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:10	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 17:10	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:10	1
2-Hexanone	ND		10		ug/L			03/12/15 17:10	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:10	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 17:10	1
Acetone	ND	*	25		ug/L			03/12/15 17:10	1
Benzene	ND		0.20		ug/L			03/12/15 17:10	1
Bromobenzene	ND		1.0		ug/L			03/12/15 17:10	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 17:10	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 17:10	1
Bromoform	ND		1.0		ug/L			03/12/15 17:10	1
Bromomethane	ND		5.0		ug/L			03/12/15 17:10	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 17:10	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 17:10	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 17:10	1
Chloroethane	ND		1.0		ug/L			03/12/15 17:10	1
Chloroform	ND		1.0		ug/L			03/12/15 17:10	1
Chloromethane	ND		3.0		ug/L			03/12/15 17:10	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:10	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:10	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 17:10	1
Dibromomethane	ND		1.0		ug/L			03/12/15 17:10	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 17:10	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 17:10	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 17:10	1
Hexane	ND		1.0		ug/L			03/12/15 17:10	1
Isopropylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 17:10	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 17:10	1
Methylene Chloride	ND		10		ug/L			03/12/15 17:10	1

Client Sample ID: MW-5-031015
Date Collected: 03/10/15 11:15
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		2.0		ug/L			03/12/15 17:10	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
o-Xylene	ND		1.0		ug/L			03/12/15 17:10	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 17:10	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
Styrene	ND		1.0		ug/L			03/12/15 17:10	1
tert-Butanol	ND		5.0		ug/L			03/12/15 17:10	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 17:10	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 17:10	1
Toluene	ND		1.0		ug/L			03/12/15 17:10	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:10	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:10	1
Trichloroethene	ND		1.0		ug/L			03/12/15 17:10	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 17:10	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 17:10	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 17:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 140*		*03/12/15 17:10*	*1*
4-Bromofluorobenzene (Surr)	*105*		*68.7 - 141*		*03/12/15 17:10*	*1*
Dibromofluoromethane (Surr)	*100*		*71.2 - 143*		*03/12/15 17:10*	*1*
Toluene-d8 (Surr)	*100*		*74.1 - 135*		*03/12/15 17:10*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			03/17/15 12:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*68.7 - 141*		*03/17/15 12:15*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.23**	**B**	0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Naphthalene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
2-Methylnaphthalene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
2-Methylnaphthalene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
1-Methylnaphthalene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
1-Methylnaphthalene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Acenaphthylene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Acenaphthylene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Acenaphthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Acenaphthene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Fluorene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Fluorene	ND	H *	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Phenanthrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Phenanthrene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Anthracene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1

Client Sample ID: MW-5-031015
Date Collected: 03/10/15 11:15
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-5
Matrix: Water

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Pyrene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Benzo[a]anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Benzo[a]anthracene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Chrysene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Chrysene	ND	H *	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Benzo[b]fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Benzo[b]fluoranthene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Benzo[k]fluoranthene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Benzo[k]fluoranthene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Benzo[a]pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Benzo[a]pyrene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Indeno[1,2,3-cd]pyrene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Indeno[1,2,3-cd]pyrene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Dibenz(a,h)anthracene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Dibenz(a,h)anthracene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1
Benzo[g,h,i]perylene	ND		0.084		ug/L		03/16/15 10:37	03/17/15 14:16	1
Benzo[g,h,i]perylene	ND	H	0.083		ug/L		03/27/15 15:49	03/27/15 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*84*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 14:16*	*1*
Nitrobenzene-d5	*99*		*32.7 - 135*	*03/27/15 15:49*	*03/27/15 17:47*	*1*
2-Fluorobiphenyl (Surr)	*70*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 14:16*	*1*
2-Fluorobiphenyl (Surr)	*82*		*44.3 - 120*	*03/27/15 15:49*	*03/27/15 17:47*	*1*
p-Terphenyl-d14	*89*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 14:16*	*1*
p-Terphenyl-d14	*99*		*59.5 - 154*	*03/27/15 15:49*	*03/27/15 17:47*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 19:27	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 17:34	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		03/17/15 11:40	03/18/15 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:34*	*1*
n-Triacontane-d62	*83*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:34*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 21:29	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		03/17/15 11:40	03/18/15 21:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:29*	*1*

Client Sample ID: MW-5-031015

Lab Sample ID: 590-413-5

Date Collected: 03/10/15 11:15

Matrix: Water

Date Received: 03/12/15 09:05

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Triacontane-d62	*90*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:29*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0		mg/L			03/16/15 09:42	1

