Baseline Assessment Report

Future Knight Oil & Gas Well Site
690 State Highway 66
Longmont, Colorado

January 8, 2019
Terracon Project No. 22187033

Prepared for:
City of Longmont
Longmont, Colorado

Prepared by:
Terracon Consultants, Inc.
Longmont, Colorado

January 8, 2019

City of Longmont
385 Kimbark Street
Longmont, Colorado 80501

Attn: Mr. Jason Elkins
P: (303) 651-8310
E: Jason.Elkins@longmontcolorado.gov

Re: Baseline Assessment Report
Future Knight Oil & Gas Well Site
690 State Highway 66
Longmont, Colorado
Terracon Project No. 22187033

Dear Mr. Elkins:

Terracon Consultants, Inc. (Terracon) is pleased to submit our report of Limited Soil, Groundwater, and Soil Gas Investigation activities completed at the site referenced above. The report presents data from recent field activities that included the completion of soil borings, groundwater monitoring wells, and soil vapor points; and the collection of soil, groundwater, and soil gas samples for chemical analysis. Terracon conducted the Investigation in general accordance with our proposal (P22187033), dated August 31, 2018.

Terracon appreciates this opportunity to provide environmental consulting services to The City of Longmont. Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Terracon Consultants, Inc.

Charles A. Covington
Staff Geologist

John C. Graves, P.G.
Regional Manager/Senior Principal

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FUTURE KNIGHT OIL & GAS WELL SITE
690 STATE HIGHWAY 66
LONGMONT, COLORADO

Terracon Project No. 22187033
January 8, 2019

1.0 SITE DESCRIPTION

Site Name	Future Knight Oil & Gas Well Site
Site Location	690 State Highway 66, Longmont, Colorado
Site Description	The site is located between State Highway 66 to the north and Weld County Road 28 to the south. The future Knight Well Site is to be located on a piece of undeveloped grazing land on the southern portion of a ranch residence. The site gently slopes towards the south. Adjacent properties include additional agricultural land to the north, south and east, with residential development to the west of the site.

A Topographic Map showing the site location is included as Exhibit 1 and a Site Diagram is included as Exhibit 2 in Appendix A.

2.0 SCOPE OF SERVICES

In 2012, Terracon was retained by the City of Longmont (COL) to assess seventeen plugged and abandoned oil and gas wells located within the City of Longmont limits. The objective of the 2012 assessment was to provide information concerning the plugging and abandoning of 17 oil and gas (O&G) wellheads located within the City of Longmont and to assess the potential presence of surficial soil impacts, methane and other gases in the subsurface near the surveyed well locations.

Since then, the City of Longmont has continued to assess sensitive environmental receptors, including soil, water, and soil gas conditions related to current and future oil and gas exploration and production in and around city limits. Terracon understands that the City of Longmont would like to expand the scope of work to include assessing the condition of soil, groundwater, and soil gas at select locations including collection of background conditions prior to future O&G activities.

The objective of the environmental services was to provide information concerning the future Knight O&G well pad, prior to its construction, located east of the City of Longmont. The sampling data will be used to establish a baseline data set for the ability to assess the potential presence of surficial/subsurface soil, groundwater, or soil gas impacts and presence of methane and other gasses in the subsurface near the planned well pad location.

2.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These Investigation services were performed in accordance with the scope of work agreed with you, our client, as reflected in our proposal and were not restricted by ASTM E1903-11.

2.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this Investigation. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

2.3 Reliance

This report has been prepared for the exclusive use of the City of Longmont, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of the City of Longmont and Terracon. Any unauthorized distribution or reuse is at the City of Longmont's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, Investigation report, and Terracon's Master Services Agreement (MSA) with the City of Longmont. The limitation of liability defined in the terms and conditions of the MSA is the aggregate limit of Terracon's liability to the City of Longmont and all relying parties unless otherwise agreed in writing.

3.0 FIELD INVESTIGATION

3.1 Safety and Subsurface Utilities

Terracon is committed to the safety of all its employees. As such, and in accordance with our Incident and Injury Free® safety goals, Terracon conducted the fieldwork under a safety plan developed for this project. Work was performed using United States Environmental Protection Agency (USEPA) Level D work attire consisting of hard hats, safety glasses, protective gloves, and protective boots. Terracon contacted Colorado 811 and requested location and markings for all utilities that the service was responsible for before commencing intrusive activities at the site.

3.2 Soil Boring Advancement

Two soil borings (SB-01 and SB-02) and one soil vapor point (SVP-01) were installed within the proposed footprint of the future well pad location using direct push drilling technology on October 5, 2018. Drilling refusal occurred in SB-01 at a depth of 19 feet below ground surface (bgs) and 19.5 feet bgs in SB-02. Ground water was not observed during drilling.

Terracon returned to the site on October 29, 2018 to complete soil borings SB-01 and SB-02 to the target depth and complete an additional soil boring (SB-03) outside the proposed well pad footprint, to be completed as a permanent monitoring wells using hollow stem auger (HSA) drilling methods. Soil borings SB-01 and SB-02 were advanced to a depth of approximately 40 feet bgs and converted to temporary monitoring wells to facilitate the collection of grab groundwater samples. Soil boring SB-03 was drilled to a depth of approximately 40 feet bgs. Refer to the attached Site Diagram (Exhibit 2, Appendix A) for a depiction of the sample locations and pertinent site features.

Oversight of the drilling activities was conducted by a Terracon field professional. Soil samples were collected using 4-foot direct-push sampling tubes lined with dedicated PVC liners. Drilling equipment was cleaned using a high-pressure washer prior to beginning the project. Non-dedicated sampling equipment was cleaned using an Alconox® wash and potable water rinse prior to the beginning of the project and before collecting each soil sample.

Terracon field screened soil samples for organic vapors using a photoionization detector (PID). This device provides a direct reading in parts per million (ppm) isobutylene equivalents. Upon removal of the sampler from the borehole, Terracon put a portion of each sample in a sealable plastic bag. After a stabilization period, Terracon screened the headspace above the soil using the PID equipped with a 10.2 electron-volt (eV) ultraviolet lamp source. Terracon calibrated the PID in accordance with the manufacturer's recommendations before the field activities. The boring logs include the field screening results for each soil boring. Based on the field screening results, Terracon selected soil samples from each boring for laboratory analysis.

Terracon's soil sampling program involved assigning one soil sample from each soil boring for laboratory analysis. The soil sample selected for laboratory analysis was collected from the interval exhibiting the highest PID reading and/or highest likelihood of a release based on the field professional's judgment. The soil samples were collected using Terracon standard operating procedures (SOPs) and field methods. Soil sample intervals for each boring are presented on the soil boring logs included in Appendix C.

3.3 Groundwater Monitoring Well Installation

Soil borings SB-01 and SB-02 were completed as temporary groundwater monitoring wells MW-01 and MW-02. Terracon inserted sections of disposable polyvinyl chloride (PVC) well riser and screen into the boreholes to facilitate the collection of groundwater samples. Terracon collected groundwater samples using precleaned, single-use, disposable PVC/polyethylene bailers. After groundwater sample collection, Terracon abandoned SB-01 and SB-02 using soil cuttings and hydrated bentonite in accordance with state regulations.

Soil boring SB-03 was completed as permeant monitoring well MW-03. MW-03 was constructed to approximately 40 feet bgs using 2.0-inch diameter PVC with 10 feet of factory slotted well screen from well bottom and 30 feet of blank PVC casing to surface. A silica sand filter pack was placed around the well screen to approximately two feet above the top of well screen, followed by a hydrated bentonite seal, and approximately 0.5 feet of sand to the surface. The monitoring well was fitted with a J-plug well cap and a bolt-down, flush-mounted well cover set in concrete. The well construction details are provided on the soil boring logs presented in Appendix B.

On October 29, 2018 and November 11, 2018, Terracon personnel visited the site to collect static groundwater levels and collect groundwater samples for laboratory analysis. Depth to groundwater ranged from 1.5 feet below top of well casing (TOC) in MW-02, to 33.50 feet below TOC in MW-01. After being given time to naturally develop, depth to groundwater in MW-03 was measured at 8.36 feet below TOC.

Groundwater in monitoring well MW-03 was not manually developed at the time of installation. On October 29, groundwater from MW-03 was purged with a single-use PVC bailer and sampled after allowing the well to recharge for approximately 1-hour.

3.4 Soil Vapor Point Installation

Terracon installed one soil vapor point at the site. SVP-01 was installed on October 5, 2018 in the center of the proposed well pad footprint for collection of a soil gas sample for laboratory analysis. The soil gas point, consisting of 8.0-inch long stainless steel screened points and Teflon tubing, was placed into the a boring to an approximate depth of 5 feet bgs and backfilled with silica sand

to approximately 6 inches above the top of the screen, followed by hydrated bentonite to near surface. The location is depicted on Exhibit 2 in Appendix A.

Sampling of the soil gas point was performed by an Environmental Professional on October 5, 2018. Soil gas sampling was conducted within a polyethylene shroud placed over the sample point. Extracted soil gas was screened in the field utilizing a Multi-Rae multi-gas meter, which was calibrated prior to use in accordance with the manufacturer's specifications. The Multi-Rae was used to assess potential explosive gas (methane) and VOCs. Sample tubing was connected to the sampling point and routed to the exterior of the shroud. Leak detection was conducted by introducing helium tracer gas into the sampling shroud through a separate port prior to sampling and using a portable helium gas detector to monitor for potential leaks in the sampling train. A peristaltic pump was utilized to purge the sample train tubing prior to collecting the laboratory sample within the laboratory supplied 1-liter Summa® canister. Field measurements by the portable helium gas detector were within acceptable levels (less than [<]5 percent [%] of the helium concentration in the shroud was detected through the sampling train).

After purging the sampling point of approximately three sampling train volumes and observing that no leaks were detected, a laboratory-supplied 1-liter Summa® canister was filled with soil gas for laboratory analysis. The canister was connected to the sampling point using dedicated nylon sample tubing and was equipped with a laboratory-supplied flow regulator allowing for sample collection at a low-flow rate (i.e. <200 milliliters per minute [ml/min]).

3.5 Sampling Program

After packaging each soil and groundwater sample in laboratory-provided containers, Terracon recorded the sample time on each container label in permanent ink and place the filled containers in an ice-filled cooler for transport to Terracon's office. Upon completion of soil gas sample collection, the Summa® canister valve was closed, secured, and appropriately labeled with pertinent sample information. Canister pressures were recorded prior to and after sample collection. Sample containers/canister were placed into a shipping container and transported under chain-of-custody to PACE Analytical® (PACE) located in Mt. Juliet, Tennessee for analysis as outlined on the table below.

SAMPLING AND ANALYTICAL PROGRAM	
Soil Analysis	VOCs/TPH-GRO – EPA 8260 TPH-DRO/ORO – EPA 8015 PAHs – EPA 8270SIM Specific Conductance – EPA 9050A Sodium Adsorption Rate (SAR) – EPA 3050B pH – EPA 9045D Metals (arsenic, barium boron, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, silver, zinc) – EPA 200.8/6020
Groundwater Analysis	VOCs – EPA 8260 Dissolved Gases – RSK 175 Dissolved Gases CO_2 – EPA 4500CO2 D2011 Metals (arsenic, barium boron, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, silver, zinc) – EPA 200.8/6020 PAH's-8270 Total Dissolved Ions – EPA 160.1 Chloride and Sulfate – EPA 300.0
Soil Gas Analysis	VOCs – EPA TO-15 Methane – EPA D1946

EPA = Environmental Protection Agency; SW-846 analytical methods
VOCs = volatile organic compounds
TPH = total petroleum hydrocarbons
G/D/ORO = gasoline, diesel, and oil range organics
PAH = polycyclic aromatic hydrocarbons

4.0 RESULTS OF THE FIELD INVESTIGATION

4.1 Geology/Hydrogeology

The boring logs in Appendix B detail the observed soil stratigraphy. In general, Terracon encountered silty clay and sandy silt from approximately 0 to 10 feet bgs, underlain by weathered claystone and claystone, sandstone, and/or siltstone bedrock to soil boring termination. Groundwater was not observed during drilling activities. The depth to groundwater was later observed during well development activities and ranged from approximately 1.5 to 33.5 feet bgs. Groundwater is assumed to flow to the south, towards Union Reservoir.

4.2 Field Screening

The field screening results are summarized on the boring logs in Appendix B. PID readings above 1 part per million (ppm) were only observed in soil boring SB-01 at a maximum concentration of 9.7 ppm at an approximate depth of 4 to 8 feet bgs.

5.0 ANALYTICAL RESULTS

The laboratory analytical reports and chain-of-custody records are attached in Appendix C. The following sections describe the results of the analytical testing performed as part of this Background Assessment.

5.1 Soil Sample Results

The soil analytical data and corresponding action levels are summarized in Table 2 (Appendix B). The constituents of concern concentrations were compared to the May 2016, USEPA, Residential and Industrial RSLs and January 2015 COGCC Table 910-1 (Concentration Levels). A summary of concentrations in the soil samples is included in Table 1 (Appendix B).

Ethylbenzene, 1,2,4-Trimethylbenzene, and TPH-GRO constituents were reported at concentrations above laboratory detection limits in soil samples collected during this investigation. None of the detected concentrations exceeded regulatory action levels.

Metal constituents were reported above laboratory detection limits in the soil samples collected. With the exception of arsenic, reported metal concentrations were observed to be below their applicable action levels and within the expected concentrations for native soils. Arsenic was reported in soil sample collected from SB-01 (6.15 milligrams per kilogram [mg/kg]), SB-02 (5.44 mg/kg), and SB-03 (2.32 mg/kg). The Colorado Department of Public Health and Environment (CDPHE) recognizes that arsenic can be naturally occurring and has authored the document titled: *Risk Management Guidance for Evaluating Arsenic Concentrations in Soil*, published 2011, revised in 2014 (CDPHE, 2014). This document states that arsenic has been demonstrated to be naturally occurring in Colorado soils at concentrations significantly higher than the national average. The CDPHE developed an average background concentration of arsenic found in certain native Colorado soils averaging 11 mg/Kg with measured concentrations as low as 3 mg/Kg and as high as 19 mg/Kg. Arsenic concentrations at the site are within published background concentrations.

Physical properties of the soil including the sodium adsorption ratio (SAR), specific conductance, and pH were also measured by the laboratory. The physical (inorganic) properties measured for each soil sample are presented below:

Inorganics in Soils

Soil Boring	SAR	EC (µmhos/cm)	pH
SB-01 (8-12)	**21.3**	**5,540**	8.14
SB-02 (8-12)	**13.8**	3,200	7.95
SB-03 (15-19)	1.53	2,010	7.79
COGCC Concentration Levels	Less than 12	Less than 4,000	6-9

The SAR measured in soil borings SB-01 and SB-02, and specific conductance measured in soil boring SB-01 were reported to exceed the COGCC screening levels. The SAR levels indicate that sodium is displacing calcium and magnesium in the soil profile. The measured SAR and specific conductance levels indicate that the ability for the soil in this area to support plant growth is limited. Clay soils, such as those observed during drilling, also tend to have higher measured specific conductance results.

5.2 Groundwater Sample Results

Laboratory analytical results for the groundwater samples were compared to the June 30, 2016 CDPHE Groundwater Quality Standards (GWQSs) and January 2015 COGCC Table 910-1 Groundwater Concentration Levels (910-1 Levels). The groundwater analytical data and corresponding action levels are summarized in Table 2 (Appendix B).

VOC constituents were not reported at concentrations above laboratory detection limits in the groundwater samples collected from the monitoring wells during this investigation.

Naphthalene was reported in the groundwater samples collected from MW-02 and MW-03. The reported concentrations were below applicable regulatory standards.

Dissolved metals were detected in the groundwater samples above laboratory detection limits. Of the detected constituents, only dissolved arsenic and selenium exceeded regulatory standards. Dissolved arsenic was reported equal to the CDPHE GWQS in MW-01 (10 micrograms per liter [µg/L]). Dissolved selenium was reported at concentrations exceeding the CDPHE GWQS for selenium (50 µg/L) in the groundwater samples collected from MW-01 (2,290 µg/L), MW-02 (1,170 µg/L) and MW-03 (81.6 µg/L).

Free carbon dioxide was reported in the groundwater samples collected from MW-01 (60.9 mg/L) and MW-02 (78.9 mg/L). Although there is currently no regulatory limit established for dissolved carbon dioxide in groundwater, based on general accepted environmental practices, 10 to 1,000 mg/L of natural occurring dissolved carbon dioxide can be found in groundwater with close to neutral pH levels. Concentrations of carbon dioxide can vary greatly based on environmental and other factors such as pH, salinity, irrigation, and agricultural land uses.

Inorganic constituents analyzed for the groundwater samples included total dissolved solids (TDS), chlorides, and sulfates. The COGCC has defined the groundwater standard exceedance concentrations for chloride and sulfate to be a regional background concentration with a multiplier of 1.25. Terracon utilized 2018 analytical data for chloride and sulfate from the sites sampled during the City of Longmont 2018 Annual Groundwater Quality Monitoring sampling event (Terracon Project No. 22187009) to calculate respective regional background concentrations.

The COGCC cleanup goal was calculated by multiplying the mean (from background well data) by 1.25 per Table 910-1 from the COGCC rules. A summary of pertinent statistical results and the calculated COGCC cleanup levels for chloride and sulfate are listed below:

Statistical Analysis	Chloride (mg/L)	Sulfate (mg/L)
Mean (from background well data)	60.97	606.1
COGCC cleanup goal (1.25 x background)	76.21	757.63
Standard Deviation	22.52	243.3
Sample Size	26	14

Elevated concentrations of sulfates and chlorides above their respective laboratory analytical detection limits were reported in groundwater samples collected from monitoring wells at each location sampled during this monitoring event. The concentration of these inorganic constituents, including chlorides and sulfates, was determined to be below CDPHE and COGCC standards for groundwater. Refer to the groundwater analytical results in Table 2 included in this report for a detailed overview of regulatory exceedances.

For TDS, the maximum allowable concentration allowed by CDPHE is also dependent on the background level but can theoretically be any concentration. A TDS concentration of 400 milligrams per liter (mg/L) is generally used as a maximum allowable concentration until the background level is established. TDS concentrations reported during this investigation ranged from 7,270 to 58,500 mg/L.

5.3 Soil Gas Sample Results

CDPHE January 2016 Residential and Industrial Air Screening Concentrations (ASCs) and the June 2017 USEPA Residential and Industrial Indoor Air RSLs, after applying a 3% attenuation factor for subslab soil gas per the USEPA OSWER Technical Guide for Assessing and Mitigating the Gas Intrusion Pathway from Subsurface Gas Sources to Indoor Air (OSWER Guidance, June 2015) were used for soil gas comparison. Reference to the OSWER guidance is not meant to imply that the scope of this soil gas investigation was designed to include the guidance's subsurface characterization criteria or that Terracon conducted a detailed vapor intrusion risk assessment. A summary of the analytical results is provided below. The soil gas analytical data reported above laboratory detection limits and corresponding action levels are summarized in Table 3 (Appendix B).

Benzene (19.1 micrograms per cubic meter [µg/m^3]), 1,3-Butadiene (11.5 µg/m^3), and trichloroethylene (16.8 µg/m^3) were reported above their respective Residential RSLs in the soil gas sample collected from SVP-01. After applying the 3% attenuation factor, the reported concentrations remained in exceedance of the Residential RSL.

Ethylbenzene (8.2 µg/m^3) and vinyl chloride (1.96 µg/m^3) were reported above their respective residential RSLs in the sample collected from SVP-01. After applying the 3% attenuation factor, the reported concentrations were not in exceedance of the Residential RSL.

Methane, ethane, or ethene were not reported above their respective laboratory detection limits in the soil gas sample collected as part of this investigation.

6.0 CONCLUSIONS

Based on the scope of services described in this report and subject to the limitations described herein, Terracon concludes the following.

Inorganic constituent analytical data that included an elevated sodium adsorption ratio and specific conductance in soil samples; apparent elevated total dissolved solids, chlorides, and sulfates in the groundwater samples; and high levels of background arsenic and selenium can be naturally occurring. The observed analytical results could also be the result of agricultural and grazing activities on the property and in the area up-gradient of the site.

The presence of benzene, 1,3-Butadiene, trichloroethylene, ethylbenzene, and vinyl chloride in site soil gas are not natural occurring compounds and could be originating from former or current on-site or off-site activities. Additional investigation would likely be required to identify any potential sources of these compounds.