Client Sample ID: MW-Dup-031015

Lab Sample ID: 590-413-6

Date Collected: 03/10/15 12:00

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 17:32	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 17:32	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 17:32	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
1,2,4-Trimethylbenzene	**3.4**		1.0		ug/L			03/12/15 17:32	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 17:32	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 17:32	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 17:32	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:32	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 17:32	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:32	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 17:32	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:32	1
2-Hexanone	ND		10		ug/L			03/12/15 17:32	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:32	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 17:32	1
Acetone	ND	*	25		ug/L			03/12/15 17:32	1
Benzene	ND		0.20		ug/L			03/12/15 17:32	1
Bromobenzene	ND		1.0		ug/L			03/12/15 17:32	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 17:32	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 17:32	1
Bromoform	ND		1.0		ug/L			03/12/15 17:32	1
Bromomethane	ND		5.0		ug/L			03/12/15 17:32	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-Dup-031015
Date Collected: 03/10/15 12:00
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	ND		1.0		ug/L			03/12/15 17:32	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 17:32	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 17:32	1
Chloroethane	ND		1.0		ug/L			03/12/15 17:32	1
Chloroform	ND		1.0		ug/L			03/12/15 17:32	1
Chloromethane	ND		3.0		ug/L			03/12/15 17:32	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:32	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:32	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 17:32	1
Dibromomethane	ND		1.0		ug/L			03/12/15 17:32	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 17:32	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 17:32	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 17:32	1
Hexane	ND		1.0		ug/L			03/12/15 17:32	1
Isopropylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 17:32	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 17:32	1
Methylene Chloride	ND		10		ug/L			03/12/15 17:32	1
Naphthalene	ND		2.0		ug/L			03/12/15 17:32	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
N-Propylbenzene	**1.7**		1.0		ug/L			03/12/15 17:32	1
o-Xylene	ND		1.0		ug/L			03/12/15 17:32	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 17:32	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
Styrene	ND		1.0		ug/L			03/12/15 17:32	1
tert-Butanol	ND		5.0		ug/L			03/12/15 17:32	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 17:32	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 17:32	1
Toluene	ND		1.0		ug/L			03/12/15 17:32	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:32	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:32	1
Trichloroethene	ND		1.0		ug/L			03/12/15 17:32	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 17:32	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 17:32	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 17:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 140*		*03/12/15 17:32*	*1*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*		*03/12/15 17:32*	*1*
Dibromofluoromethane (Surr)	*102*		*71.2 - 143*		*03/12/15 17:32*	*1*
Toluene-d8 (Surr)	*101*		*74.1 - 135*		*03/12/15 17:32*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**110**		100		ug/L			03/17/15 12:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*68.7 - 141*		*03/17/15 12:38*	*1*

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-Dup-031015
Date Collected: 03/10/15 12:00
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-6
Matrix: Water

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.085**	**B**	0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Naphthalene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
2-Methylnaphthalene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
2-Methylnaphthalene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
1-Methylnaphthalene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
1-Methylnaphthalene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Acenaphthylene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Acenaphthylene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Acenaphthene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Acenaphthene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Fluorene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Fluorene	ND	H *	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Phenanthrene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Phenanthrene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Anthracene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Anthracene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Fluoranthene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Fluoranthene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Pyrene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Pyrene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Benzo[a]anthracene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Benzo[a]anthracene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Chrysene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Chrysene	ND	H *	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Benzo[b]fluoranthene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Benzo[b]fluoranthene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Benzo[k]fluoranthene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Benzo[k]fluoranthene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Benzo[a]pyrene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Benzo[a]pyrene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Indeno[1,2,3-cd]pyrene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Indeno[1,2,3-cd]pyrene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Dibenz(a,h)anthracene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Dibenz(a,h)anthracene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1
Benzo[g,h,i]perylene	ND		0.083		ug/L		03/16/15 10:37	03/17/15 14:44	1
Benzo[g,h,i]perylene	ND	H	0.085		ug/L		03/27/15 15:49	03/27/15 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*76*		*32.7 - 135*	*03/16/15 10:37*	*03/17/15 14:44*	*1*
Nitrobenzene-d5	*91*		*32.7 - 135*	*03/27/15 15:49*	*03/27/15 18:15*	*1*
2-Fluorobiphenyl (Surr)	*67*		*44.3 - 120*	*03/16/15 10:37*	*03/17/15 14:44*	*1*
2-Fluorobiphenyl (Surr)	*75*		*44.3 - 120*	*03/27/15 15:49*	*03/27/15 18:15*	*1*
p-Terphenyl-d14	*89*		*59.5 - 154*	*03/16/15 10:37*	*03/17/15 14:44*	*1*
p-Terphenyl-d14	*98*		*59.5 - 154*	*03/27/15 15:49*	*03/27/15 18:15*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 19:44	1

Client Sample ID: MW-Dup-031015

Lab Sample ID: 590-413-6

Date Collected: 03/10/15 12:00

Matrix: Water

Date Received: 03/12/15 09:05

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 17:58	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:58*	*1*
n-Triacontane-d62	*94*		*50 - 150*	*03/17/15 11:40*	*03/18/15 17:58*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		03/17/15 11:40	03/18/15 21:53	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		03/17/15 11:40	03/18/15 21:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:53*	*1*
n-Triacontane-d62	*84*		*50 - 150*	*03/17/15 11:40*	*03/18/15 21:53*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 10:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.0**		1.0		mg/L			03/16/15 09:42	1

Client Sample ID: Trip Blank

Lab Sample ID: 590-413-7

Date Collected: 03/10/15 08:54

Matrix: Water

Date Received: 03/12/15 09:05

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 17:55	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 17:55	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 17:55	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 17:55	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 17:55	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 17:55	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:55	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 17:55	1

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: Trip Blank
Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 17:55	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 17:55	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 17:55	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:55	1
2-Hexanone	ND		10		ug/L			03/12/15 17:55	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 17:55	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 17:55	1
Acetone	ND	*	25		ug/L			03/12/15 17:55	1
Benzene	ND		0.20		ug/L			03/12/15 17:55	1
Bromobenzene	ND		1.0		ug/L			03/12/15 17:55	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 17:55	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 17:55	1
Bromoform	ND		1.0		ug/L			03/12/15 17:55	1
Bromomethane	ND		5.0		ug/L			03/12/15 17:55	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 17:55	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 17:55	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 17:55	1
Chloroethane	ND		1.0		ug/L			03/12/15 17:55	1
Chloroform	ND		1.0		ug/L			03/12/15 17:55	1
Chloromethane	ND		3.0		ug/L			03/12/15 17:55	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:55	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:55	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 17:55	1
Dibromomethane	ND		1.0		ug/L			03/12/15 17:55	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 17:55	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 17:55	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 17:55	1
Hexane	ND		1.0		ug/L			03/12/15 17:55	1
Isopropylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 17:55	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 17:55	1
Methylene Chloride	ND		10		ug/L			03/12/15 17:55	1
Naphthalene	ND		2.0		ug/L			03/12/15 17:55	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
o-Xylene	ND		1.0		ug/L			03/12/15 17:55	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 17:55	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
Styrene	ND		1.0		ug/L			03/12/15 17:55	1
tert-Butanol	ND		5.0		ug/L			03/12/15 17:55	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 17:55	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 17:55	1
Toluene	ND		1.0		ug/L			03/12/15 17:55	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 17:55	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 17:55	1
Trichloroethene	ND		1.0		ug/L			03/12/15 17:55	1

Client Sample ID: Trip Blank
Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 17:55	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 17:55	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 140*		*03/12/15 17:55*	*1*
4-Bromofluorobenzene (Surr)	*105*		*68.7 - 141*		*03/12/15 17:55*	*1*
Dibromofluoromethane (Surr)	*97*		*71.2 - 143*		*03/12/15 17:55*	*1*
Toluene-d8 (Surr)	*102*		*74.1 - 135*		*03/12/15 17:55*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			03/20/15 11:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*68.7 - 141*		*03/20/15 11:24*	*1*

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-727/5
Matrix: Water
Analysis Batch: 727

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1,1-Trichloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1,2,2-Tetrachloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1,2-Trichloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1,2-Trichlorotrifluoroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1-Dichloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,1-Dichloroethene	ND		1.0		ug/L			03/12/15 12:18	1
1,1-Dichloropropene	ND		1.0		ug/L			03/12/15 12:18	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,2,3-Trichloropropane	ND		1.0		ug/L			03/12/15 12:18	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,2,4-Trimethylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,2-Dibromo-3-Chloropropane	ND		5.0		ug/L			03/12/15 12:18	1
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/12/15 12:18	1
1,2-Dichlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,2-Dichloroethane	ND		1.0		ug/L			03/12/15 12:18	1
1,2-Dichloropropane	ND		1.0		ug/L			03/12/15 12:18	1
1,3,5-Trimethylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,3-Dichlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
1,3-Dichloropropane	ND		1.0		ug/L			03/12/15 12:18	1
1,4-Dichlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
2,2-Dichloropropane	ND		1.0		ug/L			03/12/15 12:18	1
2-Butanone (MEK)	ND		10		ug/L			03/12/15 12:18	1
2-Chlorotoluene	ND		1.0		ug/L			03/12/15 12:18	1
2-Hexanone	ND		10		ug/L			03/12/15 12:18	1
4-Chlorotoluene	ND		1.0		ug/L			03/12/15 12:18	1
4-Methyl-2-pentanone (MIBK)	ND		10		ug/L			03/12/15 12:18	1
Acetone	ND		25		ug/L			03/12/15 12:18	1
Benzene	ND		0.20		ug/L			03/12/15 12:18	1
Bromobenzene	ND		1.0		ug/L			03/12/15 12:18	1
Bromochloromethane	ND		1.0		ug/L			03/12/15 12:18	1
Bromodichloromethane	ND		1.0		ug/L			03/12/15 12:18	1
Bromoform	ND		1.0		ug/L			03/12/15 12:18	1
Bromomethane	ND		5.0		ug/L			03/12/15 12:18	1
Carbon disulfide	ND		1.0		ug/L			03/12/15 12:18	1
Carbon tetrachloride	ND		1.0		ug/L			03/12/15 12:18	1
Chlorobenzene	ND		1.0		ug/L			03/12/15 12:18	1
Chloroethane	ND		1.0		ug/L			03/12/15 12:18	1
Chloroform	ND		1.0		ug/L			03/12/15 12:18	1
Chloromethane	ND		3.0		ug/L			03/12/15 12:18	1
cis-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 12:18	1
cis-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 12:18	1
Dibromochloromethane	ND		1.0		ug/L			03/12/15 12:18	1
Dibromomethane	ND		1.0		ug/L			03/12/15 12:18	1
Dichlorodifluoromethane	ND		1.0		ug/L			03/12/15 12:18	1
Dichlorofluoromethane	ND		0.20		ug/L			03/12/15 12:18	1
Ethylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
Hexachlorobutadiene	ND		2.0		ug/L			03/12/15 12:18	1