7.0 RECOMMENDATIONS

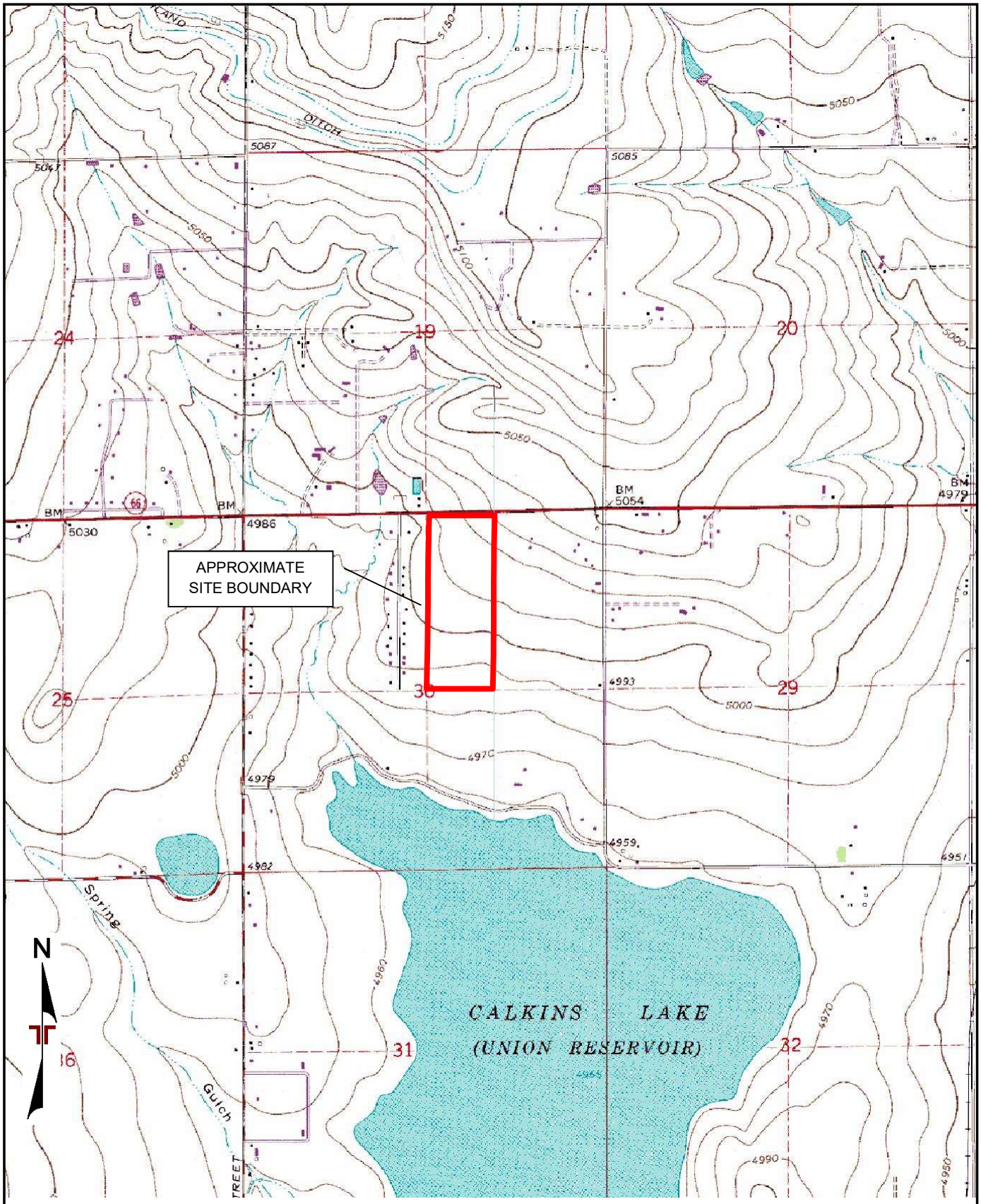
The objective of this investigation was to evaluate the presence of constituents of concern in the on-site soil and groundwater above relevant laboratory detection limits and/or regulatory limits and to determine a set of site-specific background data prior to the onset of O&G operations up-gradient of the site.

Based on the scope of services, limitations, and conclusions of this assessment, Terracon recommends continued periodic groundwater monitoring to establish a baseline for constituents reported during this investigation prior to the oil and gas facilities in the area becoming operational, and during active operation.

APPENDIX A – EXHIBITS

Exhibit 1 – Topographic Map

Exhibit 2 – Site Diagram



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: LONGMONT, CO (1/1/1979).

Project Manager: MJS	Project No. 22187033	Terracon 1831 Lefthand Cir Ste C Longmont, CO 80501-6768	TOPOGRAPHIC MAP	Exhibit
Drawn by: CSG	Scale: 1" = 2,000'		Knight Pad Site Baseline Study **State Highway 66 Weld County Road 3** **Longmont, CO**	1
Checked by: JCG	File Name: 22187033			
Approved by: JCG	Date: 10/15/2018			

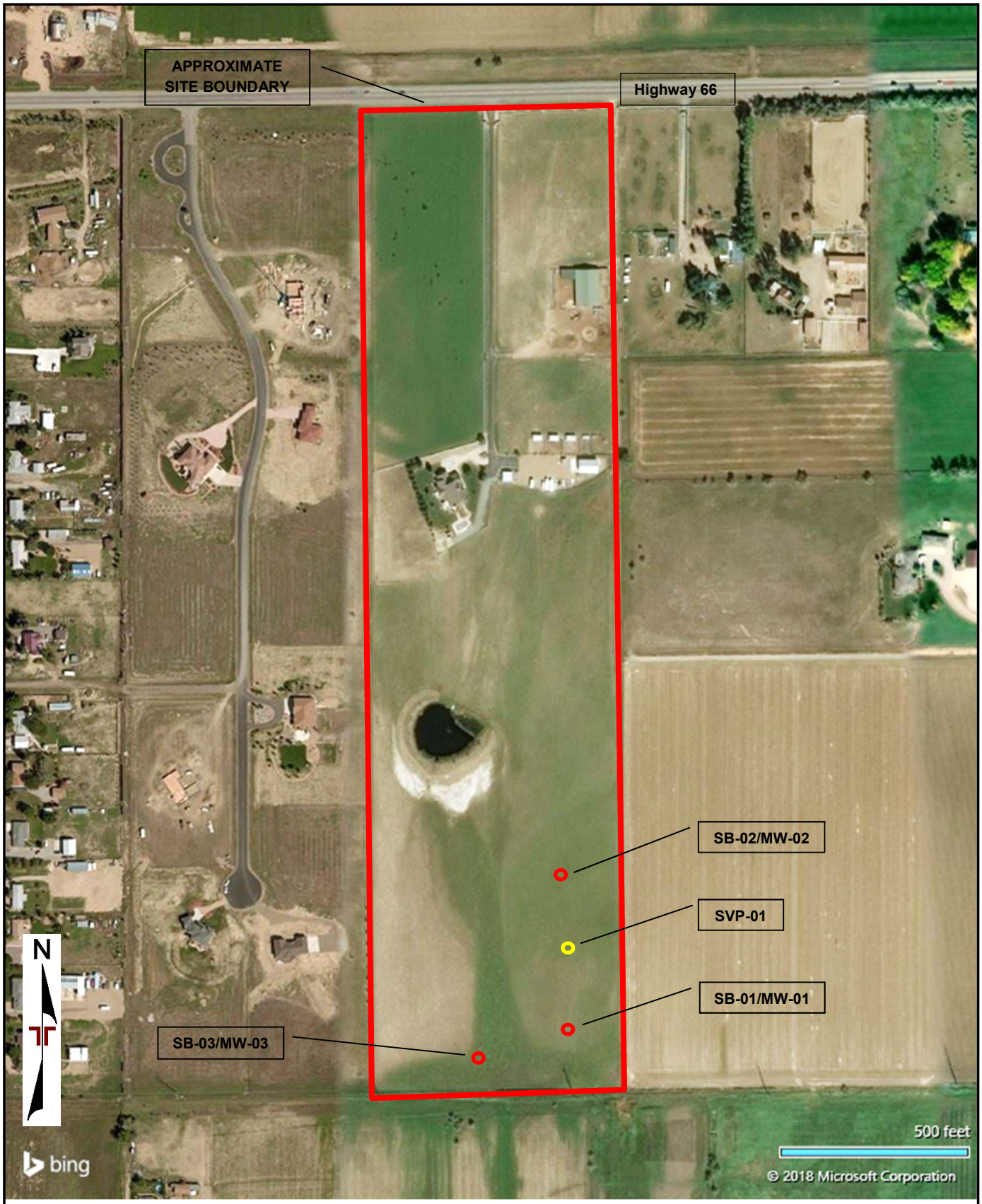


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: MJS Drawn by: CSG Checked by: JCG Approved by: JCG	Project No. 22187033 Scale: AS SHOWN File Name: 22187033 Date: 10/15/2018	Terracon 1831 Lefthand Cir Ste C Longmont, CO 80501-6768	SITE DIAGRAM Knight Pad Site Baseline Study State Highway 66 Weld County Road 3 Longmont, CO	Exhibit 2

APPENDIX B – TABLES AND SOIL BORING LOGS

Table 1
Soil Analytical Summary
Future Knight O&G Well Site
Longmont, Colorado
Terracon Project No. 22187033

Sample ID and Depth					SB-01 (8-12)	SB-02 (8-12)	SB-03 (15-19)
Collection Date					10/5/18	10/5/18	10/29/18
Parameter	Residential RSL	Industrial RSL	COGCC Concentration Levels	CDPHE GPV	mg/kg	mg/kg	mg/kg
VOC (8260B)							
Ethylbenzene	**5.8**	**25**	**100**	**100**	**0.00435**	<0.0025	<0.0025
1,2,4-Trimethylbenzene	**58**	**240**	**NE**	**NE**	**0.00755**	<0.005	<0.005
TPH - 500 mg/kg (COGCC Regulatory Guidance Threshold)							
TPH-GRO	**NE**	**NE**	**500**	**NE**	**0.199**	**0.199**	**0.508**
Metals							
Arsenic[1]	**0.68**	**3.0**	**0.39**	**NE**	**6.15**	**5.44**	**2.32**
Barium	**15,000**	**220,000**	**15,000**	**NE**	**57.1**	**46.4**	**52.1**
Chromium III	**NE**	**NE**	**120,000**	**NE**	**22**	**20.5**	**15.9**
Copper	**3,100**	**47,000**	**3,100**	**NE**	**14.2**	**15.8**	**13.9**
Lead	**400**	**800**	**400**	**NE**	**14.3**	**16.6**	**18.7**
Mercury	**11**	**46**	**23**	**NE**	**0.044**	**0.0411**	**0.0252**
Nickel	**1,500**	**22,000**	**1,600**	**NE**	**19.7**	**19.2**	**21**
Zinc	**23,000**	**350,000**	**23,000**	**NE**	**65.1**	**64.1**	**75.2**
Inorganics							
Sodium Adsorption Rate	**NE**	**NE**	**<12**	**NE**	**21.3**	**13.8**	**1.53**
Specific Conductance (µmhos/cm)	**NE**	**NE**	**<4,000**	**NE**	**5,540**	**3,200**	**2,010**
pH	**NE**	**NE**	**6-9**	**NE**	**8.14**	**7.95**	**7.79**

Only detected analytes shown (detected concentrations are **bold**)
RSL = EPA Regional Screening Level (May 2016)
CDPHE GPV = Colorado Department of Public Health and Environmental Groundwater Protection Value (March 2014)
NE = Not Established
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ORO = Oil Range Organics
COGCC = Colorado Oil and Gas Conservation Comission

Table 2
Groundwater Analytical Summary
Future Knight O&G Well Site
Longmont, Colorado
Terracon Project No. 22187033

Sample ID			MW-01	MW-02	MW-03
Collect Date			10/29/18	10/29/18	11/2/18
Parameter	CDPHE Reg. 41 Groundwater Standard[1]	COGCC Concentration Levels[2]	µg/L	µg/L	µg/L
Metals (6010B/7470A)					
Arsenic	**10**	NE	**10**	<10	<10
Barium	**2,000**	NE	**94.5**	**52.8**	**48**
Boron	**750**	NE	**432**	**433**	**508**
Chromium III	**100**	NE	**65.7**	**12.1**	**<10**
Selenium	**50**	NE	**2,290**	**1,170**	**81.6**
Copper	**1,300**	NE	<10	**10.1**	<10
PAHs (8270)					
Naphthalene	**140**	NE	<0.250	**0.296**	**0.252**
Other Organics					
Free Carbon Dioxide (mg/L)	NE	NE	**60.9**	**78.9**	<20.0
Inorganic Parameters					
Chloride (mg/L)	**250,000**	**76,210***	**1,270**	**555**	**173**
Sulfate (mg/L)	**250,000**	**757,630***	**61,500**	**35,800**	**4,500**
Total Solids, Dissolved (mg/L)	**400-No Limit**	NE	**58,500**	**30,600**	**7,270**

1) CDPHE GW Quality Standards – Regulation 41 Table A, Ground Water Organic Chemical Standards (June 30, 201
2) COGCC Concentration Levels = COGCC Table 910-1 (January 2015)

*) The COGCC cleanup standard for chloride and sulfate is 1.25 x background. Background concentrations from unimpacted wells were used to average and calculate an appropriate background concentration for this area.

Only detected analytes shown (detected concentrations are **bold**)
NE = Not Established
VOC = Volatile Organic Compounds
NA = Not Analyzed
COGCC = Colorado Oil and Gas Conservation Comission
M = Drinking Water Maximum Contaminant Level
TDS = Total Disolved Solids

Table 3
Soil Gas Analytical Summary
Future Knight O&G Well Site
Longmont, Colorado
Terracon Project No. 22187033

Sample ID			SVP-01
Collect Date			10/5/2018
Parameter	Residential RSL	Residential VISL[1]	µg/m^3
VOC (TO-15)			
Acetone	32,000	1,066,667	463
Benzene	0.36	12	19.1
1,3-Butadiene	0.094	3	11.5
Carbon disulfide	73	2,433	2.64
Chloroethane	10,000	333,333	8.56
Cyclohexane	630	21,000	4.84
1,1-Dichloroethene	210	7,000	3.34
Ethanol	NE	NE	89.5
Ethylbenzene	1.1	37	8.2
4-Ethyltoluene	NE	NE	6.25
Dichlorodifluoromethane	100	3,333	2.28
Heptane	NE	NE	12
n-Hexane	730	24,333	20
Methylene Chloride	100	3,333	1.85
Methyl Butyl Ketone	31	1,033	11.6
2-Butanone (MEK)	5,200	173,333	91.2
4-Methyl-2-pentanone (MIBK)	3,100	103,333	57
Methyl methacrylate	730	24,333	10.3
2-Propanol	210	7,000	16.1
Propene	3,100	103,333	130
Styrene	1,000	33,333	2.7
Tetrahydrofuran	2,100	70,000	18.2
Toluene	5,200	173,333	34.4
Trichloroethylene	0.48	16	16.8
1,2,4-Trimethylbenzene	7.3	243	5.82
2,2,4-Trimethylpentane	NE	NE	2.46
Vinyl chloride	0.17	6	1.96
m&p-Xylene	100	3,333	27.4
o-Xylene	100	3,333	7.95

1) VISL - Vapor Intrusion Screening Level (calculated by dividing the RSL for residential indoor air by the State approved 3% [0.03] attenuation factor).
RSL = USEPA Indoor Air Regional Screening Level (HQ=0.1 June 2017)
ASC = CDPHE Air Screening Concentrations, Remediation Goals (January 2016)
ND = Not Detected
NE = Not Established
NA = Not Applicable
Only detected analytes shown (detected concentrations are **bold**)

BORING LOG NO. SB-01

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION
0.0	**SILTY CLAY (CL-ML)**, brown silty clay, dry, stiff. Increasing sand and moisture with depth
4.0	**SANDY SILTY CLAY (CL-ML)**, light brown silty clay with sand, increasing moisture, trace gypsum
8.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, brown weathered claystone, dry, interbedded gypsum
12.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, silty claystone, dry, interbedded gypsum.
19.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, weathered claystone, increasing moisture with depth, interbedded gypsum/calcite

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
0				0.3
5				
10				9.7
15				4.6
				4.7
				4.7
20				
25				

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:

Abandonment Method:

See Appendices for description of field procedures.

See Appendices for description of laboratory procedures and additional data (if any).

See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Boring Started: 10-05-2018 | Boring Completed: 10-29-2018

Drill Rig: CME 55 | Logger:

Project No.: 22187033 | Exhibit: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ADEM SMART LOG 22187033.FUTURE KNIGHT WELL.GPJ TERRACON_DATATEMPLATE.GDT 11/12/18

BORING LOG NO. SB-01

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

GRAPHIC LOG	LOCATION See Exhbit A-2 DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
		SEDIMENTARY BEDROCK - CLAYSTONE, weathered claystone, increasing moisture with depth, interbedded gypsum/calcite *(continued)*	30 35 40	▽			
	41.0	***Boring Terminated at 41 Feet***					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:	See Appendices for description of field procedures.	Notes:
Abandonment Method:	See Appendices for description of laboratory procedures and additional data (if any). See Appendices for explanation of symbols and abbreviations.	

WATER LEVEL OBSERVATIONS

▽

Boring Started: 10-05-2018	Boring Completed: 10-29-2018
Drill Rig: CME 55	Logger:
Project No.: 22187033	Exhibit: B-2

BORING LOG NO. SB-02

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION
	SILTY CLAY (CL-ML), light brown clay, dry, stiff. Increasing sand and moisture with depth. traces of gypsum
9.0	**SANDY SILTY CLAY (CL-ML)**, light brown silty clay with sand, increasing moisture, trace gypsum
16.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, light brown weathered claystone, dry, stiff, interbedded gypsum

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
5				0.2
10				0.5
15				0
20				0
25				0.3

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:

Abandonment Method:

See Appendices for description of field procedures.

See Appendices for description of laboratory procedures and additional data (if any).

See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

water level rapidly rise from 30' to 1.5'

Boring Started: 10-05-2018 | Boring Completed: 10-29-2018

Drill Rig: CME 55 | Logger:

Project No.: 22187033 | Exhibit: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ADEM SMART LOG 22187033.FUTURE KNIGHT WELL.GPJ TERRACON_DATATEMPLATE.GDT 11/12/18

BORING LOG NO. SB-02

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

GRAPHIC LOG	LOCATION See Exhbit A-2 DEPTH — MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
	SEDIMENTARY BEDROCK - CLAYSTONE, light brown weathered claystone, dry, stiff, interbedded gypsum *(continued)*	30	▽			
		35				
	40.0 ***Boring Terminated at 40 Feet***	40				

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:

Abandonment Method:

See Appendices for description of field procedures.

See Appendices for description of laboratory procedures and additional data (if any).

See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽

▽ *water level rapidly rise from 30' to 1.5'*

Boring Started: 10-05-2018 | Boring Completed: 10-29-2018

Drill Rig: CME 55 | Logger:

Project No.: 22187033 | Exhibit: B-2

BORING LOG NO. SB-03

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
	SILTY CLAY WITH SAND (CL-ML), silty clay, dry, some fine sand and trace gypsum/calcite					0.8
		5				1.3
		10	▽			1.8
12.0	**SANDY LEAN CLAY (CL)**, clay with fine sands. decreasing silt content	15				4.6
17.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, weathered claystone, dry, stiff	20				0.3
		25				50.8

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:

Abandonment Method:

See Appendices for description of field procedures.

See Appendices for description of laboratory procedures and additional data (if any).

See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽

Boring Started: 11-02-2018 | Boring Completed: 11-02-2018

Drill Rig: CME 55 | Logger:

Project No.: 22187033 | Exhibit: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ADEM SMART LOG 22187033.FUTURE KNIGHT WELL.GPJ TERRACON_DATATEMPLATE.GDT 11/12/18

BORING LOG NO. SB-03

PROJECT: Future Knight O&G Well Site

CLIENT: City of Longmont
Longmont, CO

SITE: Future Knight O&G Well Site
Longmont, CO

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
	LOCATION See Exhbit A-2						
		SEDIMENTARY BEDROCK - CLAYSTONE, weathered claystone, dry, stiff *(continued)*					50.9
			30				7.5
			35				0.4
	40.0		40				
		Boring Terminated at 40 Feet					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:	See Appendices for description of field procedures.	Notes:
Abandonment Method:	See Appendices for description of laboratory procedures and additional data (if any). See Appendices for explanation of symbols and abbreviations.	