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

Lab Sample ID: MB 590-727/5
Matrix: Water
Analysis Batch: 727

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexane	ND		1.0		ug/L			03/12/15 12:18	1
Isopropylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
m,p-Xylene	ND		2.0		ug/L			03/12/15 12:18	1
Methyl tert-butyl ether	ND		1.0		ug/L			03/12/15 12:18	1
Methylene Chloride	ND		10		ug/L			03/12/15 12:18	1
Naphthalene	ND		2.0		ug/L			03/12/15 12:18	1
n-Butylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
N-Propylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
o-Xylene	ND		1.0		ug/L			03/12/15 12:18	1
p-Isopropyltoluene	ND		1.0		ug/L			03/12/15 12:18	1
sec-Butylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
Styrene	ND		1.0		ug/L			03/12/15 12:18	1
tert-Butanol	ND		5.0		ug/L			03/12/15 12:18	1
tert-Butylbenzene	ND		1.0		ug/L			03/12/15 12:18	1
Tetrachloroethene	ND		1.0		ug/L			03/12/15 12:18	1
Toluene	ND		1.0		ug/L			03/12/15 12:18	1
trans-1,2-Dichloroethene	ND		1.0		ug/L			03/12/15 12:18	1
trans-1,3-Dichloropropene	ND		1.0		ug/L			03/12/15 12:18	1
Trichloroethene	ND		1.0		ug/L			03/12/15 12:18	1
Trichlorofluoromethane	ND		1.0		ug/L			03/12/15 12:18	1
Vinyl chloride	ND		0.20		ug/L			03/12/15 12:18	1
Xylenes, Total	ND		3.0		ug/L			03/12/15 12:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 140*		*03/12/15 12:18*	*1*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*03/12/15 12:18*	*1*
Dibromofluoromethane (Surr)	*98*		*71.2 - 143*		*03/12/15 12:18*	*1*
Toluene-d8 (Surr)	*105*		*74.1 - 135*		*03/12/15 12:18*	*1*

Lab Sample ID: LCS 590-727/6
Matrix: Water
Analysis Batch: 727

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	10.0	8.76		ug/L		88	60 - 140
1,1,1-Trichloroethane	10.0	8.30		ug/L		83	60 - 140
1,1,2,2-Tetrachloroethane	10.0	9.91		ug/L		99	60 - 140
1,1,2-Trichloroethane	10.0	9.54		ug/L		95	60 - 140
1,1,2-Trichlorotrifluoroethane	10.0	8.06		ug/L		81	60 - 140
1,1-Dichloroethane	10.0	8.70		ug/L		87	60 - 140
1,1-Dichloroethene	10.0	8.21		ug/L		82	78.1 - 155
1,1-Dichloropropene	10.0	8.52		ug/L		85	60 - 140
1,2,3-Trichlorobenzene	10.0	9.68		ug/L		97	60 - 140
1,2,3-Trichloropropane	10.0	8.39		ug/L		84	60 - 140
1,2,4-Trichlorobenzene	10.0	9.28		ug/L		93	60 - 140
1,2,4-Trimethylbenzene	10.0	8.94		ug/L		89	60 - 140
1,2-Dibromo-3-Chloropropane	10.0	10.1		ug/L		101	60 - 140
1,2-Dichlorobenzene	10.0	9.05		ug/L		91	60 - 140

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

Lab Sample ID: LCS 590-727/6
Matrix: Water
Analysis Batch: 727

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichloroethane	10.0	8.97		ug/L		90	63.9 - 144
1,2-Dichloropropane	10.0	9.31		ug/L		93	60 - 140
1,3,5-Trimethylbenzene	10.0	8.85		ug/L		89	60 - 140
1,3-Dichlorobenzene	10.0	9.04		ug/L		90	60 - 140
1,3-Dichloropropane	10.0	9.23		ug/L		92	60 - 140
1,4-Dichlorobenzene	10.0	9.08		ug/L		91	60 - 140
2,2-Dichloropropane	10.0	8.75		ug/L		88	60 - 140
2-Butanone (MEK)	50.0	55.7		ug/L		111	60 - 140
2-Chlorotoluene	10.0	8.75		ug/L		88	60 - 140
2-Hexanone	50.0	52.3		ug/L		105	60 - 140
4-Chlorotoluene	10.0	8.72		ug/L		87	60 - 140
4-Methyl-2-pentanone (MIBK)	50.0	48.4		ug/L		97	60 - 140
Acetone	50.0	72.2	*	ug/L		144	60 - 140
Benzene	10.0	8.93		ug/L		89	80 - 140
Bromobenzene	10.0	8.94		ug/L		89	60 - 140
Bromochloromethane	10.0	8.67		ug/L		87	60 - 140
Bromodichloromethane	10.0	8.73		ug/L		87	60 - 140
Bromoform	10.0	8.41		ug/L		84	60 - 140
Bromomethane	10.0	7.93		ug/L		79	60 - 140
Carbon disulfide	10.0	7.65		ug/L		76	60 - 140
Carbon tetrachloride	10.0	8.09		ug/L		81	60 - 140
Chlorobenzene	10.0	8.86		ug/L		89	79.2 - 125
Chloroethane	10.0	8.25		ug/L		83	60 - 140
Chloroform	10.0	8.61		ug/L		86	60 - 140
Chloromethane	10.0	7.68		ug/L		77	60 - 140
cis-1,2-Dichloroethene	10.0	8.83		ug/L		88	60 - 140
cis-1,3-Dichloropropene	10.0	8.87		ug/L		89	60 - 140
Dibromochloromethane	10.0	8.84		ug/L		88	60 - 140
Dibromomethane	10.0	8.81		ug/L		88	60 - 140
Dichlorodifluoromethane	10.0	7.56		ug/L		76	60 - 140
Dichlorofluoromethane	10.0	8.64		ug/L		86	60 - 140
Ethylbenzene	10.0	8.45		ug/L		85	80 - 120
Hexachlorobutadiene	10.0	8.95		ug/L		90	80 - 120
Hexane	10.0	8.74		ug/L		87	60 - 140
Isopropylbenzene	10.0	8.54		ug/L		85	60 - 140
m,p-Xylene	10.0	8.41		ug/L		84	80 - 120
Methyl tert-butyl ether	10.0	9.15		ug/L		92	80.1 - 128
Methylene Chloride	10.0	10.1		ug/L		101	60 - 140
Naphthalene	10.0	9.22		ug/L		92	62.8 - 132
n-Butylbenzene	10.0	8.58		ug/L		86	60 - 140
N-Propylbenzene	10.0	8.74		ug/L		87	60 - 140
o-Xylene	10.0	8.43		ug/L		84	80 - 120
p-Isopropyltoluene	10.0	9.14		ug/L		91	60 - 140
sec-Butylbenzene	10.0	8.78		ug/L		88	60 - 140
Styrene	10.0	8.21		ug/L		82	60 - 140
tert-Butanol	100	102		ug/L		102	60 - 140
tert-Butylbenzene	10.0	9.20		ug/L		92	60 - 140
Tetrachloroethene	10.0	8.69		ug/L		87	60 - 140

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

Lab Sample ID: LCS 590-727/6
Matrix: Water
Analysis Batch: 727

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Toluene	10.0	8.67		ug/L		87	80 - 123
trans-1,2-Dichloroethene	10.0	8.53		ug/L		85	60 - 140
trans-1,3-Dichloropropene	10.0	9.22		ug/L		92	60 - 140
Trichloroethene	10.0	8.23		ug/L		82	74.8 - 123
Trichlorofluoromethane	10.0	7.58		ug/L		76	60 - 140
Vinyl chloride	10.0	7.73		ug/L		77	60 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 140*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*
Dibromofluoromethane (Surr)	*96*		*71.2 - 143*
Toluene-d8 (Surr)	*103*		*74.1 - 135*

Lab Sample ID: MB 590-730/5
Matrix: Water
Analysis Batch: 730

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	ND		10		ug/L			03/13/15 10:12	1

Lab Sample ID: LCS 590-730/6
Matrix: Water
Analysis Batch: 730

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Butanone (MEK)	50.0	52.7		ug/L		105	60 - 140

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Lab Sample ID: MB 590-757/4
Matrix: Water
Analysis Batch: 757

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			03/17/15 07:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*68.7 - 141*		*03/17/15 07:58*	*1*

Lab Sample ID: LCS 590-757/5
Matrix: Water
Analysis Batch: 757

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	1020		ug/L		102	80 - 120

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS) (Continued)

Lab Sample ID: LCS 590-757/5
Matrix: Water
Analysis Batch: 757

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

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*68.7 - 141*

Lab Sample ID: LCSD 590-757/6
Matrix: Water
Analysis Batch: 757

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	1010		ug/L		101	80 - 120	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*95*		*68.7 - 141*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 590-749/1-A
Matrix: Water
Analysis Batch: 744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 749

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.158		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
2-Methylnaphthalene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
1-Methylnaphthalene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Acenaphthylene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Acenaphthene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Fluorene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Phenanthrene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Anthracene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Fluoranthene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Pyrene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Benzo[a]anthracene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Chrysene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Benzo[b]fluoranthene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Benzo[k]fluoranthene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Benzo[a]pyrene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Indeno[1,2,3-cd]pyrene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Dibenz(a,h)anthracene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1
Benzo[g,h,i]perylene	ND		0.090		ug/L		03/16/15 10:37	03/16/15 13:38	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*100*		*32.7 - 135*	*03/16/15 10:37*	*03/16/15 13:38*	*1*
2-Fluorobiphenyl (Surr)	*83*		*44.3 - 120*	*03/16/15 10:37*	*03/16/15 13:38*	*1*
p-Terphenyl-d14	*97*		*59.5 - 154*	*03/16/15 10:37*	*03/16/15 13:38*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 590-749/2-A
Matrix: Water
Analysis Batch: 744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 749

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	1.60	1.81		ug/L		113	27.8 - 143
Fluorene	1.60	1.91		ug/L		119	59.2 - 120
Chrysene	1.60	1.84		ug/L		115	69.1 - 122
Indeno[1,2,3-cd]pyrene	1.60	1.98		ug/L		124	56.1 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*104*		*32.7 - 135*
2-Fluorobiphenyl (Surr)	*88*		*44.3 - 120*
p-Terphenyl-d14	*96*		*59.5 - 154*

Lab Sample ID: MB 590-900/1-A
Matrix: Water
Analysis Batch: 899

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 900

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
2-Methylnaphthalene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
1-Methylnaphthalene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Acenaphthylene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Acenaphthene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Fluorene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Phenanthrene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Anthracene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Fluoranthene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Pyrene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Benzo[a]anthracene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Chrysene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Benzo[b]fluoranthene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Benzo[k]fluoranthene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Benzo[a]pyrene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Indeno[1,2,3-cd]pyrene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Dibenz(a,h)anthracene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1
Benzo[g,h,i]perylene	ND		0.090		ug/L		03/27/15 15:49	03/27/15 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*115*		*32.7 - 135*	*03/27/15 15:49*	*03/27/15 16:51*	*1*
2-Fluorobiphenyl (Surr)	*89*		*44.3 - 120*	*03/27/15 15:49*	*03/27/15 16:51*	*1*
p-Terphenyl-d14	*105*		*59.5 - 154*	*03/27/15 15:49*	*03/27/15 16:51*	*1*