WATER LEVEL OBSERVATIONS

Boring Started: 11-02-2018	Boring Completed: 11-02-2018
Drill Rig: CME 55	Logger:
Project No.: 22187033	Exhibit: B-2

APPENDIX C – ANALYTICAL REPORT AND CHAIN OF CUSTODY

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 16, 2018

Terracon Consultants, Inc - Longmont, CO

Sample Delivery Group:	L1033066
Samples Received:	10/09/2018
Project Number:	22187033
Description:	Future Knight O&G Well Site

Report To: Michael Skridulis
1242 Bramwood Place
Longmont, CO 80501

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

SB-01 (8-12) L1033066-01 Solid

Collected by: M. Skridulis
Collected date/time: 10/05/18 10:00
Received date/time: 10/09/18 08:45

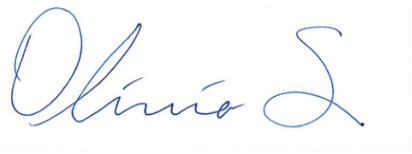
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1179162	1	10/14/18 18:54	10/15/18 14:14	CCE
Calculated Results	WG1179505	1	10/12/18 06:33	10/13/18 10:22	TRB
Wet Chemistry by Method 3060A/7196A	WG1179508	1	10/11/18 14:00	10/12/18 09:39	EEM
Wet Chemistry by Method 9045D	WG1178664	1	10/10/18 14:00	10/10/18 14:45	AMB
Wet Chemistry by Method 9050AMod	WG1178739	1	10/10/18 13:32	10/11/18 16:23	MJA
Mercury by Method 7471A	WG1179722	1	10/11/18 16:22	10/12/18 13:30	ABL
Metals (ICP) by Method 6010B	WG1179505	1	10/12/18 06:33	10/13/18 10:22	TRB
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1179733	1	10/10/18 09:17	10/12/18 02:02	RAS
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1180909	1	10/10/18 09:17	10/14/18 23:17	ACG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1181216	1	10/10/18 09:17	10/15/18 16:09	DWR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1180277	1	10/12/18 17:44	10/13/18 11:50	DMG

SB-02 (8-12) L1033066-02 Solid

Collected by: M. Skridulis
Collected date/time: 10/05/18 10:45
Received date/time: 10/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1179162	1	10/14/18 18:54	10/15/18 14:16	CCE
Calculated Results	WG1179505	1	10/12/18 06:33	10/13/18 10:24	TRB
Wet Chemistry by Method 3060A/7196A	WG1179508	1	10/11/18 14:00	10/12/18 09:40	EEM
Wet Chemistry by Method 9045D	WG1178664	1	10/10/18 14:00	10/10/18 14:45	AMB
Wet Chemistry by Method 9050AMod	WG1178739	1	10/10/18 13:32	10/11/18 16:23	MJA
Mercury by Method 7471A	WG1179722	1	10/11/18 16:22	10/12/18 13:33	ABL
Metals (ICP) by Method 6010B	WG1179505	1	10/12/18 06:33	10/13/18 10:24	TRB
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1179733	1	10/10/18 09:17	10/12/18 02:23	RAS
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1180909	1	10/10/18 09:17	10/14/18 23:35	ACG
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1180277	1	10/12/18 17:44	10/13/18 12:12	DMG

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



Olivia Studebaker
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	21.3		1	10/15/2018 14:14	WG1179162

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	22.0		1.00	1	10/13/2018 10:22	WG1179505

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	10/12/2018 09:39	WG1179508

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.14	T8	1	10/10/2018 14:45	WG1178664

Sample Narrative:

L1033066-01 WG1178664: 8.14 at 20.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	5540		10.0	1	10/11/2018 16:23	WG1178739

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0440	B	0.0200	1	10/12/2018 13:30	WG1179722

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.15		2.00	1	10/13/2018 10:22	WG1179505
Barium	57.1		0.500	1	10/13/2018 10:22	WG1179505
Boron	ND		10.0	1	10/13/2018 10:22	WG1179505
Cadmium	ND		0.500	1	10/13/2018 10:22	WG1179505
Chromium	22.0		1.00	1	10/13/2018 10:22	WG1179505
Copper	14.2		2.00	1	10/13/2018 10:22	WG1179505
Lead	14.3		0.500	1	10/13/2018 10:22	WG1179505
Nickel	19.7		2.00	1	10/13/2018 10:22	WG1179505
Selenium	ND		2.00	1	10/13/2018 10:22	WG1179505
Silver	ND		1.00	1	10/13/2018 10:22	WG1179505
Zinc	65.1		5.00	1	10/13/2018 10:22	WG1179505

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.199		0.100	1	10/12/2018 02:02	WG1179733
(S) a,a,a-Trifluorotoluene(FID)	*90.9*		*77.0-120*		*10/12/2018 02:02*	WG1179733

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.0250	1	10/14/2018 23:17	WG1180909
Acrylonitrile	ND		0.0125	1	10/14/2018 23:17	WG1180909
Benzene	ND		0.00100	1	10/14/2018 23:17	WG1180909
Bromobenzene	ND		0.0125	1	10/14/2018 23:17	WG1180909
Bromodichloromethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Bromoform	ND		0.0250	1	10/14/2018 23:17	WG1180909
Bromomethane	ND		0.0125	1	10/14/2018 23:17	WG1180909
n-Butylbenzene	ND		0.0125	1	10/14/2018 23:17	WG1180909
sec-Butylbenzene	ND		0.0125	1	10/14/2018 23:17	WG1180909
tert-Butylbenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
Carbon tetrachloride	ND		0.00500	1	10/14/2018 23:17	WG1180909
Chlorobenzene	ND		0.00250	1	10/14/2018 23:17	WG1180909
Chlorodibromomethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Chloroethane	ND		0.00500	1	10/14/2018 23:17	WG1180909
Chloroform	ND		0.00250	1	10/14/2018 23:17	WG1180909
Chloromethane	ND		0.0125	1	10/14/2018 23:17	WG1180909
2-Chlorotoluene	ND		0.00250	1	10/14/2018 23:17	WG1180909
4-Chlorotoluene	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,2-Dibromo-3-Chloropropane	ND		0.0250	1	10/14/2018 23:17	WG1180909
1,2-Dibromoethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Dibromomethane	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,2-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,3-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,4-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
Dichlorodifluoromethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,1-Dichloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,2-Dichloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,1-Dichloroethene	ND		0.00250	1	10/14/2018 23:17	WG1180909
cis-1,2-Dichloroethene	ND		0.00250	1	10/14/2018 23:17	WG1180909
trans-1,2-Dichloroethene	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,2-Dichloropropane	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,1-Dichloropropene	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,3-Dichloropropane	ND	J4	0.00500	1	10/14/2018 23:17	WG1180909
cis-1,3-Dichloropropene	ND		0.00250	1	10/14/2018 23:17	WG1180909
trans-1,3-Dichloropropene	ND	J4	0.00500	1	10/14/2018 23:17	WG1180909
2,2-Dichloropropane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Di-isopropyl ether	ND		0.00100	1	10/14/2018 23:17	WG1180909
Ethylbenzene	0.00435		0.00250	1	10/14/2018 23:17	WG1180909
Hexachloro-1,3-butadiene	ND		0.0250	1	10/14/2018 23:17	WG1180909
Isopropylbenzene	ND		0.00250	1	10/14/2018 23:17	WG1180909
p-Isopropyltoluene	ND		0.00500	1	10/14/2018 23:17	WG1180909
2-Butanone (MEK)	ND		0.0250	1	10/14/2018 23:17	WG1180909
Methylene Chloride	ND		0.0250	1	10/14/2018 23:17	WG1180909
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	10/14/2018 23:17	WG1180909
Methyl tert-butyl ether	ND		0.00100	1	10/14/2018 23:17	WG1180909
Naphthalene	ND		0.0125	1	10/14/2018 23:17	WG1180909
n-Propylbenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
Styrene	ND		0.0125	1	10/14/2018 23:17	WG1180909
1,1,1,2-Tetrachloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,1,2,2-Tetrachloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Tetrachloroethene	ND		0.00250	1	10/14/2018 23:17	WG1180909
Toluene	ND		0.00500	1	10/15/2018 16:09	WG1181216
1,2,3-Trichlorobenzene	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,2,4-Trichlorobenzene	ND		0.0125	1	10/14/2018 23:17	WG1180909
1,1,1-Trichloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichloroethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
Trichloroethene	ND		0.00100	1	10/14/2018 23:17	WG1180909
Trichlorofluoromethane	ND		0.00250	1	10/14/2018 23:17	WG1180909
1,2,3-Trichloropropane	ND		0.0125	1	10/14/2018 23:17	WG1180909
1,2,4-Trimethylbenzene	0.00755		0.00500	1	10/14/2018 23:17	WG1180909
1,2,3-Trimethylbenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
1,3,5-Trimethylbenzene	ND		0.00500	1	10/14/2018 23:17	WG1180909
Vinyl chloride	ND		0.00250	1	10/14/2018 23:17	WG1180909
Xylenes, Total	ND		0.00650	1	10/15/2018 16:09	WG1181216
(S) Toluene-d8	*107*		*75.0-131*		*10/14/2018 23:17*	WG1180909
(S) Toluene-d8	*117*		*75.0-131*		*10/15/2018 16:09*	WG1181216
(S) Dibromofluoromethane	*91.9*		*65.0-129*		*10/14/2018 23:17*	WG1180909
(S) Dibromofluoromethane	*78.8*		*65.0-129*		*10/15/2018 16:09*	WG1181216
(S) 4-Bromofluorobenzene	*92.8*		*67.0-138*		*10/14/2018 23:17*	WG1180909
(S) 4-Bromofluorobenzene	*89.8*		*67.0-138*		*10/15/2018 16:09*	WG1181216

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Acenaphthene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Acenaphthylene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Benzo(a)anthracene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Benzo(a)pyrene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Benzo(b)fluoranthene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Benzo(g,h,i)perylene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Benzo(k)fluoranthene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Chrysene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Dibenz(a,h)anthracene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Fluoranthene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Fluorene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Naphthalene	ND		0.0200	1	10/13/2018 11:50	WG1180277
Phenanthrene	ND		0.00600	1	10/13/2018 11:50	WG1180277
Pyrene	ND		0.00600	1	10/13/2018 11:50	WG1180277
1-Methylnaphthalene	ND		0.0200	1	10/13/2018 11:50	WG1180277
2-Methylnaphthalene	ND		0.0200	1	10/13/2018 11:50	WG1180277
2-Chloronaphthalene	ND		0.0200	1	10/13/2018 11:50	WG1180277
(S) p-Terphenyl-d14	*87.5*		*23.0-120*		*10/13/2018 11:50*	WG1180277
(S) Nitrobenzene-d5	*81.4*		*14.0-149*		*10/13/2018 11:50*	WG1180277
(S) 2-Fluorobiphenyl	*72.3*		*34.0-125*		*10/13/2018 11:50*	WG1180277

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	13.8		1	10/15/2018 14:16	WG1179162

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	20.5		1.00	1	10/13/2018 10:24	WG1179505

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	10/12/2018 09:40	WG1179508

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.95	T8	1	10/10/2018 14:45	WG1178664

Sample Narrative:

L1033066-02 WG1178664: 7.95 at 20.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3200		10.0	1	10/11/2018 16:23	WG1178739

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0411	B	0.0200	1	10/12/2018 13:33	WG1179722

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.44		2.00	1	10/13/2018 10:24	WG1179505
Barium	46.4		0.500	1	10/13/2018 10:24	WG1179505
Boron	ND		10.0	1	10/13/2018 10:24	WG1179505
Cadmium	ND		0.500	1	10/13/2018 10:24	WG1179505
Chromium	20.5		1.00	1	10/13/2018 10:24	WG1179505
Copper	15.8		2.00	1	10/13/2018 10:24	WG1179505
Lead	16.6		0.500	1	10/13/2018 10:24	WG1179505
Nickel	19.2		2.00	1	10/13/2018 10:24	WG1179505
Selenium	ND		2.00	1	10/13/2018 10:24	WG1179505
Silver	ND		1.00	1	10/13/2018 10:24	WG1179505
Zinc	64.1		5.00	1	10/13/2018 10:24	WG1179505

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.199		0.100	1	10/12/2018 02:23	WG1179733
(S) a,a,a-Trifluorotoluene(FID)	*90.4*		*77.0-120*		*10/12/2018 02:23*	WG1179733

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.0250	1	10/14/2018 23:35	WG1180909
Acrylonitrile	ND		0.0125	1	10/14/2018 23:35	WG1180909
Benzene	ND		0.00100	1	10/14/2018 23:35	WG1180909
Bromobenzene	ND		0.0125	1	10/14/2018 23:35	WG1180909
Bromodichloromethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Bromoform	ND		0.0250	1	10/14/2018 23:35	WG1180909
Bromomethane	ND		0.0125	1	10/14/2018 23:35	WG1180909
n-Butylbenzene	ND		0.0125	1	10/14/2018 23:35	WG1180909
sec-Butylbenzene	ND		0.0125	1	10/14/2018 23:35	WG1180909
tert-Butylbenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
Carbon tetrachloride	ND		0.00500	1	10/14/2018 23:35	WG1180909
Chlorobenzene	ND		0.00250	1	10/14/2018 23:35	WG1180909
Chlorodibromomethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Chloroethane	ND		0.00500	1	10/14/2018 23:35	WG1180909
Chloroform	ND		0.00250	1	10/14/2018 23:35	WG1180909
Chloromethane	ND		0.0125	1	10/14/2018 23:35	WG1180909
2-Chlorotoluene	ND		0.00250	1	10/14/2018 23:35	WG1180909
4-Chlorotoluene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,2-Dibromo-3-Chloropropane	ND		0.0250	1	10/14/2018 23:35	WG1180909
1,2-Dibromoethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Dibromomethane	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,2-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,3-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,4-Dichlorobenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
Dichlorodifluoromethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,1-Dichloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,2-Dichloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,1-Dichloroethene	ND		0.00250	1	10/14/2018 23:35	WG1180909
cis-1,2-Dichloroethene	ND		0.00250	1	10/14/2018 23:35	WG1180909
trans-1,2-Dichloroethene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,2-Dichloropropane	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,1-Dichloropropene	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,3-Dichloropropane	ND	J4	0.00500	1	10/14/2018 23:35	WG1180909
cis-1,3-Dichloropropene	ND		0.00250	1	10/14/2018 23:35	WG1180909
trans-1,3-Dichloropropene	ND	J4	0.00500	1	10/14/2018 23:35	WG1180909
2,2-Dichloropropane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Di-isopropyl ether	ND		0.00100	1	10/14/2018 23:35	WG1180909
Ethylbenzene	ND		0.00250	1	10/14/2018 23:35	WG1180909
Hexachloro-1,3-butadiene	ND		0.0250	1	10/14/2018 23:35	WG1180909
Isopropylbenzene	ND		0.00250	1	10/14/2018 23:35	WG1180909
p-Isopropyltoluene	ND		0.00500	1	10/14/2018 23:35	WG1180909
2-Butanone (MEK)	ND		0.0250	1	10/14/2018 23:35	WG1180909
Methylene Chloride	ND		0.0250	1	10/14/2018 23:35	WG1180909
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	10/14/2018 23:35	WG1180909
Methyl tert-butyl ether	ND		0.00100	1	10/14/2018 23:35	WG1180909
Naphthalene	ND		0.0125	1	10/14/2018 23:35	WG1180909
n-Propylbenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
Styrene	ND		0.0125	1	10/14/2018 23:35	WG1180909
1,1,1,2-Tetrachloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,1,2,2-Tetrachloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,1,2-Trichlorotrifluoroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Tetrachloroethene	ND		0.00250	1	10/14/2018 23:35	WG1180909
Toluene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,2,3-Trichlorobenzene	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,2,4-Trichlorobenzene	ND		0.0125	1	10/14/2018 23:35	WG1180909
1,1,1-Trichloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichloroethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
Trichloroethene	ND		0.00100	1	10/14/2018 23:35	WG1180909
Trichlorofluoromethane	ND		0.00250	1	10/14/2018 23:35	WG1180909
1,2,3-Trichloropropane	ND		0.0125	1	10/14/2018 23:35	WG1180909
1,2,4-Trimethylbenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,2,3-Trimethylbenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
1,3,5-Trimethylbenzene	ND		0.00500	1	10/14/2018 23:35	WG1180909
Vinyl chloride	ND		0.00250	1	10/14/2018 23:35	WG1180909
Xylenes, Total	ND		0.00650	1	10/14/2018 23:35	WG1180909
(S) Toluene-d8	*105*		*75.0-131*		*10/14/2018 23:35*	WG1180909
(S) Dibromofluoromethane	*91.9*		*65.0-129*		*10/14/2018 23:35*	WG1180909
(S) 4-Bromofluorobenzene	*90.1*		*67.0-138*		*10/14/2018 23:35*	WG1180909

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Acenaphthene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Acenaphthylene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Benzo(a)anthracene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Benzo(a)pyrene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Benzo(b)fluoranthene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Benzo(g,h,i)perylene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Benzo(k)fluoranthene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Chrysene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Dibenz(a,h)anthracene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Fluoranthene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Fluorene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Naphthalene	ND		0.0200	1	10/13/2018 12:12	WG1180277
Phenanthrene	ND		0.00600	1	10/13/2018 12:12	WG1180277
Pyrene	ND		0.00600	1	10/13/2018 12:12	WG1180277
1-Methylnaphthalene	ND		0.0200	1	10/13/2018 12:12	WG1180277
2-Methylnaphthalene	ND		0.0200	1	10/13/2018 12:12	WG1180277
2-Chloronaphthalene	ND		0.0200	1	10/13/2018 12:12	WG1180277
(S) p-Terphenyl-d14	*76.3*		*23.0-120*		*10/13/2018 12:12*	WG1180277
(S) Nitrobenzene-d5	*86.9*		*14.0-149*		*10/13/2018 12:12*	WG1180277
(S) 2-Fluorobiphenyl	*52.0*		*34.0-125*		*10/13/2018 12:12*	WG1180277

Method Blank (MB)

(MB) R3350040-1 10/12/18 09:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1032950-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1032950-06 10/12/18 09:24 • (DUP) R3350040-4 10/12/18 09:24

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	U	0.000	1	0.000		20

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

(LCS) R3350040-2 10/12/18 09:23 • (LCSD) R3350040-3 10/12/18 09:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	24.0	24.4	24.1	102	100	80.0-120			1.16	20

L1033058-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033058-02 10/12/18 09:25 • (MS) R3350040-5 10/12/18 09:35 • (MSD) R3350040-6 10/12/18 09:38

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	24.1	U	20.3	20.4	84.0	84.4	1	75.0-125			0.475	20

L1033058-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1033058-02 10/12/18 09:25 • (MS) R3350040-8 10/12/18 09:39

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	839	U	769	91.7	50	75.0-125	

L1032551-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1032551-04 10/10/18 14:45 • (DUP) R3349444-3 10/10/18 14:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.94	7.96	1	0.252		1

Sample Narrative:

OS: 7.94 at 21.8C

DUP: 7.96 at 21.5C

L1032866-17 Original Sample (OS) • Duplicate (DUP)

(OS) L1032866-17 10/10/18 14:45 • (DUP) R3349444-4 10/10/18 14:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.45	7.41	1	0.538		1

Sample Narrative:

OS: 7.45 at 21.6C

DUP: 7.41 at 21.3C

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

(LCS) R3349444-1 10/10/18 14:45 • (LCSD) R3349444-2 10/10/18 14:45

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	10.0	9.94	9.95	99.4	99.5	99.0-101			0.101	1

Sample Narrative:

LCS: 9.94 at 20.6C

LCSD: 9.95 at 20.7C

Method Blank (MB)

(MB) R3349871-1 10/11/18 16:23

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

L1032252-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1032252-01 10/11/18 16:23 • (DUP) R3349871-4 10/11/18 16:23

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	1630	1640	1	0.612		20

L1033066-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1033066-02 10/11/18 16:23 • (DUP) R3349871-5 10/11/18 16:23

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	3200	3210	1	0.312		20

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

(LCS) R3349871-2 10/11/18 16:23 • (LCSD) R3349871-3 10/11/18 16:23

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	1090	1080	1080	98.7	98.9	85.0-115			0.186	20

Method Blank (MB)

(MB) R3350197-1 10/12/18 12:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	0.00791	J	0.00280	0.0200

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

(LCS) R3350197-5 10/12/18 14:54 • (LCSD) R3350197-2 10/12/18 12:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.306	0.302	102	101	80.0-120			1.29	20

L1033038-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033038-01 10/12/18 12:19 • (MS) R3350197-3 10/12/18 12:21 • (MSD) R3350197-4 10/12/18 12:24

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.0191	0.290	0.272	90.3	84.4	1	75.0-125			6.25	20

Method Blank (MB)

(MB) R3350303-1 10/13/18 09:33

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Boron	U		1.26	10.0
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	U		0.590	5.00

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

(LCS) R3350303-2 10/13/18 09:36 • (LCSD) R3350303-3 10/13/18 09:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	97.0	95.8	97.0	95.8	80.0-120			1.22	20
Barium	100	102	100	102	100	80.0-120			1.23	20
Boron	100	96.3	97.5	96.3	97.5	80.0-120			1.25	20
Cadmium	100	96.6	95.5	96.6	95.5	80.0-120			1.22	20
Chromium	100	98.7	98.1	98.7	98.1	80.0-120			0.639	20
Copper	100	98.0	97.4	98.0	97.4	80.0-120			0.648	20
Lead	100	96.7	95.3	96.7	95.3	80.0-120			1.46	20
Nickel	100	98.5	97.2	98.5	97.2	80.0-120			1.31	20
Selenium	100	96.7	95.3	96.7	95.3	80.0-120			1.45	20
Silver	20.0	18.4	18.4	92.2	91.9	80.0-120			0.299	20
Zinc	100	95.9	94.7	95.9	94.7	80.0-120			1.25	20