Lab Sample ID: LCS 590-900/2-A
Matrix: Water
Analysis Batch: 899

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 900

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	1.60	1.69		ug/L		106	27.8 - 143
Fluorene	1.60	2.00	*	ug/L		125	59.2 - 120
Chrysene	1.60	1.97	*	ug/L		123	69.1 - 122

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 590-900/2-A
Matrix: Water
Analysis Batch: 899

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 900

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Indeno[1,2,3-cd]pyrene	1.60	2.09		ug/L		130	56.1 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*106*		*32.7 - 135*
2-Fluorobiphenyl (Surr)	*94*		*44.3 - 120*
p-Terphenyl-d14	*102*		*59.5 - 154*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Lab Sample ID: MB 590-812/1-A
Matrix: Water
Analysis Batch: 813

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 812

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.010		ug/L		03/20/15 13:52	03/20/15 17:29	1

Lab Sample ID: LCS 590-812/2-A
Matrix: Water
Analysis Batch: 813

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 812

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	0.125	0.145		ug/L		116	60 - 140

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-771/1-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 771

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 11:42	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		03/17/15 11:40	03/18/15 11:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*03/17/15 11:40*	*03/18/15 11:42*	*1*
n-Triacontane-d62	*90*		*50 - 150*	*03/17/15 11:40*	*03/18/15 11:42*	*1*

Lab Sample ID: LCS 590-771/2-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 771

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	3.20	2.65		mg/L		83	50 - 150
Residual Range Organics (RRO) (C25-C36)	3.20	2.82		mg/L		88	50 - 150

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 590-771/2-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 771

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	98		50 - 150
n-Triacontane-d62	103		50 - 150

Lab Sample ID: LCSD 590-771/3-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 771

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	3.20	2.77		mg/L		87	50 - 150	4	25
Residual Range Organics (RRO) (C25-C36)	3.20	2.75		mg/L		86	50 - 150	2	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	102		50 - 150
n-Triacontane-d62	99		50 - 150

Lab Sample ID: MB 590-772/1-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Method Blank
Prep Type: Silica Gel Cleanup
Prep Batch: 772

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		03/17/15 11:40	03/18/15 18:45	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		03/17/15 11:40	03/18/15 18:45	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	93		50 - 150	03/17/15 11:40	03/18/15 18:45	1
n-Triacontane-d62	97		50 - 150	03/17/15 11:40	03/18/15 18:45	1

Lab Sample ID: LCS 590-772/2-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Lab Control Sample
Prep Type: Silica Gel Cleanup
Prep Batch: 772

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	3.20	2.46		mg/L		77	50 - 150
Residual Range Organics (RRO) (C25-C36)	3.20	2.82		mg/L		88	50 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	95		50 - 150
n-Triacontane-d62	102		50 - 150

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 590-772/3-A
Matrix: Water
Analysis Batch: 774

Client Sample ID: Lab Control Sample Dup
Prep Type: Silica Gel Cleanup
Prep Batch: 772

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	3.20	2.54		mg/L		80	50 - 150	3	25
Residual Range Organics (RRO) (C25-C36)	3.20	2.75		mg/L		86	50 - 150	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*95*		*50 - 150*
n-Triacontane-d62	*97*		*50 - 150*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-711/15
Matrix: Water
Analysis Batch: 711

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			03/11/15 14:16	1

Lab Sample ID: LCS 590-711/14
Matrix: Water
Analysis Batch: 711

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.99		mg/L		100	90 - 110

Lab Sample ID: MB 590-712/15
Matrix: Water
Analysis Batch: 712

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50		mg/L			03/11/15 14:16	1

Lab Sample ID: LCS 590-712/14
Matrix: Water
Analysis Batch: 712

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	12.5	12.8		mg/L		103	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 590-799/2-A
Matrix: Water
Analysis Batch: 815

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 799

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.014		mg/L		03/19/15 14:47	03/20/15 09:45	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-799/1-A
Matrix: Water
Analysis Batch: 815

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 799

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	1.00	0.957		mg/L		96	85 - 115

Method: SM 5310C - TOC

Lab Sample ID: MB 490-233985/1
Matrix: Water
Analysis Batch: 233985

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0		mg/L			03/16/15 09:42	1

Lab Sample ID: LCS 490-233985/4
Matrix: Water
Analysis Batch: 233985

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.62		mg/L		96	90 - 110
TOC Result 1	10.0	9.61		mg/L		96	90 - 110
TOC Result 2	10.0	9.64		mg/L		96	90 - 110

Lab Sample ID: LCSD 490-233985/5
Matrix: Water
Analysis Batch: 233985

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	10.0	9.55		mg/L		95	90 - 110	1	20
TOC Result 1	10.0	9.63		mg/L		96	90 - 110	0	20
TOC Result 2	10.0	9.47		mg/L		95	90 - 110	2	20

Lab Sample ID: 590-413-1 MS
Matrix: Water
Analysis Batch: 233985

Client Sample ID: MW-1-031015
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	1.0		20.0	20.9		mg/L		99	75 - 122
TOC Result 1	1.0		20.0	21.1		mg/L		100	75 - 122
TOC Result 2	1.0		20.0	20.7		mg/L		98	75 - 122

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-1-031015
Lab Sample ID: 590-398-1
Date Collected: 03/10/15 12:05
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 12:52	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 12:52	MRS	TAL SPK

Client Sample ID: MW-2-031015
Lab Sample ID: 590-398-2
Date Collected: 03/10/15 08:54
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 13:06	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 13:06	MRS	TAL SPK

Client Sample ID: MW-3-031015
Lab Sample ID: 590-398-3
Date Collected: 03/10/15 09:48
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 13:20	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 13:20	MRS	TAL SPK

Client Sample ID: MW-4-031015
Lab Sample ID: 590-398-4
Date Collected: 03/10/15 10:23
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 13:34	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 13:34	MRS	TAL SPK

Client Sample ID: MW-5-031015
Lab Sample ID: 590-398-5
Date Collected: 03/10/15 11:15
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 13:48	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 13:48	MRS	TAL SPK

Client Sample ID: MW-DUP-031015
Lab Sample ID: 590-398-6
Date Collected: 03/10/15 12:00
Matrix: Water
Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		711	03/11/15 14:31	MRS	TAL SPK

Client Sample ID: MW-DUP-031015

Lab Sample ID: 590-398-6

Date Collected: 03/10/15 12:00

Matrix: Water

Date Received: 03/11/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		712	03/11/15 14:31	MRS	TAL SPK

Client Sample ID: MW-1-031015

Lab Sample ID: 590-413-1

Date Collected: 03/10/15 12:05

Matrix: Water

Date Received: 03/12/15 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 15:39	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 10:46	MRS	TAL SPK
Total/NA	Prep	3510C			268.8 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	268.8 mL	2 mL	768	03/17/15 12:26	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 18:20	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			129.9 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	129.9 mL	2 mL	774	03/18/15 19:55	NMI	TAL SPK
Total/NA	Prep	3510C			129.9 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	129.9 mL	2 mL	774	03/18/15 16:01	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:32	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: MW-2-031015

Lab Sample ID: 590-413-2

Date Collected: 03/10/15 08:54

Matrix: Water

Date Received: 03/12/15 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 16:02	MRS	TAL SPK
Total/NA	Analysis	8260C		1	5 mL	5 mL	730	03/13/15 12:42	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 11:08	MRS	TAL SPK
Total/NA	Prep	3510C			266.1 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	266.1 mL	2 mL	768	03/17/15 12:53	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 18:36	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			128.6 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	128.6 mL	2 mL	774	03/18/15 20:19	NMI	TAL SPK
Total/NA	Prep	3510C			128.6 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	128.6 mL	2 mL	774	03/18/15 16:24	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:34	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: MW-3-031015

Lab Sample ID: 590-413-3

Date Collected: 03/10/15 09:48

Matrix: Water

Date Received: 03/12/15 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 16:24	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 11:31	MRS	TAL SPK
Total/NA	Prep	3510C			264.5 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	264.5 mL	2 mL	768	03/17/15 13:21	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 18:53	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			127.4 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	127.4 mL	2 mL	774	03/18/15 20:42	NMI	TAL SPK
Total/NA	Prep	3510C			127.4 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	127.4 mL	2 mL	774	03/18/15 16:48	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:37	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: MW-4-031015

Lab Sample ID: 590-413-4

Date Collected: 03/10/15 10:23

Matrix: Water

Date Received: 03/12/15 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 16:47	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 11:53	MRS	TAL SPK
Total/NA	Prep	3510C			264.5 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	264.5 mL	2 mL	768	03/17/15 13:48	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 19:10	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			127.4 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	127.4 mL	2 mL	774	03/18/15 21:06	NMI	TAL SPK
Total/NA	Prep	3510C			127.4 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	127.4 mL	2 mL	774	03/18/15 17:11	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:40	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: MW-5-031015

Lab Sample ID: 590-413-5

Date Collected: 03/10/15 11:15

Matrix: Water

Date Received: 03/12/15 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 17:10	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 12:15	MRS	TAL SPK
Total/NA	Prep	3510C			268.3 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	268.3 mL	2 mL	768	03/17/15 14:16	NMI	TAL SPK

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Client Sample ID: MW-5-031015

Date Collected: 03/10/15 11:15
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			269.6 mL	2 mL	900	03/27/15 15:49	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	269.6 mL	2 mL	899	03/27/15 17:47	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 19:27	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			130.4 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	130.4 mL	2 mL	774	03/18/15 21:29	NMI	TAL SPK
Total/NA	Prep	3510C			130.4 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	130.4 mL	2 mL	774	03/18/15 17:34	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:42	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: MW-Dup-031015

Date Collected: 03/10/15 12:00
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 17:32	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	757	03/17/15 12:38	MRS	TAL SPK
Total/NA	Prep	3510C			270 mL	2 mL	749	03/16/15 10:37	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	270 mL	2 mL	768	03/17/15 14:44	NMI	TAL SPK
Total/NA	Prep	3510C			264 mL	2 mL	900	03/27/15 15:49	NMI	TAL SPK
Total/NA	Analysis	8270D SIM		1	264 mL	2 mL	899	03/27/15 18:15	NMI	TAL SPK
Total/NA	Prep	8011			80 mL	2 mL	812	03/20/15 13:52	NMI	TAL SPK
Total/NA	Analysis	8011		1	80 mL	2 mL	813	03/20/15 19:44	NMI	TAL SPK
Silica Gel Cleanup	Prep	3510C SGC			128.8 mL	2 mL	772	03/17/15 11:40	NMI	TAL SPK
Silica Gel Cleanup	Analysis	NWTPH-Dx		1	128.8 mL	2 mL	774	03/18/15 21:53	NMI	TAL SPK
Total/NA	Prep	3510C			128.8 mL	2 mL	771	03/17/15 11:40	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	128.8 mL	2 mL	774	03/18/15 17:58	NMI	TAL SPK
Total/NA	Prep	200.7			50 mL	50 mL	799	03/19/15 14:47	JSP	TAL SPK
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	815	03/20/15 10:45	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	233985	03/16/15 09:42	JAB	TAL NSH