L1033560-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033560-01 10/13/18 09:41 • (MS) R3350303-6 10/13/18 09:49 • (MSD) R3350303-7 10/13/18 09:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.31	97.6	94.5	95.3	92.2	1	75.0-125			3.20	20
Barium	100	92.4	193	188	101	95.1	1	75.0-125			2.82	20
Boron	100	ND	92.4	85.8	92.4	85.8	1	75.0-125			7.39	20
Cadmium	100	ND	96.2	93.0	96.1	92.9	1	75.0-125			3.39	20
Chromium	100	12.9	113	109	101	96.1	1	75.0-125			3.98	20

L1033560-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033560-01 10/13/18 09:41 • (MS) R3350303-6 10/13/18 09:49 • (MSD) R3350303-7 10/13/18 09:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper	100	6.55	107	102	100	95.7	1	75.0-125			4.31	20
Lead	100	7.28	106	102	98.3	94.3	1	75.0-125			3.82	20
Nickel	100	9.84	111	107	102	97.0	1	75.0-125			4.14	20
Selenium	100	ND	95.1	91.3	95.1	91.3	1	75.0-125			4.16	20
Silver	20.0	ND	18.7	18.0	93.6	90.2	1	75.0-125			3.73	20
Zinc	100	32.5	127	124	95.0	91.4	1	75.0-125			2.87	20

Method Blank (MB)

(MB) R3350020-3 10/11/18 19:54

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*96.6*			*77.0-120*

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

(LCS) R3350020-1 10/11/18 18:50 • (LCSD) R3350020-2 10/11/18 19:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.62	5.06	102	92.0	72.0-127			10.4	20
(S) a,a,a-Trifluorotoluene(FID)				*109*	*105*	*77.0-120*				

Method Blank (MB)

(MB) R3350739-3 10/14/18 18:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0137	0.0250
Acrylonitrile	U		0.00190	0.0125
Benzene	U		0.000400	0.00100
Bromobenzene	U		0.00105	0.0125
Bromodichloromethane	U		0.000788	0.00250
Bromoform	U		0.00598	0.0250
Bromomethane	U		0.00370	0.0125
n-Butylbenzene	U		0.00384	0.0125
sec-Butylbenzene	U		0.00253	0.0125
tert-Butylbenzene	U		0.00155	0.00500
Carbon tetrachloride	U		0.00108	0.00500
Chlorobenzene	U		0.000573	0.00250
Chlorodibromomethane	U		0.000450	0.00250
Chloroethane	U		0.00108	0.00500
Chloroform	U		0.000415	0.00250
Chloromethane	U		0.00139	0.0125
2-Chlorotoluene	U		0.000920	0.00250
4-Chlorotoluene	U		0.00113	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00510	0.0250
1,2-Dibromoethane	U		0.000525	0.00250
Dibromomethane	U		0.00100	0.00500
1,2-Dichlorobenzene	U		0.00145	0.00500
1,3-Dichlorobenzene	U		0.00170	0.00500
1,4-Dichlorobenzene	U		0.00197	0.00500
Dichlorodifluoromethane	U		0.000818	0.00250
1,1-Dichloroethane	U		0.000575	0.00250
1,2-Dichloroethane	U		0.000475	0.00250
1,1-Dichloroethene	U		0.000500	0.00250
cis-1,2-Dichloroethene	U		0.000690	0.00250
trans-1,2-Dichloroethene	U		0.00143	0.00500
1,2-Dichloropropane	U		0.00127	0.00500
1,1-Dichloropropene	U		0.000700	0.00250
1,3-Dichloropropane	U		0.00175	0.00500
cis-1,3-Dichloropropene	U		0.000678	0.00250
trans-1,3-Dichloropropene	U		0.00153	0.00500
2,2-Dichloropropane	U		0.000793	0.00250
Di-isopropyl ether	U		0.000350	0.00100
Ethylbenzene	U		0.000530	0.00250
Hexachloro-1,3-butadiene	U		0.0127	0.0250
Isopropylbenzene	U		0.000863	0.00250

Method Blank (MB)

(MB) R3350739-3 10/14/18 18:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00233	0.00500
2-Butanone (MEK)	U		0.0125	0.0250
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.0100	0.0250
Methyl tert-butyl ether	U		0.000295	0.00100
Naphthalene	U		0.00312	0.0125
n-Propylbenzene	U		0.00118	0.00500
Styrene	U		0.00273	0.0125
1,1,1,2-Tetrachloroethane	U		0.000500	0.00250
1,1,2,2-Tetrachloroethane	U		0.000390	0.00250
Tetrachloroethene	U		0.000700	0.00250
Toluene	U		0.00125	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000675	0.00250
1,2,3-Trichlorobenzene	U		0.000625	0.00250
1,2,4-Trichlorobenzene	U		0.00482	0.0125
1,1,1-Trichloroethane	U		0.000275	0.00250
1,1,2-Trichloroethane	U		0.000883	0.00250
Trichloroethene	U		0.000400	0.00100
Trichlorofluoromethane	U		0.000500	0.00250
1,2,3-Trichloropropane	U		0.00510	0.0125
1,2,3-Trimethylbenzene	U		0.00115	0.00500
1,2,4-Trimethylbenzene	U		0.00116	0.00500
1,3,5-Trimethylbenzene	U		0.00108	0.00500
Vinyl chloride	U		0.000683	0.00250
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*104*			*75.0-131*
(S) Dibromofluoromethane	*90.2*			*65.0-129*
(S) 4-Bromofluorobenzene	*86.4*			*67.0-138*

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

(LCS) R3350739-1 10/14/18 16:57 • (LCSD) R3350739-2 10/14/18 17:15

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.694	0.552	111	88.4	10.0-160			22.7	31
Acrylonitrile	0.625	0.621	0.616	99.4	98.5	45.0-153			0.884	22
Benzene	0.125	0.132	0.123	106	98.6	70.0-123			7.06	20
Bromobenzene	0.125	0.111	0.104	88.6	82.9	73.0-121			6.73	20
Bromodichloromethane	0.125	0.109	0.109	87.2	87.1	73.0-121			0.110	20

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

(LCS) R3350739-1 10/14/18 16:57 • (LCSD) R3350739-2 10/14/18 17:15

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	0.125	0.102	0.0995	81.7	79.6	64.0-132			2.59	20
Bromomethane	0.125	0.126	0.113	101	90.7	56.0-147			10.4	20
n-Butylbenzene	0.125	0.0954	0.0922	76.3	73.8	68.0-135			3.41	20
sec-Butylbenzene	0.125	0.101	0.0937	80.4	75.0	74.0-130			7.01	20
tert-Butylbenzene	0.125	0.107	0.0982	85.5	78.6	75.0-127			8.47	20
Carbon tetrachloride	0.125	0.101	0.0996	80.6	79.7	66.0-128			1.16	20
Chlorobenzene	0.125	0.104	0.0972	83.4	77.8	76.0-128			6.96	20
Chlorodibromomethane	0.125	0.121	0.115	97.0	92.3	74.0-127			4.97	20
Chloroethane	0.125	0.115	0.104	91.7	83.4	61.0-134			9.47	20
Chloroform	0.125	0.107	0.101	85.5	81.0	72.0-123			5.41	20
Chloromethane	0.125	0.133	0.124	106	99.0	51.0-138			6.98	20
2-Chlorotoluene	0.125	0.122	0.112	97.4	89.9	75.0-124			8.02	20
4-Chlorotoluene	0.125	0.107	0.102	85.7	81.7	75.0-124			4.76	20
1,2-Dibromo-3-Chloropropane	0.125	0.108	0.112	86.0	90.0	59.0-130			4.54	20
1,2-Dibromoethane	0.125	0.111	0.107	88.6	85.7	74.0-128			3.37	20
Dibromomethane	0.125	0.107	0.116	85.8	92.5	75.0-122			7.52	20
1,2-Dichlorobenzene	0.125	0.126	0.124	101	99.3	76.0-124			1.29	20
1,3-Dichlorobenzene	0.125	0.108	0.102	86.4	81.7	76.0-125			5.49	20
1,4-Dichlorobenzene	0.125	0.109	0.104	87.5	83.0	77.0-121			5.25	20
Dichlorodifluoromethane	0.125	0.0719	0.0678	57.5	54.2	43.0-156			5.87	20
1,1-Dichloroethane	0.125	0.121	0.119	96.4	95.2	70.0-127			1.27	20
1,2-Dichloroethane	0.125	0.110	0.109	88.3	86.9	65.0-131			1.52	20
1,1-Dichloroethene	0.125	0.107	0.106	85.6	84.9	65.0-131			0.760	20
cis-1,2-Dichloroethene	0.125	0.146	0.139	117	111	73.0-125			5.13	20
trans-1,2-Dichloroethene	0.125	0.109	0.102	87.4	81.7	71.0-125			6.63	20
1,2-Dichloropropane	0.125	0.112	0.107	89.5	85.7	74.0-125			4.35	20
1,1-Dichloropropene	0.125	0.122	0.117	98.0	93.6	73.0-125			4.64	20
1,3-Dichloropropane	0.125	0.101	0.0943	80.5	75.5	80.0-125		J4	6.46	20
cis-1,3-Dichloropropene	0.125	0.119	0.115	95.2	92.2	76.0-127			3.21	20
trans-1,3-Dichloropropene	0.125	0.166	0.161	133	129	73.0-127	J4	J4	3.18	20
2,2-Dichloropropane	0.125	0.122	0.121	97.2	96.8	59.0-135			0.373	20
Di-isopropyl ether	0.125	0.113	0.113	90.2	90.4	60.0-136			0.195	20
Ethylbenzene	0.125	0.108	0.101	86.3	81.1	74.0-126			6.21	20
Hexachloro-1,3-butadiene	0.125	0.169	0.172	135	137	57.0-150			1.88	20
Isopropylbenzene	0.125	0.111	0.106	88.7	84.6	72.0-127			4.74	20
p-Isopropyltoluene	0.125	0.0974	0.0917	77.9	73.3	72.0-133			6.09	20
2-Butanone (MEK)	0.625	0.858	0.772	137	124	30.0-160			10.5	24
Methylene Chloride	0.125	0.0940	0.0942	75.2	75.4	68.0-123			0.275	20
4-Methyl-2-pentanone (MIBK)	0.625	0.716	0.707	115	113	56.0-143			1.24	20
Methyl tert-butyl ether	0.125	0.108	0.110	86.7	88.1	66.0-132			1.51	20

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

(LCS) R3350739-1 10/14/18 16:57 • (LCSD) R3350739-2 10/14/18 17:15

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.125	0.116	0.116	92.6	93.1	59.0-130			0.544	20
n-Propylbenzene	0.125	0.125	0.120	99.8	95.9	74.0-126			4.08	20
Styrene	0.125	0.112	0.105	90.0	84.1	72.0-127			6.68	20
1,1,1,2-Tetrachloroethane	0.125	0.155	0.149	124	119	74.0-129			3.40	20
1,1,2,2-Tetrachloroethane	0.125	0.124	0.125	99.0	100	68.0-128			1.09	20
Tetrachloroethene	0.125	0.129	0.118	103	94.2	70.0-136			9.13	20
Toluene	0.125	0.108	0.104	86.5	83.1	75.0-121			4.05	20
1,1,2-Trichlorotrifluoroethane	0.125	0.0911	0.0852	72.9	68.1	61.0-139			6.73	20
1,2,3-Trichlorobenzene	0.125	0.126	0.126	101	101	59.0-139			0.294	20
1,2,4-Trichlorobenzene	0.125	0.131	0.135	104	108	62.0-137			3.07	20
1,1,1-Trichloroethane	0.125	0.127	0.124	101	99.5	69.0-126			1.70	20
1,1,2-Trichloroethane	0.125	0.116	0.110	93.2	88.4	78.0-123			5.30	20
Trichloroethene	0.125	0.118	0.113	94.4	90.1	76.0-126			4.67	20
Trichlorofluoromethane	0.125	0.108	0.105	86.8	83.7	61.0-142			3.54	20
1,2,3-Trichloropropane	0.125	0.124	0.118	98.8	94.4	67.0-129			4.58	20
1,2,3-Trimethylbenzene	0.125	0.121	0.115	97.1	91.8	74.0-124			5.66	20
1,2,4-Trimethylbenzene	0.125	0.109	0.104	87.3	83.0	70.0-126			4.99	20
1,3,5-Trimethylbenzene	0.125	0.119	0.113	95.0	90.1	73.0-127			5.34	20
Vinyl chloride	0.125	0.161	0.154	129	123	63.0-134			4.48	20
Xylenes, Total	0.375	0.349	0.331	93.1	88.3	72.0-127			5.29	20
(S) Toluene-d8				*103*	*101*	*75.0-131*				
(S) Dibromofluoromethane				*93.4*	*96.8*	*65.0-129*				
(S) 4-Bromofluorobenzene				*88.9*	*88.1*	*67.0-138*				

L1033038-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033038-06 10/14/18 21:08 • (MS) R3350739-4 10/15/18 01:07 • (MSD) R3350739-5 10/15/18 01:26

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.808	U	0.702	0.289	87.0	35.7	1	10.0-160		J3	83.5	40
Acrylonitrile	0.808	U	0.716	0.659	88.7	81.6	1	10.0-160			8.35	40
Benzene	0.162	U	0.135	0.0695	83.3	43.0	1	10.0-149		J3	63.8	37
Bromobenzene	0.162	U	0.149	0.0915	91.9	56.6	1	10.0-156		J3	47.5	38
Bromodichloromethane	0.162	U	0.155	0.0908	95.7	56.2	1	10.0-143		J3	52.0	37
Bromoform	0.162	U	0.136	0.106	84.3	65.5	1	10.0-146			25.1	36
Bromomethane	0.162	U	0.0553	0.0285	34.3	17.6	1	10.0-149		J3	64.1	38
n-Butylbenzene	0.162	U	0.147	0.0695	91.1	43.0	1	10.0-160		J3	71.7	40
sec-Butylbenzene	0.162	U	0.138	0.0656	85.5	40.6	1	10.0-159		J3	71.3	39
tert-Butylbenzene	0.162	U	0.149	0.0673	92.0	41.7	1	10.0-156		J3	75.3	39

L1033038-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033038-06 10/14/18 21:08 • (MS) R3350739-4 10/15/18 01:07 • (MSD) R3350739-5 10/15/18 01:26

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	0.162	U	0.111	0.0444	69.0	27.5	1	10.0-145		J3	86.1	37
Chlorobenzene	0.162	U	0.127	0.0659	78.6	40.8	1	10.0-152		J3	63.3	39
Chlorodibromomethane	0.162	U	0.161	0.114	99.5	70.3	1	10.0-146			34.3	37
Chloroethane	0.162	U	0.0419	0.0217	25.9	13.5	1	10.0-146		J3	63.3	40
Chloroform	0.162	U	0.129	0.0709	79.6	43.9	1	10.0-146		J3	57.8	37
Chloromethane	0.162	U	0.0861	0.0368	53.3	22.8	1	10.0-159		J3	80.2	37
2-Chlorotoluene	0.162	U	0.151	0.0833	93.7	51.5	1	10.0-159		J3	58.0	38
4-Chlorotoluene	0.162	U	0.152	0.0758	93.8	46.9	1	10.0-155		J3	66.6	39
1,2-Dibromo-3-Chloropropane	0.162	U	0.112	0.112	69.4	69.4	1	10.0-151			0.0749	39
1,2-Dibromoethane	0.162	U	0.130	0.100	80.3	62.2	1	10.0-148			25.4	34
Dibromomethane	0.162	U	0.127	0.102	78.6	63.0	1	10.0-147			22.0	35
1,2-Dichlorobenzene	0.162	U	0.162	0.109	101	67.6	1	10.0-155		J3	39.2	37
1,3-Dichlorobenzene	0.162	U	0.138	0.0795	85.2	49.2	1	10.0-153		J3	53.6	38
1,4-Dichlorobenzene	0.162	U	0.140	0.0854	86.6	52.8	1	10.0-151		J3	48.5	38
Dichlorodifluoromethane	0.162	U	0.0920	0.0343	56.9	21.3	1	10.0-160		J3	91.3	35
1,1-Dichloroethane	0.162	U	0.136	0.0685	84.3	42.4	1	10.0-147		J3	66.2	37
1,2-Dichloroethane	0.162	U	0.133	0.0993	82.3	61.5	1	10.0-148			29.0	35
1,1-Dichloroethene	0.162	U	0.101	0.0424	62.5	26.2	1	10.0-155		J3	81.8	37
cis-1,2-Dichloroethene	0.162	U	0.148	0.0821	91.8	50.8	1	10.0-149		J3	57.4	37
trans-1,2-Dichloroethene	0.162	U	0.0847	0.0358	52.4	22.2	1	10.0-150		J3	81.2	37
1,2-Dichloropropane	0.162	U	0.137	0.0763	85.0	47.2	1	10.0-148		J3	57.1	37
1,1-Dichloropropene	0.162	U	0.116	0.0449	71.8	27.8	1	10.0-153		J3	88.3	35
1,3-Dichloropropane	0.162	U	0.128	0.0938	79.5	58.1	1	10.0-154			31.1	35
cis-1,3-Dichloropropene	0.162	U	0.149	0.0925	91.9	57.3	1	10.0-151		J3	46.5	37
trans-1,3-Dichloropropene	0.162	U	0.202	0.142	125	87.9	1	10.0-148			35.0	37
2,2-Dichloropropane	0.162	U	0.0974	0.0460	60.3	28.4	1	10.0-138		J3	71.7	36
Di-isopropyl ether	0.162	U	0.136	0.0906	84.0	56.1	1	10.0-147		J3	39.9	36
Ethylbenzene	0.162	U	0.139	0.0624	86.3	38.6	1	10.0-160		J3	76.4	38
Hexachloro-1,3-butadiene	0.162	U	0.248	0.127	154	78.8	1	10.0-160		J3	64.4	40
Isopropylbenzene	0.162	U	0.150	0.0686	92.6	42.4	1	10.0-155		J3	74.3	38
p-Isopropyltoluene	0.162	U	0.131	0.0653	81.1	40.4	1	10.0-160		J3	67.0	40
2-Butanone (MEK)	0.808	U	1.38	1.19	171	147	1	10.0-160	J5		14.7	40
Methylene Chloride	0.162	U	0.0996	0.0574	61.6	35.5	1	10.0-141		J3	53.8	37
4-Methyl-2-pentanone (MIBK)	0.808	U	0.795	0.710	98.4	87.9	1	10.0-160			11.2	35
Methyl tert-butyl ether	0.162	U	0.121	0.102	75.0	63.1	1	11.0-147			17.3	35
Naphthalene	0.162	U	0.182	0.148	112	91.9	1	10.0-160			20.1	36
n-Propylbenzene	0.162	U	0.176	0.0824	109	51.0	1	10.0-158		J3	72.6	38
Styrene	0.162	U	0.154	0.0873	95.1	54.0	1	10.0-160		J3	55.1	40
1,1,1,2-Tetrachloroethane	0.162	U	0.198	0.113	122	70.0	1	10.0-149		J3	54.4	39

L1033038-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1033038-06 10/14/18 21:08 • (MS) R3350739-4 10/15/18 01:07 • (MSD) R3350739-5 10/15/18 01:26

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,1,2,2-Tetrachloroethane	0.162	U	0.145	0.136	89.5	83.9	1	10.0-160			6.44	35
Tetrachloroethene	0.162	U	0.136	0.0533	84.3	33.0	1	10.0-156		J3	87.5	39
Toluene	0.162	U	0.136	0.0647	84.4	40.1	1	10.0-156		J3	71.3	38
1,1,2-Trichlorotrifluoroethane	0.162	U	0.0924	0.0328	57.2	20.3	1	10.0-160		J3	95.2	36
1,2,3-Trichlorobenzene	0.162	U	0.161	0.130	99.6	80.5	1	10.0-160			21.2	40
1,2,4-Trichlorobenzene	0.162	U	0.175	0.125	108	77.6	1	10.0-160			33.2	40
1,1,1-Trichloroethane	0.162	U	0.153	0.0608	94.5	37.7	1	10.0-144		J3	86.0	35
1,1,2-Trichloroethane	0.162	U	0.152	0.118	94.2	72.7	1	10.0-160			25.7	35
Trichloroethene	0.162	U	0.133	0.0613	82.1	37.9	1	10.0-156		J3	73.5	38
Trichlorofluoromethane	0.162	U	0.0501	0.0258	31.0	16.0	1	10.0-160		J3	64.0	40
1,2,3-Trichloropropane	0.162	U	0.156	0.138	96.5	85.7	1	10.0-156			11.9	35
1,2,3-Trimethylbenzene	0.162	U	0.176	0.0998	109	61.8	1	10.0-160		J3	55.1	36
1,2,4-Trimethylbenzene	0.162	U	0.241	0.102	149	63.2	1	10.0-160		J3	81.0	36
1,3,5-Trimethylbenzene	0.162	U	0.183	0.0849	113	52.5	1	10.0-160		J3	73.1	38
Vinyl chloride	0.162	U	0.0975	0.0405	60.3	25.0	1	10.0-160		J3	82.7	37
Xylenes, Total	0.485	U	0.485	0.214	100	44.2	1	10.0-160		J3	77.4	38
(S) Toluene-d8					*104*	*102*		*75.0-131*				
(S) Dibromofluoromethane					*87.1*	*95.9*		*65.0-129*				
(S) 4-Bromofluorobenzene					*96.9*	*96.6*		*67.0-138*				

Method Blank (MB)

(MB) R3350920-3 10/15/18 14:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*116*			*75.0-131*
(S) Dibromofluoromethane	*79.3*			*65.0-129*
(S) 4-Bromofluorobenzene	*88.6*			*67.0-138*

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

(LCS) R3350920-1 10/15/18 13:25 • (LCSD) R3350920-2 10/15/18 13:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Toluene	0.125	0.120	0.117	95.6	93.5	75.0-121			2.29	20
Xylenes, Total	0.375	0.331	0.321	88.3	85.6	72.0-127			3.07	20
(S) Toluene-d8				*107*	*107*	*75.0-131*				
(S) Dibromofluoromethane				*89.4*	*91.8*	*65.0-129*				
(S) 4-Bromofluorobenzene				*94.5*	*91.3*	*67.0-138*				

Method Blank (MB)

(MB) R3350346-3 10/13/18 04:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	*81.9*			*14.0-149*
(S) 2-Fluorobiphenyl	*90.3*			*34.0-125*
(S) p-Terphenyl-d14	*95.4*			*23.0-120*

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

(LCS) R3350346-1 10/13/18 03:15 • (LCSD) R3350346-2 10/13/18 03:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.0671	0.0725	83.9	90.6	50.0-126			7.74	20
Acenaphthene	0.0800	0.0633	0.0694	79.1	86.8	50.0-120			9.19	20
Acenaphthylene	0.0800	0.0637	0.0698	79.6	87.3	50.0-120			9.14	20
Benzo(a)anthracene	0.0800	0.0634	0.0692	79.3	86.5	45.0-120			8.75	20
Benzo(a)pyrene	0.0800	0.0580	0.0611	72.5	76.4	42.0-120			5.21	20
Benzo(b)fluoranthene	0.0800	0.0643	0.0697	80.4	87.1	42.0-121			8.06	20
Benzo(g,h,i)perylene	0.0800	0.0667	0.0729	83.4	91.1	45.0-125			8.88	20
Benzo(k)fluoranthene	0.0800	0.0692	0.0754	86.5	94.3	49.0-125			8.58	20
Chrysene	0.0800	0.0679	0.0741	84.9	92.6	49.0-122			8.73	20
Dibenz(a,h)anthracene	0.0800	0.0677	0.0741	84.6	92.6	47.0-125			9.03	20
Fluoranthene	0.0800	0.0696	0.0769	87.0	96.1	49.0-129			9.97	20

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

(LCS) R3350346-1 10/13/18 03:15 • (LCSD) R3350346-2 10/13/18 03:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.0800	0.0614	0.0670	76.8	83.8	49.0-120			8.72	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0687	0.0747	85.9	93.4	46.0-125			8.37	20
Naphthalene	0.0800	0.0591	0.0653	73.9	81.6	50.0-120			9.97	20
Phenanthrene	0.0800	0.0606	0.0679	75.8	84.9	47.0-120			11.4	20
Pyrene	0.0800	0.0647	0.0704	80.9	88.0	43.0-123			8.44	20
1-Methylnaphthalene	0.0800	0.0617	0.0685	77.1	85.6	51.0-121			10.4	20
2-Methylnaphthalene	0.0800	0.0562	0.0624	70.3	78.0	50.0-120			10.5	20
2-Chloronaphthalene	0.0800	0.0633	0.0702	79.1	87.8	50.0-120			10.3	20
(S) Nitrobenzene-d5				*99.9*	*95.1*	*14.0-149*				
(S) 2-Fluorobiphenyl				*105*	*101*	*34.0-125*				
(S) p-Terphenyl-d14				*113*	*110*	*23.0-120*				

L1032919-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1032919-01 10/13/18 05:01 • (MS) R3350346-4 10/13/18 05:23 • (MSD) R3350346-5 10/13/18 07:40

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0987	ND	0.0761	0.0916	77.1	92.8	1	10.0-145			18.4	30
Acenaphthene	0.0987	ND	0.0738	0.0853	74.8	86.4	1	14.0-127			14.4	27
Acenaphthylene	0.0987	ND	0.0735	0.0861	74.5	87.3	1	21.0-124			15.8	25
Benzo(a)anthracene	0.0987	ND	0.0685	0.0842	69.4	85.3	1	10.0-139			20.5	30
Benzo(a)pyrene	0.0987	ND	0.0735	0.0903	74.5	91.5	1	10.0-141			20.5	31
Benzo(b)fluoranthene	0.0987	ND	0.0694	0.0911	70.3	92.3	1	10.0-140			27.1	36
Benzo(g,h,i)perylene	0.0987	ND	0.0743	0.0916	75.3	92.8	1	10.0-140			20.8	33
Benzo(k)fluoranthene	0.0987	ND	0.0770	0.0864	78.0	87.5	1	10.0-137			11.5	31
Chrysene	0.0987	ND	0.0743	0.0907	75.3	91.9	1	10.0-145			19.9	30
Dibenz(a,h)anthracene	0.0987	ND	0.0745	0.0913	75.5	92.5	1	10.0-132			20.2	31
Fluoranthene	0.0987	ND	0.0784	0.0956	79.4	96.9	1	10.0-153			19.9	33
Fluorene	0.0987	ND	0.0700	0.0837	70.9	84.8	1	11.0-130			17.8	29
Indeno(1,2,3-cd)pyrene	0.0987	ND	0.0752	0.0933	76.1	94.5	1	10.0-137			21.5	32
Naphthalene	0.0987	ND	0.0727	0.0813	73.6	82.4	1	10.0-135			11.2	27
Phenanthrene	0.0987	ND	0.0702	0.0859	71.1	87.0	1	10.0-144			20.1	31
Pyrene	0.0987	ND	0.0716	0.0855	72.5	86.6	1	10.0-148			17.8	35
1-Methylnaphthalene	0.0987	ND	0.0749	0.0842	75.9	85.3	1	10.0-142			11.6	28
2-Methylnaphthalene	0.0987	ND	0.0685	0.0768	69.4	77.8	1	10.0-137			11.4	28
2-Chloronaphthalene	0.0987	ND	0.0756	0.0863	76.6	87.4	1	29.0-120			13.1	24
(S) Nitrobenzene-d5					*83.2*	*98.3*		*14.0-149*				
(S) 2-Fluorobiphenyl					*87.8*	*99.2*		*34.0-125*				
(S) p-Terphenyl-d14					*90.8*	*107*		*23.0-120*				

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

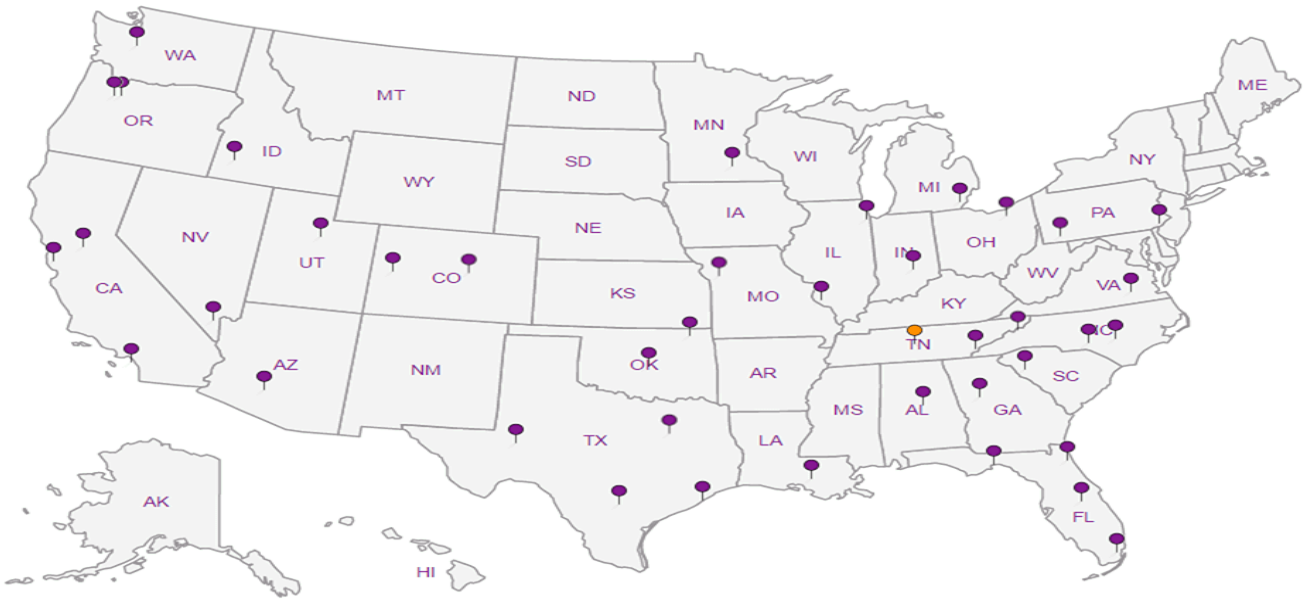
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Terracon - Longmont
~~12831~~ 1831 **Lefthand Circle, Suite C**
Longmont, CO 80501

Billing Information: **Same as Address**

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1633066

F067

Report to: Mike Skridulis

Email To: Mike.Skridulis@terracon.com

Project Description: **Future Knight O&G Well Site**

City/State Collected: Longmont CO

Phone: **303-454-5249**
Fax: **970-484-0454**

Client Project # **22187033**

Lab Project #

Collected by (print): M. Skridulis

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: STANDARD

Acctnum: **TERRALCO**
Template:
Prelogin:
TSR: **Daphne Richards**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC8260, TPH-GRO - 4oz Soil Jar	TPH-DRO/TPH-ORO - 4oz Soil Jar	PAHSIM - 4oz Soil Jar	SPCON, pH - 4oz Soil Jar	SAR - 4oz Soil Jar	Metals - 4oz Soil Jar	Arsenic, barium, cadmium, chromium 3, chromium 6, copper, lead, mercury, nickel, selenium, silver, zinc				Remarks	Sample # (lab only)
SB-01 (8-12)	G	SS		10/5/18	1000	6	X	X	X	X	X		X	X				-01
SB-02 (8-12)	G	SS		10/5/18	1045	6	X	X	X	X	X		X	X				02

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

Remarks: FedEx: 4510 1654 8157

RAD SCREEN: <0.5 mR/hr ____ Temp ____ Flow ____ Other ____

Samples returned via: __ UPS X FedEx __ Courier

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP X N
COC Signed/Accurate: X __N
Bottles arrive intact: X __N
Correct bottles used: X __N
Sufficient volume sent: X __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	10/8/18	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR

Temp: -0.2°C 3.5 3.3 Bottles Received: 12

Date: 10/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

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ANALYTICAL REPORT

October 18, 2018

Terracon Consultants, Inc - Longmont, CO

Sample Delivery Group:	L1034258
Samples Received:	10/12/2018
Project Number:	22187033
Description:	Future Knight O&G Well Site

Report To: Mike Skridulis
1242 Bramwood Place
Longmont, CO 80501

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

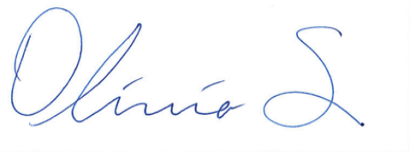
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

SVP-01 L1034258-01 Air

Collected by	Collected date/time	Received date/time
M. Skridulis	10/05/18 10:30	10/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015M	WG1181520	1	10/17/18 11:08	10/17/18 11:08	MEL
Volatile Organic Compounds (MS) by Method TO-15	WG1180454	2	10/14/18 02:14	10/14/18 02:14	MBF

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



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Volatile Organic Compounds (GC) by Method 8015M

Analyte	CAS #	Mol. Wt.	RDL1 ppmv	RDL2 mg/m3	Result ppmv	Result mg/m3	Qualifier	Dilution	Batch
Methane	74-82-8	16	10.0	6.54	ND	ND		1	WG1181520
Ethane	74-84-0	30	10.0	12.3	ND	ND		1	WG1181520
Ethene	74-85-1	28	10.0	11.5	ND	ND		1	WG1181520

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	195	463	E	2	WG1180454
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG1180454
Benzene	71-43-2	78.10	0.400	1.28	5.99	19.1		2	WG1180454
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG1180454
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG1180454
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG1180454
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG1180454
1,3-Butadiene	106-99-0	54.10	4.00	8.85	5.20	11.5		2	WG1180454
Carbon disulfide	75-15-0	76.10	0.400	1.24	0.848	2.64		2	WG1180454
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG1180454
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG1180454
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG1180454
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG1180454
Chloromethane	74-87-3	50.50	0.400	0.826	4.15	8.56		2	WG1180454
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG1180454
Cyclohexane	110-82-7	84.20	0.400	1.38	1.41	4.84		2	WG1180454
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG1180454
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG1180454
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG1180454
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG1180454
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG1180454
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG1180454
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG1180454
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	0.844	3.34		2	WG1180454
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG1180454
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG1180454
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG1180454
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG1180454
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG1180454
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG1180454
Ethanol	64-17-5	46.10	1.26	2.38	47.4	89.5		2	WG1180454
Ethylbenzene	100-41-4	106	0.400	1.73	1.89	8.20		2	WG1180454
4-Ethyltoluene	622-96-8	120	0.400	1.96	1.27	6.25		2	WG1180454
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	ND	ND		2	WG1180454
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	0.462	2.28		2	WG1180454
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG1180454
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG1180454
Heptane	142-82-5	100	0.400	1.64	2.95	12.0		2	WG1180454
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG1180454
n-Hexane	110-54-3	86.20	0.400	1.41	5.69	20.0		2	WG1180454
Isopropylbenzene	98-82-8	120.20	0.400	1.97	ND	ND		2	WG1180454
Methylene Chloride	75-09-2	84.90	0.400	1.39	0.533	1.85		2	WG1180454
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	2.83	11.6		2	WG1180454
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	30.9	91.2		2	WG1180454
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	13.9	57.0		2	WG1180454
Methyl methacrylate	80-62-6	100.12	0.400	1.64	2.51	10.3		2	WG1180454
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG1180454
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG1180454

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

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
2-Propanol	67-63-0	60.10	2.50	6.15	6.56	16.1		2	WG1180454
Propene	115-07-1	42.10	0.800	1.38	75.4	130		2	WG1180454
Styrene	100-42-5	104	0.400	1.70	0.634	2.70		2	WG1180454
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG1180454
Tetrachloroethylene	127-18-4	166	0.400	2.72	ND	ND		2	WG1180454
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	6.19	18.2		2	WG1180454
Toluene	108-88-3	92.10	0.400	1.51	9.14	34.4		2	WG1180454
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG1180454
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG1180454
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG1180454
Trichloroethylene	79-01-6	131	0.400	2.14	3.14	16.8		2	WG1180454
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	1.19	5.82		2	WG1180454
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	ND	ND		2	WG1180454
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	0.526	2.46		2	WG1180454
Vinyl chloride	75-01-4	62.50	0.400	1.02	0.768	1.96		2	WG1180454
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG1180454
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG1180454
m&p-Xylene	1330-20-7	106	0.800	3.47	6.31	27.4		2	WG1180454
o-Xylene	95-47-6	106	0.400	1.73	1.83	7.95		2	WG1180454
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*94.7*				WG1180454

Method Blank (MB)

(MB) R3351398-3 10/17/18 10:31

Analyte	MB Result ppmv	MB Qualifier	MB MDL ppmv	MB RDL ppmv
Methane	U		6.98	10.0
Ethane	U		3.86	10.0
Ethene	U		3.61	10.0

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

(LCS) R3351398-1 10/17/18 10:09 • (LCSD) R3351398-2 10/17/18 10:12

Analyte	Spike Amount ppmv	LCS Result ppmv	LCSD Result ppmv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	500	523	506	105	101	79.0-115			3.33	20
Ethane	500	519	511	104	102	85.0-115			1.53	20
Ethene	500	504	494	101	98.9	85.0-118			1.98	20

Method Blank (MB)

(MB) R3350322-3 10/13/18 10:09

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3350322-3 10/13/18 10:09

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
(S) 1,4-Bromofluorobenzene	*92.7*			*60.0-140*

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

(LCS) R3350322-1 10/13/18 08:38 • (LCSD) R3350322-2 10/13/18 09:23

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.27	3.30	87.1	88.0	55.0-148			1.00	25
Propene	3.75	3.67	3.71	97.8	98.9	64.0-144			1.11	25
Dichlorodifluoromethane	3.75	3.71	3.76	98.8	100	64.0-139			1.33	25
1,2-Dichlorotetrafluoroethane	3.75	3.72	3.78	99.2	101	70.0-130			1.55	25
Chloromethane	3.75	3.78	3.81	101	102	70.0-130			0.727	25

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

(LCS) R3350322-1 10/13/18 08:38 • (LCSD) R3350322-2 10/13/18 09:23

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Vinyl chloride	3.75	3.61	3.69	96.2	98.4	70.0-130			2.24	25
1,3-Butadiene	3.75	3.59	3.75	95.8	99.9	70.0-130			4.20	25
Bromomethane	3.75	3.59	3.04	95.8	81.0	70.0-130			16.8	25
Chloroethane	3.75	3.62	3.61	96.6	96.3	70.0-130			0.280	25
Trichlorofluoromethane	3.75	3.70	3.69	98.6	98.4	70.0-130			0.215	25
1,1,2-Trichlorotrifluoroethane	3.75	3.73	3.71	99.4	99.0	70.0-130			0.355	25
1,1-Dichloroethene	3.75	3.79	3.74	101	99.8	70.0-130			1.27	25
1,1-Dichloroethane	3.75	3.77	3.77	101	100	70.0-130			0.143	25
Acetone	3.75	3.80	3.80	101	101	70.0-130			0.0180	25
2-Propanol	3.75	3.95	3.92	105	105	70.0-139			0.592	25
Carbon disulfide	3.75	3.76	3.75	100	100	70.0-130			0.117	25
Methylene Chloride	3.75	3.60	3.55	96.0	94.6	70.0-130			1.46	25
MTBE	3.75	3.82	3.81	102	102	70.0-130			0.185	25
trans-1,2-Dichloroethene	3.75	3.82	3.80	102	101	70.0-130			0.500	25
n-Hexane	3.75	3.81	3.78	102	101	70.0-130			0.755	25
Vinyl acetate	3.75	4.03	4.01	107	107	70.0-130			0.495	25
Methyl Ethyl Ketone	3.75	3.87	3.94	103	105	70.0-130			1.67	25
cis-1,2-Dichloroethene	3.75	3.88	3.87	104	103	70.0-130			0.359	25
Chloroform	3.75	3.76	3.76	100	100	70.0-130			0.165	25
Cyclohexane	3.75	3.84	3.82	102	102	70.0-130			0.372	25
1,1,1-Trichloroethane	3.75	3.76	3.77	100	101	70.0-130			0.443	25
Carbon tetrachloride	3.75	3.74	3.74	99.8	99.8	70.0-130			0.0894	25
Benzene	3.75	3.80	3.78	101	101	70.0-130			0.271	25
1,2-Dichloroethane	3.75	3.81	3.81	102	102	70.0-130			0.0712	25
Heptane	3.75	3.95	3.86	105	103	70.0-130			2.18	25
Trichloroethylene	3.75	3.80	3.81	101	102	70.0-130			0.150	25
1,2-Dichloropropane	3.75	3.81	3.80	102	101	70.0-130			0.320	25
1,4-Dioxane	3.75	3.81	3.81	101	102	70.0-140			0.252	25
Bromodichloromethane	3.75	3.80	3.81	101	102	70.0-130			0.253	25
cis-1,3-Dichloropropene	3.75	3.94	3.92	105	105	70.0-130			0.332	25
4-Methyl-2-pentanone (MIBK)	3.75	4.06	4.04	108	108	70.0-139			0.356	25
Toluene	3.75	3.88	3.86	103	103	70.0-130			0.475	25
trans-1,3-Dichloropropene	3.75	3.99	4.00	106	107	70.0-130			0.235	25
1,1,2-Trichloroethane	3.75	3.76	3.76	100	100	70.0-130			0.187	25
Tetrachloroethylene	3.75	3.81	3.83	102	102	70.0-130			0.437	25
Methyl Butyl Ketone	3.75	4.25	4.20	113	112	70.0-149			1.35	25
Dibromochloromethane	3.75	3.92	3.95	104	105	70.0-130			0.848	25
1,2-Dibromoethane	3.75	3.96	3.96	106	106	70.0-130			0.0217	25
Chlorobenzene	3.75	3.93	3.93	105	105	70.0-130			0.0787	25
Ethylbenzene	3.75	3.81	3.82	102	102	70.0-130			0.208	25