Client Sample ID: Trip Blank

Date Collected: 03/10/15 08:54
Date Received: 03/12/15 09:05

Lab Sample ID: 590-413-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	727	03/12/15 17:55	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	808	03/20/15 11:24	MRS	TAL SPK

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Laboratory: TestAmerica Spokane

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-071	10-31-15
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C789	07-19-15

Method Summary

Client: GeoEngineers Inc
Project/Site: Tiger Oil NIST

TestAmerica Job ID: 590-398-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SPK
8011	EDB, DBCP, and 1,2,3-TCP (GC)	SW846	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
300.0	Anions, Ion Chromatography	MCAWW	TAL SPK
200.7 Rev 4.4	Metals (ICP)	EPA	TAL SPK
SM 5310C	TOC	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NWTPH = Northwest Total Petroleum Hydrocarbon

SM = "Standard Methods For The Examination Of Water And Wastewater",

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11922 E. First Ave., Spokane WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: GeoEngineers

INVOICE TO:

REPORT TO: JR Sugalski: JSugalski@geoengineers.com
ADDRESS: 523 East Second Ave
Spokane, WA 99202
PHONE: 509-363-3125 FAX: 509-363-3126

P.O. NUMBER:

PROJECT NAME: Tiger Oil N 1st
PROJECT NUMBER: 0504-101-00
SAMPLED BY: JWR

TURNAROUND REQUEST
in Business Days *
Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE: Nitric	PRESERVATIVE: Sulfuric	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	MW-1-031015	3/10/15 ~~0955~~ 1205	X	X	W	1		
2	MW-2-031015	0854						
3	MW-3-031015	0948						
4	MW-4-031015	1023						
5	MW-5-031015	1115						
6	MW-DUP-031015	1200						
7								
8								
9								
10								

REQUESTED ANALYSES

RELEASED BY: [signature] DATE: 3/10/15
PRINT NAME: Justin Rice FIRM: Geo TIME: 1330

RECEIVED BY: Sheila Kratz DATE: 3/11/15
PRINT NAME: Sheila Kratz FIRM: TestAmerica TIME: 9:50

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE
PRINT NAME: FIRM: TIME

ADDITIONAL REMARKS:

TEMP: C 1.4 PAGE 1 OF 1

590-398 Chain of Custody

TAL-1000 (0714)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11922 E. First Ave., Spokane WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: GeoEngineers

REPORT TO: JR Sugalski jsugalski@geoengineers.com
ADDRESS: 523 East Second Ave
Spokane WA 99202
PHONE: 509-363-3125 FAX: 509-363-3126

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Tiger Oil - Wist
PROJECT NUMBER: 0504-101-00
SAMPLED BY: JWR

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	NWTPH-Gx	NWTPH-Dx	VOCs	Naphthalene 8011	EDB 8011	TOC	lead	8270 PAHs	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	MW-1-031015	3/10/15 1205		X	X	X	X	X	X	X	X	W	10		
2	MW-2-031015	0854													
3	MW-3-031015	0948													
4	MW-4-031015	1023													
5	MW-5-031015	1115													
6	MW-Dup-031015	1200													
7															
8															
9															
10															

590-413 Chain of Custody

RELEASED BY: Justin Tice		DATE: 3/12/15	RECEIVED BY: Sheila Kratz		DATE: 3/12/15
PRINT NAME: JR	FIRM: Geo	TIME: 0905	PRINT NAME: Sheila Kratz	FIRM: Test America	TIME: 9:05
RELEASED BY:		DATE:	RECEIVED BY:		DATE:
PRINT NAME:	FIRM:	TIME:	PRINT NAME:	FIRM:	TIME:

ADDITIONAL REMARKS:
NWTPH-Dx both with & with-out Silica gel clean-up; VOCs and Naphthalene EPA 8260C
EDB with EPA 8011, TOC with SM5310B

TEMP: 5.5 C

PAGE OF

TAL-1000 (0714)

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-398-1

Login Number: 398

List Source: TestAmerica Spokane

List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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.	True	
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.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-398-1

Login Number: 413

List Source: TestAmerica Spokane

List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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.	True	
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.	False	Sample Trip Blank received but not listed on COC.
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.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-398-1

Login Number: 413
List Number: 2
Creator: Huckaba, Jimmy

List Source: TestAmerica Nashville
List Creation: 03/13/15 05:34 PM

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

APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This Appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of the Washington State Department of Ecology (Ecology). This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Ecology should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the Tiger Oil North 1st site located at 1808 North 1st Street in Yakima, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of Ecology. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm and Ecology with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with Ecology and generally accepted environmental practices in this area at the time this report was prepared.

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[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

Environmental Regulations are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain Even After This Phase II ESA is Completed

No ESA can wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely-spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Soil and Groundwater End Use

The cleanup levels referenced in this report are site- and situation-specific. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject site to another location or its reuse on site in instances that we were not aware of or could not control.

Most Environmental Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Do Not Redraw the Exploration Logs

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproductions are acceptable, but recognize that separating logs from the report can elevate risk.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Geoenvironmental Reports Should Not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Ecology desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Have we delivered World Class Client Service?

Please let us know by visiting **www.geoengineers.com/feedback**.

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