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

(LCS) R3350322-1 10/13/18 08:38 • (LCSD) R3350322-2 10/13/18 09:23

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
m&p-Xylene	7.50	7.57	7.56	101	101	70.0-130			0.144	25
o-Xylene	3.75	3.82	3.83	102	102	70.0-130			0.165	25
Styrene	3.75	3.94	3.97	105	106	70.0-130			0.700	25
Bromoform	3.75	3.84	3.89	102	104	70.0-130			1.21	25
1,1,2,2-Tetrachloroethane	3.75	3.78	3.80	101	101	70.0-130			0.472	25
4-Ethyltoluene	3.75	3.87	3.88	103	103	70.0-130			0.323	25
1,3,5-Trimethylbenzene	3.75	3.88	3.89	104	104	70.0-130			0.123	25
1,2,4-Trimethylbenzene	3.75	3.88	3.88	103	104	70.0-130			0.136	25
1,3-Dichlorobenzene	3.75	3.83	3.85	102	103	70.0-130			0.336	25
1,4-Dichlorobenzene	3.75	3.92	3.92	104	104	70.0-130			0.00202	25
Benzyl Chloride	3.75	4.01	4.03	107	107	70.0-152			0.452	25
1,2-Dichlorobenzene	3.75	3.79	3.79	101	101	70.0-130			0.0102	25
1,2,4-Trichlorobenzene	3.75	3.92	4.00	104	107	70.0-160			2.11	25
Hexachloro-1,3-butadiene	3.75	3.74	3.83	99.8	102	70.0-151			2.23	25
Naphthalene	3.75	3.93	3.97	105	106	70.0-159			0.969	25
Allyl Chloride	3.75	3.88	3.81	103	102	70.0-130			1.82	25
2-Chlorotoluene	3.75	3.84	3.85	102	103	70.0-130			0.0775	25
Methyl Methacrylate	3.75	3.96	3.94	106	105	70.0-130			0.396	25
Tetrahydrofuran	3.75	3.90	3.90	104	104	70.0-137			0.215	25
2,2,4-Trimethylpentane	3.75	3.86	3.84	103	102	70.0-130			0.383	25
Vinyl Bromide	3.75	3.67	3.66	97.9	97.6	70.0-130			0.358	25
Isopropylbenzene	3.75	3.83	3.84	102	102	70.0-130			0.297	25
(S) 1,4-Bromofluorobenzene				*97.0*	*97.0*	*60.0-140*				

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

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

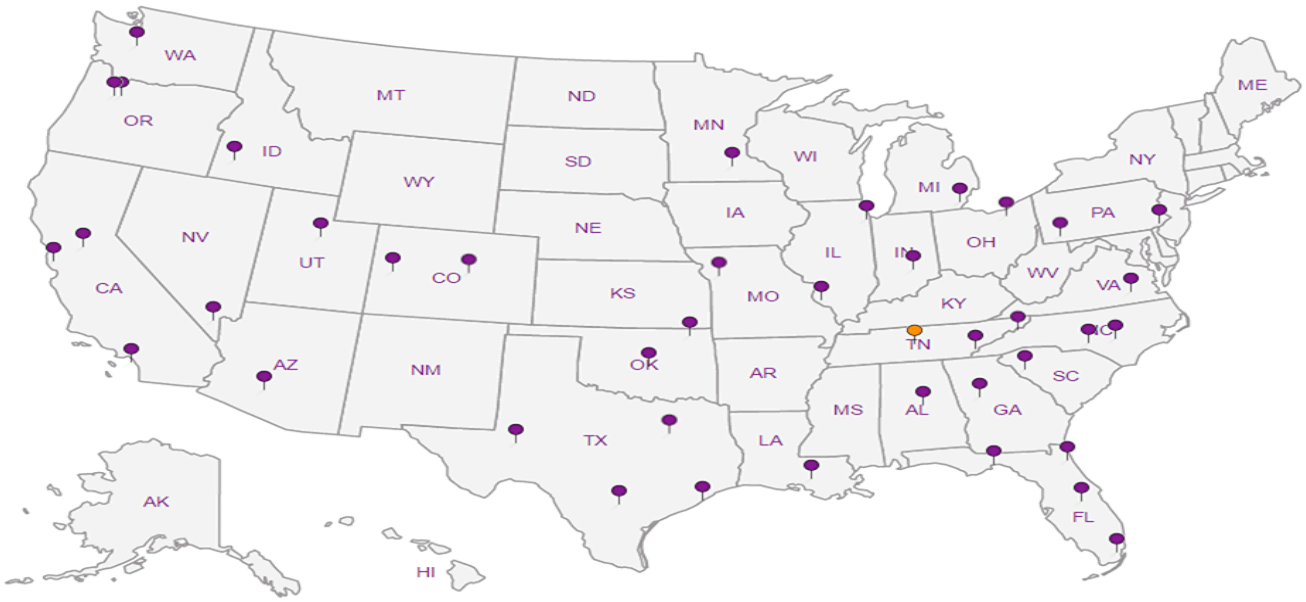
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address:
Terracon - Fort Collins
1831 Lefthand Circle, Suite C
Longmont, CO 80501

Billing Information: SAME

Analysis

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Mike Skridulis
Email To: mike.skridulis@terracon.com
Project Description: Future Knight O&G Well Site
City/State Collected: Longmont, CO
Phone: 303-454-5249
Fax:
Client Project # 22187033
Lab Project #
L# 103458
Collected by (print): M. Skridulis
Site/Facility ID #
P.O. #
T: M050
Collected by (signature):
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed: STANDARD
Email? ___No X Yes
FAX? X No ___Yes
Canister Pressure/Vacuum
Acctnum: TERRALCO
Template:
Prelogin:
TSR: Daphne Richards
PB:
Shipped Via:

Sample ID	Sample Description	Can #	Date	Time	Initial	Final	VOCs, Methane, Ethane, Ethylene - TO-15				Rem./Contaminant	Sample # (lab only)
SVP-01	Soil Vapor	7627	10/5/18	1030	21	8	X					01

Remarks: Fedex: 4094 8307 3847

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]	10/9/18	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____
Temp: Amb °C Bottles Received: 1
Date: 10/12/18 Time: 0845

Hold #
Condition: (lab use only) OK
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client:	TERRACON	SDG#	L34258
Cooler Received/Opened On: 10/ 12/18	Temperature:	Amb	
Received By: Eric Struck			
Signature: Eric Struck			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 12, 2018

Terracon Consultants, Inc - Longmont, CO

Sample Delivery Group:	L1039712
Samples Received:	10/31/2018
Project Number:	22187033
Description:	Future Knight O&G Well Site

Report To: Michael Skridulis
1242 Bramwood Place
Longmont, CO 80501

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-01 L1039712-01 GW

Collected by	Collected date/time	Received date/time
Charles Covington	10/29/18 14:20	10/31/18 08:45

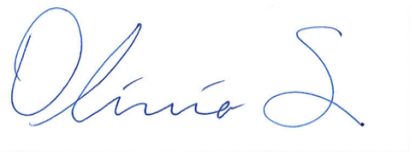
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1190246	1	11/02/18 14:22	11/06/18 10:06	TRB
Gravimetric Analysis by Method 2540 C-2011	WG1190982	1	11/05/18 14:19	11/05/18 14:56	AJS
Wet Chemistry by Method 4500CO2 D-2011	WG1191542	1	11/05/18 21:28	11/05/18 21:28	GB
Wet Chemistry by Method 7196A	WG1189826	1	11/01/18 12:30	11/01/18 12:30	EEM
Wet Chemistry by Method 9056A	WG1189584	20	11/02/18 01:22	11/02/18 01:22	ELN
Wet Chemistry by Method 9056A	WG1194116	1000	11/09/18 14:24	11/09/18 14:24	ELN
Mercury by Method 7470A	WG1190188	1	11/02/18 10:15	11/04/18 13:47	TCT
Metals (ICP) by Method 6010B	WG1190246	5	11/02/18 14:22	11/06/18 10:06	TRB
Metals (ICP) by Method 6010B	WG1190863	1	11/03/18 15:06	11/05/18 13:12	ST
Metals (ICP) by Method 6010B	WG1190863	5	11/03/18 15:06	11/05/18 22:32	ST
Volatile Organic Compounds (GC) by Method RSK175	WG1189954	1	11/02/18 13:31	11/02/18 13:31	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1189437	1	11/01/18 00:11	11/01/18 00:11	TJJ
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1191535	1	11/05/18 14:09	11/05/18 22:40	CJR

MW-02 L1039712-02 GW

Collected by	Collected date/time	Received date/time
Charles Covington	10/29/18 13:35	10/31/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1190246	1	11/02/18 14:22	11/06/18 01:21	TRB
Gravimetric Analysis by Method 2540 C-2011	WG1190982	1	11/05/18 14:19	11/05/18 14:56	AJS
Wet Chemistry by Method 4500CO2 D-2011	WG1191542	1	11/05/18 21:35	11/05/18 21:35	GB
Wet Chemistry by Method 7196A	WG1189826	1	11/01/18 12:31	11/01/18 12:31	EEM
Wet Chemistry by Method 9056A	WG1189584	20	11/02/18 01:38	11/02/18 01:38	ELN
Wet Chemistry by Method 9056A	WG1194116	500	11/09/18 14:05	11/09/18 14:05	ELN
Mercury by Method 7470A	WG1190188	1	11/02/18 10:15	11/04/18 13:59	TCT
Metals (ICP) by Method 6010B	WG1190246	1	11/02/18 14:22	11/06/18 01:21	TRB
Metals (ICP) by Method 6010B	WG1190863	1	11/03/18 15:06	11/05/18 13:15	ST
Metals (ICP) by Method 6010B	WG1190863	5	11/03/18 15:06	11/05/18 22:35	ST
Volatile Organic Compounds (GC) by Method RSK175	WG1189954	1	11/02/18 13:34	11/02/18 13:34	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1189437	1	11/01/18 00:31	11/01/18 00:31	TJJ
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1191535	1	11/05/18 14:09	11/05/18 23:02	CJR

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



Olivia Studebaker
Project Manager

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chromium,Trivalent	0.0657		0.0100	1	11/06/2018 10:06	WG1190246

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	58500		500	1	11/05/2018 14:56	WG1190982

Wet Chemistry by Method 4500CO2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Free Carbon Dioxide	60.9		20.0	1	11/05/2018 21:28	WG1191542

Sample Narrative:

L1039712-01 WG1191542: Endpoint pH 4.5 headspace

Wet Chemistry by Method 7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chromium,Hexavalent	ND	T8	0.0100	1	11/01/2018 12:30	WG1189826

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	1270		20.0	20	11/02/2018 01:22	WG1189584
Sulfate	61500		5000	1000	11/09/2018 14:24	WG1194116

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	11/04/2018 13:47	WG1190188

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic,Dissolved	0.0108		0.0100	1	11/05/2018 13:12	WG1190863
Barium,Dissolved	0.0945		0.00500	1	11/05/2018 13:12	WG1190863
Boron,Dissolved	0.432		0.200	1	11/05/2018 13:12	WG1190863
Cadmium,Dissolved	ND		0.00200	1	11/05/2018 13:12	WG1190863
Chromium	0.0657		0.0500	5	11/06/2018 10:06	WG1190246
Chromium,Dissolved	ND		0.0100	1	11/05/2018 13:12	WG1190863
Copper,Dissolved	ND		0.0100	1	11/05/2018 13:12	WG1190863
Lead,Dissolved	ND		0.0250	5	11/05/2018 22:32	WG1190863
Nickel,Dissolved	ND		0.0500	5	11/05/2018 22:32	WG1190863
Selenium,Dissolved	2.29		0.0100	1	11/05/2018 13:12	WG1190863
Silver,Dissolved	ND		0.00500	1	11/05/2018 13:12	WG1190863
Zinc,Dissolved	ND		0.0500	1	11/05/2018 13:12	WG1190863

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Methane	ND		0.0100	1	11/02/2018 13:31	WG1189954
Ethane	ND		0.0130	1	11/02/2018 13:31	WG1189954

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethene	ND		0.0130	1	11/02/2018 13:31	WG1189954

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/01/2018 00:11	WG1189437
Acrolein	ND		0.0500	1	11/01/2018 00:11	WG1189437
Acrylonitrile	ND		0.0100	1	11/01/2018 00:11	WG1189437
Benzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Bromobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Bromodichloromethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Bromoform	ND		0.00100	1	11/01/2018 00:11	WG1189437
Bromomethane	ND		0.00500	1	11/01/2018 00:11	WG1189437
n-Butylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
sec-Butylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
tert-Butylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Carbon tetrachloride	ND		0.00100	1	11/01/2018 00:11	WG1189437
Chlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Chlorodibromomethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Chloroethane	ND		0.00500	1	11/01/2018 00:11	WG1189437
Chloroform	ND		0.00500	1	11/01/2018 00:11	WG1189437
Chloromethane	ND		0.00250	1	11/01/2018 00:11	WG1189437
2-Chlorotoluene	ND		0.00100	1	11/01/2018 00:11	WG1189437
4-Chlorotoluene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/01/2018 00:11	WG1189437
1,2-Dibromoethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Dibromomethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,3-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,4-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Dichlorodifluoromethane	ND		0.00500	1	11/01/2018 00:11	WG1189437
1,1-Dichloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2-Dichloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1-Dichloroethene	ND		0.00100	1	11/01/2018 00:11	WG1189437
cis-1,2-Dichloroethene	ND		0.00100	1	11/01/2018 00:11	WG1189437
trans-1,2-Dichloroethene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2-Dichloropropane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1-Dichloropropene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,3-Dichloropropane	ND		0.00100	1	11/01/2018 00:11	WG1189437
cis-1,3-Dichloropropene	ND		0.00100	1	11/01/2018 00:11	WG1189437
trans-1,3-Dichloropropene	ND		0.00100	1	11/01/2018 00:11	WG1189437
2,2-Dichloropropane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Di-isopropyl ether	ND		0.00100	1	11/01/2018 00:11	WG1189437
Ethylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Hexachloro-1,3-butadiene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Isopropylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
p-Isopropyltoluene	ND		0.00100	1	11/01/2018 00:11	WG1189437
2-Butanone (MEK)	ND		0.0100	1	11/01/2018 00:11	WG1189437
Methylene Chloride	ND		0.00500	1	11/01/2018 00:11	WG1189437
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/01/2018 00:11	WG1189437
Methyl tert-butyl ether	ND		0.00100	1	11/01/2018 00:11	WG1189437
Naphthalene	ND		0.00500	1	11/01/2018 00:11	WG1189437
n-Propylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Styrene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437

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

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Tetrachloroethene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Toluene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2,3-Trichlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2,4-Trichlorobenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1,1-Trichloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,1,2-Trichloroethane	ND		0.00100	1	11/01/2018 00:11	WG1189437
Trichloroethene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Trichlorofluoromethane	ND		0.00500	1	11/01/2018 00:11	WG1189437
1,2,3-Trichloropropane	ND		0.00250	1	11/01/2018 00:11	WG1189437
1,2,4-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,2,3-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
1,3,5-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:11	WG1189437
Vinyl chloride	ND		0.00100	1	11/01/2018 00:11	WG1189437
Xylenes, Total	ND		0.00300	1	11/01/2018 00:11	WG1189437
(S) Toluene-d8	*103*		*80.0-120*		*11/01/2018 00:11*	WG1189437
(S) Dibromofluoromethane	*93.3*		*75.0-120*		*11/01/2018 00:11*	WG1189437
(S) 4-Bromofluorobenzene	*101*		*77.0-126*		*11/01/2018 00:11*	WG1189437

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Acenaphthene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Acenaphthylene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Benzo(a)anthracene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Benzo(a)pyrene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Benzo(b)fluoranthene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Benzo(g,h,i)perylene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Benzo(k)fluoranthene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Chrysene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Dibenz(a,h)anthracene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Fluoranthene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Fluorene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Naphthalene	ND		0.000250	1	11/05/2018 22:40	WG1191535
Phenanthrene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
Pyrene	ND		0.0000500	1	11/05/2018 22:40	WG1191535
1-Methylnaphthalene	ND		0.000250	1	11/05/2018 22:40	WG1191535
2-Methylnaphthalene	ND		0.000250	1	11/05/2018 22:40	WG1191535
2-Chloronaphthalene	ND		0.000250	1	11/05/2018 22:40	WG1191535
(S) Nitrobenzene-d5	*129*		*31.0-160*		*11/05/2018 22:40*	WG1191535
(S) 2-Fluorobiphenyl	*102*		*48.0-148*		*11/05/2018 22:40*	WG1191535
(S) p-Terphenyl-d14	*87.9*		*37.0-146*		*11/05/2018 22:40*	WG1191535

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Trivalent	0.0121		0.0100	1	11/06/2018 01:21	WG1190246

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	30600	J3	400	1	11/05/2018 14:56	WG1190982

Wet Chemistry by Method 4500CO2 D-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Free Carbon Dioxide	78.9		20.0	1	11/05/2018 21:35	WG1191542

Sample Narrative:

L1039712-02 WG1191542: Endpoint pH 4.5 headspace

Wet Chemistry by Method 7196A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND	T8	0.0100	1	11/01/2018 12:31	WG1189826

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	555		20.0	20	11/02/2018 01:38	WG1189584
Sulfate	35800		2500	500	11/09/2018 14:05	WG1194116

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury,Dissolved	ND		0.000200	1	11/04/2018 13:59	WG1190188

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/05/2018 13:15	WG1190863
Barium,Dissolved	0.0528		0.00500	1	11/05/2018 13:15	WG1190863
Boron,Dissolved	0.433		0.200	1	11/05/2018 13:15	WG1190863
Cadmium,Dissolved	ND		0.00200	1	11/05/2018 13:15	WG1190863
Chromium	0.0121		0.0100	1	11/06/2018 01:21	WG1190246
Chromium,Dissolved	ND		0.0100	1	11/05/2018 13:15	WG1190863
Copper,Dissolved	0.0101		0.0100	1	11/05/2018 13:15	WG1190863
Lead,Dissolved	ND		0.0250	5	11/05/2018 22:35	WG1190863
Nickel,Dissolved	ND		0.0500	5	11/05/2018 22:35	WG1190863
Selenium,Dissolved	1.17		0.0100	1	11/05/2018 13:15	WG1190863
Silver,Dissolved	ND		0.00500	1	11/05/2018 13:15	WG1190863
Zinc,Dissolved	ND		0.0500	1	11/05/2018 13:15	WG1190863

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/02/2018 13:34	WG1189954
Ethane	ND		0.0130	1	11/02/2018 13:34	WG1189954

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethene	ND		0.0130	1	11/02/2018 13:34	WG1189954

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/01/2018 00:31	WG1189437
Acrolein	ND		0.0500	1	11/01/2018 00:31	WG1189437
Acrylonitrile	ND		0.0100	1	11/01/2018 00:31	WG1189437
Benzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Bromobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Bromodichloromethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Bromoform	ND		0.00100	1	11/01/2018 00:31	WG1189437
Bromomethane	ND		0.00500	1	11/01/2018 00:31	WG1189437
n-Butylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
sec-Butylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
tert-Butylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Carbon tetrachloride	ND		0.00100	1	11/01/2018 00:31	WG1189437
Chlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Chlorodibromomethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Chloroethane	ND		0.00500	1	11/01/2018 00:31	WG1189437
Chloroform	ND		0.00500	1	11/01/2018 00:31	WG1189437
Chloromethane	ND		0.00250	1	11/01/2018 00:31	WG1189437
2-Chlorotoluene	ND		0.00100	1	11/01/2018 00:31	WG1189437
4-Chlorotoluene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/01/2018 00:31	WG1189437
1,2-Dibromoethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Dibromomethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,3-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,4-Dichlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Dichlorodifluoromethane	ND		0.00500	1	11/01/2018 00:31	WG1189437
1,1-Dichloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2-Dichloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1-Dichloroethene	ND		0.00100	1	11/01/2018 00:31	WG1189437
cis-1,2-Dichloroethene	ND		0.00100	1	11/01/2018 00:31	WG1189437
trans-1,2-Dichloroethene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2-Dichloropropane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1-Dichloropropene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,3-Dichloropropane	ND		0.00100	1	11/01/2018 00:31	WG1189437
cis-1,3-Dichloropropene	ND		0.00100	1	11/01/2018 00:31	WG1189437
trans-1,3-Dichloropropene	ND		0.00100	1	11/01/2018 00:31	WG1189437
2,2-Dichloropropane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Di-isopropyl ether	ND		0.00100	1	11/01/2018 00:31	WG1189437
Ethylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Hexachloro-1,3-butadiene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Isopropylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
p-Isopropyltoluene	ND		0.00100	1	11/01/2018 00:31	WG1189437
2-Butanone (MEK)	ND		0.0100	1	11/01/2018 00:31	WG1189437
Methylene Chloride	ND		0.00500	1	11/01/2018 00:31	WG1189437
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/01/2018 00:31	WG1189437
Methyl tert-butyl ether	ND		0.00100	1	11/01/2018 00:31	WG1189437
Naphthalene	ND		0.00500	1	11/01/2018 00:31	WG1189437
n-Propylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Styrene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437

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

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Tetrachloroethene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Toluene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2,3-Trichlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2,4-Trichlorobenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1,1-Trichloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,1,2-Trichloroethane	ND		0.00100	1	11/01/2018 00:31	WG1189437
Trichloroethene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Trichlorofluoromethane	ND		0.00500	1	11/01/2018 00:31	WG1189437
1,2,3-Trichloropropane	ND		0.00250	1	11/01/2018 00:31	WG1189437
1,2,4-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,2,3-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
1,3,5-Trimethylbenzene	ND		0.00100	1	11/01/2018 00:31	WG1189437
Vinyl chloride	ND		0.00100	1	11/01/2018 00:31	WG1189437
Xylenes, Total	ND		0.00300	1	11/01/2018 00:31	WG1189437
(S) Toluene-d8	*103*		*80.0-120*		*11/01/2018 00:31*	WG1189437
(S) Dibromofluoromethane	*92.8*		*75.0-120*		*11/01/2018 00:31*	WG1189437
(S) 4-Bromofluorobenzene	*97.7*		*77.0-126*		*11/01/2018 00:31*	WG1189437

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Acenaphthene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Acenaphthylene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Benzo(a)anthracene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Benzo(a)pyrene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Benzo(b)fluoranthene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Benzo(g,h,i)perylene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Benzo(k)fluoranthene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Chrysene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Dibenz(a,h)anthracene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Fluoranthene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Fluorene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Naphthalene	0.000296	B	0.000250	1	11/05/2018 23:02	WG1191535
Phenanthrene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
Pyrene	ND		0.0000500	1	11/05/2018 23:02	WG1191535
1-Methylnaphthalene	ND		0.000250	1	11/05/2018 23:02	WG1191535
2-Methylnaphthalene	ND		0.000250	1	11/05/2018 23:02	WG1191535
2-Chloronaphthalene	ND		0.000250	1	11/05/2018 23:02	WG1191535
(S) Nitrobenzene-d5	*128*		*31.0-160*		*11/05/2018 23:02*	WG1191535
(S) 2-Fluorobiphenyl	*102*		*48.0-148*		*11/05/2018 23:02*	WG1191535
(S) p-Terphenyl-d14	*102*		*37.0-146*		*11/05/2018 23:02*	WG1191535

Method Blank (MB)

(MB) R3357791-1 11/05/18 14:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1039712-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1039712-02 11/05/18 14:56 • (DUP) R3357791-3 11/05/18 14:56

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	30600	39300	1	24.7	J3	5

Laboratory Control Sample (LCS)

(LCS) R3357791-2 11/05/18 14:56

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Dissolved Solids	8800	8580	97.5	85.0-115	

Method Blank (MB)

(MB) R3357351-2 11/05/18 19:27

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Free Carbon Dioxide	U		6.67	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1039529-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039529-01 11/05/18 19:34 • (DUP) R3357351-4 11/05/18 19:40

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Free Carbon Dioxide	92.1	85.0	1	8.07		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1039529-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1039529-07 11/05/18 22:31 • (DUP) R3357351-7 11/05/18 22:38

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Free Carbon Dioxide	223	205	1	8.16		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

Method Blank (MB)

(MB) R3355967-1 11/01/18 12:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chromium,Hexavalent	U		0.00300	0.0100

L1039960-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039960-01 11/01/18 12:15 • (DUP) R3355967-5 11/01/18 12:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3355967-2 11/01/18 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	0.600	0.602	100	80.0-120	

L1039897-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039897-01 11/01/18 12:14 • (MS) R3355967-3 11/01/18 12:14 • (MSD) R3355967-4 11/01/18 12:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	0.500	ND	0.479	0.488	95.8	97.6	1	85.0-115			1.86	20

Method Blank (MB)

(MB) R3356324-1 11/01/18 16:27

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.0519	1.00

L1039353-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1039353-02 11/01/18 22:17 • (DUP) R3356324-3 11/01/18 22:32

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	19.2	19.1	1	0.523		15

L1039926-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039926-01 11/02/18 15:29 • (DUP) R3356466-1 11/02/18 15:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8.89	8.91	1	0.266		15

Laboratory Control Sample (LCS)

(LCS) R3356324-2 11/01/18 16:42

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.1	100	80.0-120	

L1039353-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039353-02 11/01/18 22:17 • (MS) R3356324-4 11/01/18 22:48 • (MSD) R3356324-5 11/01/18 23:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	19.2	67.4	71.0	96.4	104	1	80.0-120			5.11	15

L1039926-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1039926-01 11/02/18 15:29 • (MS) R3356466-2 11/02/18 16:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	8.89	58.8	99.7	1	80.0-120	

Method Blank (MB)

(MB) R3358585-1 11/09/18 12:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sulfate	U		0.0774	5.00

Laboratory Control Sample (LCS)

(LCS) R3358585-2 11/09/18 13:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40.0	39.4	98.5	80.0-120	

Method Blank (MB)

(MB) R3356757-1 11/04/18 13:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000490	0.000200

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

(LCS) R3356757-2 11/04/18 13:42 • (LCSD) R3356757-3 11/04/18 13:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	0.00287	0.00286	95.7	95.2	80.0-120			0.510	20

L1039712-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039712-01 11/04/18 13:47 • (MS) R3356757-4 11/04/18 13:49 • (MSD) R3356757-5 11/04/18 13:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00315	0.00306	105	102	1	75.0-125			2.86	20

Method Blank (MB)

(MB) R3357141-1 11/06/18 00:59

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chromium	U		0.00140	0.0100

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

(LCS) R3357141-2 11/06/18 01:02 • (LCSD) R3357141-3 11/06/18 01:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chromium	1.00	1.04	1.02	104	102	80.0-120			2.01	20

L1040231-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040231-05 11/06/18 01:07 • (MS) R3357141-5 11/06/18 01:12 • (MSD) R3357141-6 11/06/18 01:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium	1.00	ND	1.02	1.01	102	101	1	75.0-125			0.867	20

Method Blank (MB)

(MB) R3357093-1 11/05/18 12:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic,Dissolved	U		0.00650	0.0100
Barium,Dissolved	U		0.00170	0.00500
Boron,Dissolved	U		0.0126	0.200
Cadmium,Dissolved	U		0.000700	0.00200
Chromium,Dissolved	U		0.00140	0.0100
Copper,Dissolved	U		0.00530	0.0100
Lead,Dissolved	U		0.00190	0.00500
Nickel,Dissolved	U		0.00490	0.0100
Selenium,Dissolved	U		0.00740	0.0100
Silver,Dissolved	U		0.00280	0.00500
Zinc,Dissolved	0.00943	J	0.00590	0.0500

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

(LCS) R3357093-2 11/05/18 12:56 • (LCSD) R3357093-3 11/05/18 12:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	1.02	1.01	102	101	80.0-120			1.08	20
Barium,Dissolved	1.00	1.09	1.08	109	108	80.0-120			1.03	20
Boron,Dissolved	1.00	1.04	1.04	104	104	80.0-120			0.151	20
Cadmium,Dissolved	1.00	0.998	0.989	99.8	98.9	80.0-120			0.949	20
Chromium,Dissolved	1.00	1.00	0.986	100	98.6	80.0-120			1.44	20
Copper,Dissolved	1.00	1.02	1.01	102	101	80.0-120			1.34	20
Lead,Dissolved	1.00	1.06	1.05	106	105	80.0-120			1.17	20
Nickel,Dissolved	1.00	1.05	1.04	105	104	80.0-120			1.15	20
Selenium,Dissolved	1.00	0.996	0.985	99.6	98.5	80.0-120			1.15	20
Silver,Dissolved	0.200	0.187	0.185	93.4	92.4	80.0-120			1.14	20
Zinc,Dissolved	1.00	1.02	1.01	102	101	80.0-120			1.07	20

L1040218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040218-01 11/05/18 13:02 • (MS) R3357093-5 11/05/18 13:07 • (MSD) R3357093-6 11/05/18 13:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	0.0103	1.06	1.04	105	103	1	75.0-125			2.11	20
Barium,Dissolved	1.00	0.709	1.77	1.75	106	104	1	75.0-125			1.32	20
Boron,Dissolved	1.00	ND	1.09	1.08	104	104	1	75.0-125			0.767	20
Cadmium,Dissolved	1.00	ND	1.02	0.999	102	99.9	1	75.0-125			2.05	20
Chromium,Dissolved	1.00	ND	1.00	0.976	100	97.6	1	75.0-125			2.61	20

L1040218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040218-01 11/05/18 13:02 • (MS) R3357093-5 11/05/18 13:07 • (MSD) R3357093-6 11/05/18 13:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper,Dissolved	1.00	ND	1.04	1.02	104	102	1	75.0-125			2.21	20
Lead,Dissolved	1.00	0.00740	1.07	1.05	106	104	1	75.0-125			2.18	20
Nickel,Dissolved	1.00	ND	1.05	1.03	105	103	1	75.0-125			1.94	20
Selenium,Dissolved	1.00	ND	1.03	1.02	103	102	1	75.0-125			1.63	20
Silver,Dissolved	0.200	ND	0.191	0.186	95.3	93.2	1	75.0-125			2.23	20
Zinc,Dissolved	1.00	ND	1.02	0.997	101	98.4	1	75.0-125			2.10	20

Method Blank (MB)

(MB) R3356308-1 11/02/18 11:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130

L1039924-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039924-01 11/02/18 11:22 • (DUP) R3356308-2 11/02/18 12:00

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	0.114	0.114	1	0.358		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20

L1039926-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039926-01 11/02/18 11:24 • (DUP) R3356308-3 11/02/18 12:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	0.142	0.140	1	1.40		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20

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

(LCS) R3356308-4 11/02/18 13:52 • (LCSD) R3356308-5 11/02/18 13:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0756	0.0740	112	109	85.0-115			2.23	20
Ethane	0.129	0.114	0.114	88.1	88.3	85.0-115			0.219	20
Ethene	0.127	0.113	0.113	89.0	89.2	85.0-115			0.240	20

Method Blank (MB)

(MB) R3355957-4 10/31/18 21:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	0.0500
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00100
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100

Method Blank (MB)

(MB) R3355957-4 10/31/18 21:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000412	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*102*			*80.0-120*
(S) Dibromofluoromethane	*93.8*			*75.0-120*
(S) 4-Bromofluorobenzene	*96.1*			*77.0-126*

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

(LCS) R3355957-1 10/31/18 19:57 • (LCSD) R3355957-2 10/31/18 20:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0735	0.0704	58.8	56.3	19.0-160			4.37	27
Acrolein	0.125	0.113	0.111	90.4	89.1	10.0-160			1.48	26
Acrylonitrile	0.125	0.0950	0.0921	76.0	73.7	55.0-149			3.04	20
Benzene	0.0250	0.0230	0.0220	92.0	88.1	70.0-123			4.24	20

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

(LCS) R3355957-1 10/31/18 19:57 • (LCSD) R3355957-2 10/31/18 20:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromobenzene	0.0250	0.0246	0.0232	98.3	92.8	73.0-121			5.72	20
Bromodichloromethane	0.0250	0.0232	0.0217	92.6	87.0	75.0-120			6.25	20
Bromoform	0.0250	0.0284	0.0279	114	112	68.0-132			1.70	20
Bromomethane	0.0250	0.0230	0.0196	91.9	78.3	10.0-160			16.0	25
n-Butylbenzene	0.0250	0.0204	0.0189	81.6	75.6	73.0-125			7.64	20
sec-Butylbenzene	0.0250	0.0239	0.0217	95.8	86.9	75.0-125			9.73	20
tert-Butylbenzene	0.0250	0.0257	0.0235	103	93.9	76.0-124			9.03	20
Carbon tetrachloride	0.0250	0.0235	0.0218	94.0	87.2	68.0-126			7.56	20
Chlorobenzene	0.0250	0.0268	0.0248	107	99.2	80.0-121			7.69	20
Chlorodibromomethane	0.0250	0.0265	0.0248	106	99.0	77.0-125			6.81	20
Chloroethane	0.0250	0.0210	0.0186	83.9	74.4	47.0-150			11.9	20
Chloroform	0.0250	0.0229	0.0218	91.6	87.4	73.0-120			4.77	20
Chloromethane	0.0250	0.0167	0.0153	67.0	61.1	41.0-142			9.24	20
2-Chlorotoluene	0.0250	0.0256	0.0242	103	96.7	76.0-123			5.83	20
4-Chlorotoluene	0.0250	0.0253	0.0237	101	94.9	75.0-122			6.20	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0202	0.0203	81.0	81.3	58.0-134			0.457	20
1,2-Dibromoethane	0.0250	0.0252	0.0239	101	95.6	80.0-122			5.47	20
Dibromomethane	0.0250	0.0235	0.0220	94.0	88.1	80.0-120			6.48	20
1,2-Dichlorobenzene	0.0250	0.0232	0.0222	92.9	88.8	79.0-121			4.60	20
1,3-Dichlorobenzene	0.0250	0.0248	0.0236	99.1	94.3	79.0-120			4.94	20
1,4-Dichlorobenzene	0.0250	0.0242	0.0227	96.9	90.7	79.0-120			6.57	20
Dichlorodifluoromethane	0.0250	0.0187	0.0163	74.8	65.3	51.0-149			13.5	20
1,1-Dichloroethane	0.0250	0.0222	0.0212	89.0	84.8	70.0-126			4.83	20
1,2-Dichloroethane	0.0250	0.0199	0.0192	79.8	76.8	70.0-128			3.86	20
1,1-Dichloroethene	0.0250	0.0255	0.0246	102	98.2	71.0-124			3.77	20
cis-1,2-Dichloroethene	0.0250	0.0244	0.0235	97.8	93.8	73.0-120			4.14	20
trans-1,2-Dichloroethene	0.0250	0.0241	0.0226	96.2	90.3	73.0-120			6.34	20
1,2-Dichloropropane	0.0250	0.0236	0.0221	94.5	88.5	77.0-125			6.55	20
1,1-Dichloropropene	0.0250	0.0226	0.0215	90.4	85.9	74.0-126			5.07	20
1,3-Dichloropropane	0.0250	0.0244	0.0232	97.6	92.7	80.0-120			5.10	20
cis-1,3-Dichloropropene	0.0250	0.0255	0.0237	102	94.6	80.0-123			7.64	20
trans-1,3-Dichloropropene	0.0250	0.0249	0.0233	99.4	93.0	78.0-124			6.65	20
2,2-Dichloropropane	0.0250	0.0217	0.0200	86.6	80.1	58.0-130			7.79	20
Di-isopropyl ether	0.0250	0.0210	0.0199	83.9	79.8	58.0-138			5.11	20
Ethylbenzene	0.0250	0.0264	0.0244	106	97.5	79.0-123			7.95	20
Hexachloro-1,3-butadiene	0.0250	0.0218	0.0224	87.2	89.5	54.0-138			2.58	20
Isopropylbenzene	0.0250	0.0263	0.0243	105	97.2	76.0-127			8.01	20
p-Isopropyltoluene	0.0250	0.0239	0.0219	95.4	87.6	76.0-125			8.50	20
2-Butanone (MEK)	0.125	0.0834	0.0810	66.7	64.8	44.0-160			2.91	20
Methylene Chloride	0.0250	0.0236	0.0222	94.5	88.7	67.0-120			6.26	20

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

(LCS) R3355957-1 10/31/18 19:57 • (LCSD) R3355957-2 10/31/18 20:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	0.125	0.0995	0.0944	79.6	75.5	68.0-142			5.20	20
Methyl tert-butyl ether	0.0250	0.0222	0.0213	88.9	85.1	68.0-125			4.42	20
Naphthalene	0.0250	0.0184	0.0182	73.6	72.9	54.0-135			0.978	20
n-Propylbenzene	0.0250	0.0249	0.0230	99.5	91.9	77.0-124			7.97	20
Styrene	0.0250	0.0273	0.0257	109	103	73.0-130			5.90	20
1,1,1,2-Tetrachloroethane	0.0250	0.0281	0.0260	112	104	75.0-125			7.56	20
1,1,2,2-Tetrachloroethane	0.0250	0.0253	0.0247	101	99.0	65.0-130			2.38	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0260	0.0227	104	90.7	69.0-132			13.7	20
Tetrachloroethene	0.0250	0.0282	0.0252	113	101	72.0-132			11.3	20
Toluene	0.0250	0.0257	0.0239	103	95.5	79.0-120			7.48	20
1,2,3-Trichlorobenzene	0.0250	0.0203	0.0196	81.3	78.6	50.0-138			3.45	20
1,2,4-Trichlorobenzene	0.0250	0.0217	0.0208	86.7	83.1	57.0-137			4.18	20
1,1,1-Trichloroethane	0.0250	0.0233	0.0222	93.2	88.8	73.0-124			4.84	20
1,1,2-Trichloroethane	0.0250	0.0257	0.0239	103	95.8	80.0-120			7.02	20
Trichloroethene	0.0250	0.0258	0.0239	103	95.6	78.0-124			7.60	20
Trichlorofluoromethane	0.0250	0.0216	0.0197	86.5	78.9	59.0-147			9.17	20
1,2,3-Trichloropropane	0.0250	0.0248	0.0243	99.2	97.2	73.0-130			1.96	20
1,2,4-Trimethylbenzene	0.0250	0.0251	0.0236	101	94.3	76.0-121			6.37	20
1,2,3-Trimethylbenzene	0.0250	0.0232	0.0219	92.8	87.7	77.0-120			5.61	20
1,3,5-Trimethylbenzene	0.0250	0.0258	0.0238	103	95.3	76.0-122			7.95	20
Vinyl chloride	0.0250	0.0230	0.0194	92.0	77.6	67.0-131			17.0	20
Xylenes, Total	0.0750	0.0797	0.0721	106	96.1	79.0-123			10.0	20
(S) Toluene-d8				*101*	*99.5*	*80.0-120*				
(S) Dibromofluoromethane				*91.5*	*91.2*	*75.0-120*				
(S) 4-Bromofluorobenzene				*96.4*	*98.0*	*77.0-126*				

Method Blank (MB)

(MB) R3357205-3 11/05/18 22:18

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Anthracene	U		0.0000140	0.0000500
Acenaphthene	U		0.0000100	0.0000500
Acenaphthylene	U		0.0000120	0.0000500
Benzo(a)anthracene	U		0.00000410	0.0000500
Benzo(a)pyrene	U		0.0000116	0.0000500
Benzo(b)fluoranthene	0.00000305	J	0.00000212	0.0000500
Benzo(g,h,i)perylene	U		0.00000227	0.0000500
Benzo(k)fluoranthene	U		0.0000136	0.0000500
Chrysene	U		0.0000108	0.0000500
Dibenz(a,h)anthracene	U		0.00000396	0.0000500
Fluoranthene	U		0.0000157	0.0000500
Fluorene	U		0.00000850	0.0000500
Indeno(1,2,3-cd)pyrene	U		0.0000148	0.0000500
Naphthalene	0.0000317	J	0.0000198	0.000250
Phenanthrene	U		0.00000820	0.0000500
Pyrene	U		0.0000117	0.0000500
1-Methylnaphthalene	U		0.00000821	0.000250
2-Methylnaphthalene	U		0.00000902	0.000250
2-Chloronaphthalene	U		0.00000647	0.000250
(S) Nitrobenzene-d5	*132*			*31.0-160*
(S) 2-Fluorobiphenyl	*106*			*48.0-148*
(S) p-Terphenyl-d14	*114*			*37.0-146*

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

(LCS) R3357205-1 11/05/18 21:34 • (LCSD) R3357205-2 11/05/18 21:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.00200	0.00228	0.00216	114	108	67.0-150			5.41	20
Acenaphthene	0.00200	0.00214	0.00205	107	102	65.0-138			4.30	20
Acenaphthylene	0.00200	0.00226	0.00215	113	108	66.0-140			4.99	20
Benzo(a)anthracene	0.00200	0.00223	0.00217	111	108	61.0-140			2.73	20
Benzo(a)pyrene	0.00200	0.00226	0.00218	113	109	60.0-143			3.60	20
Benzo(b)fluoranthene	0.00200	0.00229	0.00218	114	109	58.0-141			4.92	20
Benzo(g,h,i)perylene	0.00200	0.00233	0.00223	117	111	52.0-153			4.39	20
Benzo(k)fluoranthene	0.00200	0.00217	0.00211	108	105	58.0-148			2.80	20
Chrysene	0.00200	0.00226	0.00220	113	110	64.0-144			2.69	20
Dibenz(a,h)anthracene	0.00200	0.00227	0.00216	114	108	52.0-155			4.97	20
Fluoranthene	0.00200	0.00236	0.00226	118	113	69.0-153			4.33	20

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

(LCS) R3357205-1 11/05/18 21:34 • (LCSD) R3357205-2 11/05/18 21:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.00200	0.00218	0.00207	109	103	64.0-136			5.18	20
Indeno(1,2,3-cd)pyrene	0.00200	0.00233	0.00221	117	111	54.0-153			5.29	20
Naphthalene	0.00200	0.00217	0.00205	108	102	61.0-137			5.69	20
Phenanthrene	0.00200	0.00220	0.00210	110	105	62.0-137			4.65	20
Pyrene	0.00200	0.00220	0.00214	110	107	60.0-142			2.76	20
1-Methylnaphthalene	0.00200	0.00225	0.00220	112	110	66.0-142			2.25	20
2-Methylnaphthalene	0.00200	0.00202	0.00199	101	99.5	62.0-136			1.50	20
2-Chloronaphthalene	0.00200	0.00216	0.00205	108	102	64.0-140			5.23	20
(S) Nitrobenzene-d5				*130*	*131*	*31.0-160*				
(S) 2-Fluorobiphenyl				*109*	*107*	*48.0-148*				
(S) p-Terphenyl-d14				*118*	*115*	*37.0-146*				

L1040148-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040148-06 11/06/18 03:02 • (MS) R3357205-4 11/06/18 03:24 • (MSD) R3357205-5 11/06/18 03:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.00190	0.000174	0.00223	0.00216	108	105	1	56.0-156			3.19	20
Acenaphthene	0.00190	U	0.00235	0.00237	124	125	1	44.0-153			0.847	20
Acenaphthylene	0.00190	U	0.00201	0.00210	106	111	1	53.0-150			4.38	20
Benzo(a)anthracene	0.00190	U	0.00212	0.00208	112	109	1	47.0-151			1.90	20
Benzo(a)pyrene	0.00190	0.0000361	0.00203	0.00200	105	103	1	45.0-146			1.49	20
Benzo(b)fluoranthene	0.00190	0.0000962	0.00211	0.00210	106	105	1	43.0-142			0.475	20
Benzo(g,h,i)perylene	0.00190	0.000159	0.00218	0.00215	106	105	1	40.0-147			1.39	20
Benzo(k)fluoranthene	0.00190	U	0.00200	0.00193	105	102	1	43.0-148			3.56	21
Chrysene	0.00190	U	0.00222	0.00215	117	113	1	50.0-148			3.20	20
Dibenz(a,h)anthracene	0.00190	U	0.00186	0.00178	97.9	93.7	1	37.0-151			4.40	20
Fluoranthene	0.00190	0.0000979	0.00220	0.00217	111	109	1	56.0-157			1.37	20
Fluorene	0.00190	0.00130	0.00319	0.00305	99.5	92.1	1	48.0-148			4.49	20
Indeno(1,2,3-cd)pyrene	0.00190	0.0000395	0.00194	0.00191	100	98.4	1	41.0-148			1.56	20
Naphthalene	0.00190	0.000153	0.00210	0.00210	102	102	1	10.0-160			0.000	20
Phenanthrene	0.00190	0.000289	0.00226	0.00223	104	102	1	47.0-147			1.34	20
Pyrene	0.00190	0.000153	0.00216	0.00209	106	102	1	51.0-148			3.29	20
1-Methylnaphthalene	0.00190	0.00248	0.00454	0.00453	108	108	1	21.0-160			0.221	20
2-Methylnaphthalene	0.00190	0.00153	0.00341	0.00343	98.9	100	1	31.0-160			0.585	20
2-Chloronaphthalene	0.00190	U	0.00160	0.00165	84.2	86.8	1	52.0-148			3.08	20
(S) Nitrobenzene-d5					*118*	*119*		*31.0-160*				
(S) 2-Fluorobiphenyl					*93.2*	*101*		*48.0-148*				
(S) p-Terphenyl-d14					*108*	*109*		*37.0-146*				

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

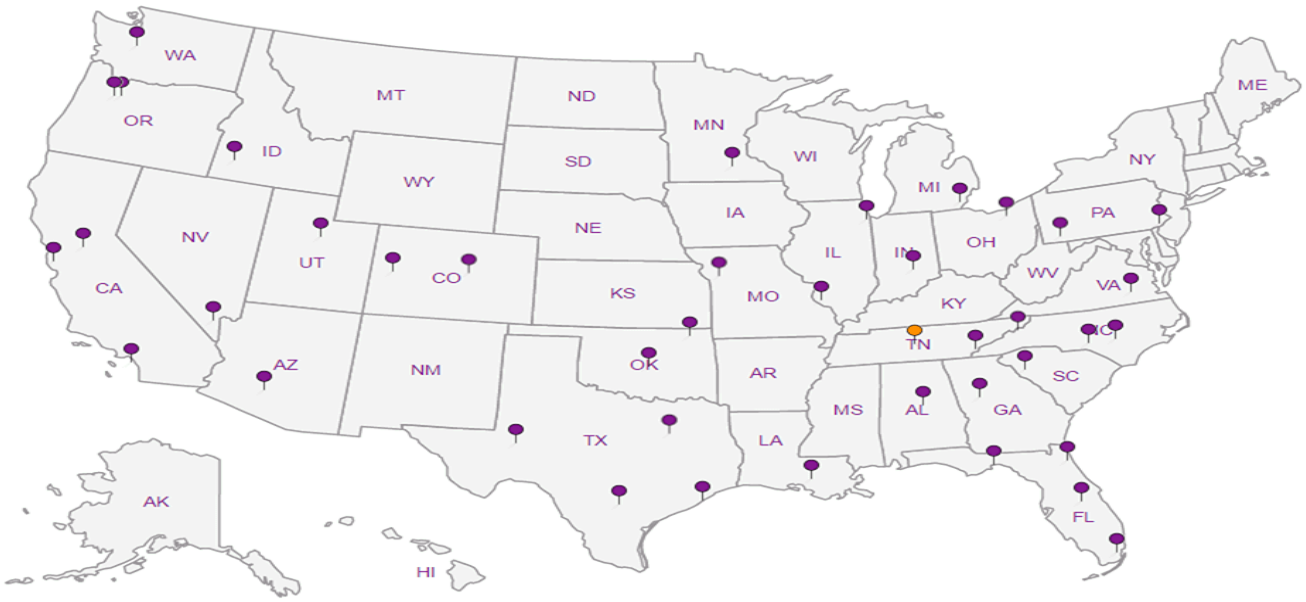
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Terracon - Longmont
12831 Lefthand Circle, Suite C
Longmont, CO 80501

Billing Information: **Same as Address**

Report to: Mike Skridulis

Email To: mike.skridulis@terracon.com

Project Description: **Future Knight O&G Well Site**

City/State Collected: Longmont, CO

Phone: **303-454-5249** Fax: **970-484-0454**

Client Project # **22187033**

Lab Project #

Collected by (print): Charles Covington

Site/Facility ID #

P.O. #

Collected by (signature): Chas A. Cov

Immediately Packed on Ice N___ Y___

Rush? (Lab MUST Be Notified)
___Same Day ___Five Day
___Next Day ___5 Day (Rad Only)
___Two Day ___10 Day (Rad Only)
___Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC8260 (2) 40ml Amber wHCl	Diss. Methane, Ethane, Ethylene (2) 40ml	CO2 - 125ml HDPE No Pres	Diss. Metals - 250ml HDPE No Pres	PAHSIM (2) 40ml Amber No Pres	Cl, S04, TDS - 250ml HDPE No Pres	Remarks	Sample # (lab only)
MW-01		GW		10/29/18	1420	9	X	X	X	X	X	X		-01
MW-02		GW		10/29/18	1335	9	X	X	X	X	X	X		02

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1039712

E031

Acctnum: **TERRALCO**

Template:

Prelogin:

TSR: **Daphne Richards**

PB:

Shipped Via:

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

Remarks: * Non-Preserved VOAs not provided
Take PAH volume from HDPE containers

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__UPS __FedEx __Courier __

Tracking # 4510 1654 8124

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (NO) HCL / MeoH TBR

Temp: 1.2 °C Bottles Received: 18

Date: 10/31/18 Time: 8145

If preservation required by Login: Date/Time

Hold:

Condition: (NCF) / OK

Pace Analytical®
National Center for Testing & Innovation

Login #: L1039712	Client: TERRALCO	Date: 10/31/18	Evaluated by: Jeremy

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type	x	Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courier
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: What Metals?

Client informed by:		Call		Email		Voice Mail		Date:	Time:
TSR Initials:	Client Contact:								

Login Instructions:

Please log diss. metals as: ASDICP, BADICP, BDICP, CDDICP, CRDICP, CUDICP, PBDICP, HGD, NIDICP, SEDICP, AGDICP, and ZNDICP
Also log CRICP, CR3, and CR6

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 07, 2018

Terracon Consultants, Inc - Longmont, CO

Sample Delivery Group:	L1039807
Samples Received:	10/31/2018
Project Number:	22187033
Description:	Future Knight O&G Well Site

Report To: Michael Skridulis
1242 Bramwood Place
Longmont, CO 80501

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

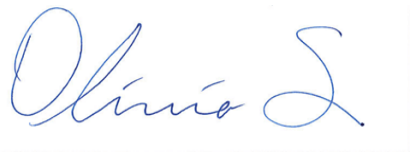
TABLE OF CONTENTS

SB-03 L1039807-01 Solid

Collected by	Collected date/time	Received date/time
Charles Covington	10/29/18 12:25	10/31/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1190126	1	11/04/18 21:47	11/05/18 17:37	ST
Calculated Results	WG1192332	1	11/06/18 22:41	11/07/18 01:58	TRB
Wet Chemistry by Method 3060A/7196A	WG1190085	1	11/02/18 10:46	11/02/18 16:02	MLW
Wet Chemistry by Method 9045D	WG1190221	1	11/02/18 08:15	11/02/18 09:48	KBW
Wet Chemistry by Method 9050AMod	WG1189493	1	11/02/18 19:07	11/03/18 15:00	TCC
Mercury by Method 7471A	WG1189729	1	11/01/18 10:34	11/01/18 17:02	TCT
Metals (ICP) by Method 6010B	WG1189483	1	11/01/18 13:33	11/04/18 16:01	ST
Metals (ICP) by Method 6010B	WG1189483	1	11/01/18 13:33	11/04/18 21:57	ST
Metals (ICP) by Method 6010B	WG1192332	1	11/06/18 22:41	11/07/18 01:58	TRB
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1191432	1	11/01/18 13:18	11/05/18 20:35	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1190130	1	11/01/18 13:18	11/02/18 15:15	JAH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1191819	1	11/05/18 20:55	11/06/18 16:35	KME
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1191391	1	11/05/18 14:00	11/05/18 20:18	DMG

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



Olivia Studebaker
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.53		1	11/05/2018 17:37	WG1190126

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	15.9		1.00	1	11/07/2018 01:58	WG1192332

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	11/02/2018 16:02	WG1190085

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.79	T8	1	11/02/2018 09:48	WG1190221

Sample Narrative:

L1039807-01 WG1190221: 7.79 at 18.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2010		10.0	1	11/03/2018 15:00	WG1189493

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0252		0.0200	1	11/01/2018 17:02	WG1189729

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.32		2.00	1	11/04/2018 21:57	WG1189483
Barium	52.1		0.500	1	11/04/2018 16:01	WG1189483
Boron	ND		10.0	1	11/04/2018 16:01	WG1189483
Cadmium	ND		0.500	1	11/04/2018 16:01	WG1189483
Chromium	15.9		1.00	1	11/07/2018 01:58	WG1192332
Copper	13.9		2.00	1	11/04/2018 16:01	WG1189483
Lead	18.7		0.500	1	11/04/2018 16:01	WG1189483
Nickel	21.0		2.00	1	11/04/2018 16:01	WG1189483
Selenium	ND		2.00	1	11/04/2018 16:01	WG1189483
Silver	ND		1.00	1	11/04/2018 16:01	WG1189483
Zinc	75.2		5.00	1	11/04/2018 16:01	WG1189483

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.508		0.100	1	11/05/2018 20:35	WG1191432
(S) a,a,a-Trifluorotoluene(FID)	*93.2*		*77.0-120*		*11/05/2018 20:35*	WG1191432

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acetone	ND		0.0250	1	11/02/2018 15:15	WG1190130
Acrylonitrile	ND		0.0125	1	11/02/2018 15:15	WG1190130
Benzene	ND	J3	0.00100	1	11/02/2018 15:15	WG1190130
Bromobenzene	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
Bromodichloromethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Bromoform	ND		0.0250	1	11/02/2018 15:15	WG1190130
Bromomethane	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
n-Butylbenzene	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
sec-Butylbenzene	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
tert-Butylbenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Carbon tetrachloride	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Chlorobenzene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Chlorodibromomethane	ND		0.00250	1	11/02/2018 15:15	WG1190130
Chloroethane	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Chloroform	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Chloromethane	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
2-Chlorotoluene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
4-Chlorotoluene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,2-Dibromo-3-Chloropropane	ND		0.0250	1	11/02/2018 15:15	WG1190130
1,2-Dibromoethane	ND		0.00250	1	11/02/2018 15:15	WG1190130
Dibromomethane	ND		0.00500	1	11/02/2018 15:15	WG1190130
1,2-Dichlorobenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,3-Dichlorobenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,4-Dichlorobenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Dichlorodifluoromethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
1,1-Dichloroethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
1,2-Dichloroethane	ND		0.00250	1	11/02/2018 15:15	WG1190130
1,1-Dichloroethene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
cis-1,2-Dichloroethene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
trans-1,2-Dichloroethene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,2-Dichloropropane	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,1-Dichloropropene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
1,3-Dichloropropane	ND		0.00500	1	11/02/2018 15:15	WG1190130
cis-1,3-Dichloropropene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
trans-1,3-Dichloropropene	ND		0.00500	1	11/02/2018 15:15	WG1190130
2,2-Dichloropropane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Di-isopropyl ether	ND	J3	0.00100	1	11/02/2018 15:15	WG1190130
Ethylbenzene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Hexachloro-1,3-butadiene	ND	J3	0.0250	1	11/02/2018 15:15	WG1190130
Isopropylbenzene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
p-Isopropyltoluene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
2-Butanone (MEK)	ND		0.0250	1	11/02/2018 15:15	WG1190130
Methylene Chloride	ND	J3	0.0250	1	11/02/2018 15:15	WG1190130
4-Methyl-2-pentanone (MIBK)	ND		0.0250	1	11/02/2018 15:15	WG1190130
Methyl tert-butyl ether	ND		0.00100	1	11/02/2018 15:15	WG1190130
Naphthalene	ND		0.0125	1	11/02/2018 15:15	WG1190130
n-Propylbenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Styrene	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
1,1,1,2-Tetrachloroethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
1,1,2,2-Tetrachloroethane	ND		0.00250	1	11/02/2018 15:15	WG1190130
1,1,2-Trichlorotrifluoroethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Tetrachloroethene	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Toluene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,2,3-Trichlorobenzene	ND		0.00250	1	11/02/2018 15:15	WG1190130
1,2,4-Trichlorobenzene	ND	J3	0.0125	1	11/02/2018 15:15	WG1190130
1,1,1-Trichloroethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichloroethane	ND		0.00250	1	11/02/2018 15:15	WG1190130
Trichloroethene	ND	J3	0.00100	1	11/02/2018 15:15	WG1190130
Trichlorofluoromethane	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
1,2,3-Trichloropropane	ND		0.0125	1	11/02/2018 15:15	WG1190130
1,2,4-Trimethylbenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,2,3-Trimethylbenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
1,3,5-Trimethylbenzene	ND	J3	0.00500	1	11/02/2018 15:15	WG1190130
Vinyl chloride	ND	J3	0.00250	1	11/02/2018 15:15	WG1190130
Xylenes, Total	ND	J3	0.00650	1	11/02/2018 15:15	WG1190130
(S) Toluene-d8	*115*		*75.0-131*		*11/02/2018 15:15*	WG1190130
(S) Dibromofluoromethane	*96.3*		*65.0-129*		*11/02/2018 15:15*	WG1190130
(S) 4-Bromofluorobenzene	*115*		*67.0-138*		*11/02/2018 15:15*	WG1190130

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		4.00	1	11/06/2018 16:35	WG1191819
C28-C40 Oil Range	ND		4.00	1	11/06/2018 16:35	WG1191819
(S) o-Terphenyl	*62.0*		*18.0-148*		*11/06/2018 16:35*	WG1191819

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Acenaphthene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Acenaphthylene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Benzo(a)anthracene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Benzo(a)pyrene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Benzo(b)fluoranthene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Benzo(g,h,i)perylene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Benzo(k)fluoranthene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Chrysene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Dibenz(a,h)anthracene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Fluoranthene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Fluorene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Naphthalene	ND		0.0200	1	11/05/2018 20:18	WG1191391
Phenanthrene	ND		0.00600	1	11/05/2018 20:18	WG1191391
Pyrene	ND		0.00600	1	11/05/2018 20:18	WG1191391
1-Methylnaphthalene	ND		0.0200	1	11/05/2018 20:18	WG1191391
2-Methylnaphthalene	ND		0.0200	1	11/05/2018 20:18	WG1191391
2-Chloronaphthalene	ND		0.0200	1	11/05/2018 20:18	WG1191391
(S) p-Terphenyl-d14	*57.4*		*23.0-120*		*11/05/2018 20:18*	WG1191391
(S) Nitrobenzene-d5	*74.7*		*14.0-149*		*11/05/2018 20:18*	WG1191391
(S) 2-Fluorobiphenyl	*67.8*		*34.0-125*		*11/05/2018 20:18*	WG1191391

Method Blank (MB)

(MB) R3356436-1 11/02/18 15:50

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1039204-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1039204-04 11/02/18 15:52 • (DUP) R3356436-3 11/02/18 15:52

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	0.000	1	0.000		20

L1039719-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1039719-01 11/02/18 16:01 • (DUP) R3356436-8 11/02/18 16:02

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	U	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3356436-2 11/02/18 15:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	23.0	95.8	80.0-120	

L1039278-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039278-04 11/02/18 15:55 • (MS) R3356436-4 11/02/18 15:56 • (MSD) R3356436-5 11/02/18 15:56

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	23.3	U	15.8	16.1	68.0	69.2	1	75.0-125	J6	J6	1.75	20

L1039278-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1039278-04 11/02/18 15:55 • (MS) R3356436-7 11/02/18 15:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	794	U	781	98.3	50	75.0-125	

L1039890-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1039890-04 11/02/18 09:48 • (DUP) R3356243-2 11/02/18 09:48

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.85	8.69	1	1.82	J3	1

Sample Narrative:

OS: 8.85 at 18.9C

DUP: 8.69 at 18.7C

L1040194-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1040194-01 11/02/18 09:48 • (DUP) R3356243-3 11/02/18 09:48

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.59	8.56	1	0.350		1

Sample Narrative:

OS: 8.59 at 18.4C

DUP: 8.56 at 18.3C

Laboratory Control Sample (LCS)

(LCS) R3356243-1 11/02/18 09:48

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.96	99.6	99.0-101	

Sample Narrative:

LCS: 9.96 at 16.2C

Method Blank (MB)

(MB) R3356621-1 11/03/18 15:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

L1039204-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1039204-06 11/03/18 15:00 • (DUP) R3356621-3 11/03/18 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	10300	10400	1	0.966		20

Laboratory Control Sample (LCS)

(LCS) R3356621-2 11/03/18 15:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	umhos/cm	umhos/cm	%	%	
Specific Conductance	1160	1170	101	85.0-115	

Method Blank (MB)

(MB) R3356154-1 11/01/18 15:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.00280	0.0200

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

(LCS) R3356154-2 11/01/18 15:55 • (LCSD) R3356154-3 11/01/18 16:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.250	0.249	83.2	83.0	80.0-120			0.276	20

L1039607-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039607-02 11/01/18 16:08 • (MS) R3356154-4 11/01/18 16:11 • (MSD) R3356154-5 11/01/18 16:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	ND	0.0664	0.124	22.1	41.2	1	75.0-125	J6	J3 J6	60.2	20

Method Blank (MB)

(MB) R3356764-1 11/04/18 14:40

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Boron	U		1.26	10.0
Cadmium	U		0.0700	0.500
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	U		0.590	5.00

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

(LCS) R3356764-2 11/04/18 14:42 • (LCSD) R3356764-3 11/04/18 14:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	101	101	101	101	80.0-120			0.601	20
Barium	100	103	103	103	103	80.0-120			0.0200	20
Boron	100	95.6	96.1	95.6	96.1	80.0-120			0.527	20
Cadmium	100	102	102	102	102	80.0-120			0.00246	20
Copper	100	97.1	97.8	97.1	97.8	80.0-120			0.676	20
Lead	100	99.0	99.3	99.0	99.3	80.0-120			0.316	20
Nickel	100	99.2	99.3	99.2	99.3	80.0-120			0.131	20
Selenium	100	101	101	101	101	80.0-120			0.127	20
Silver	20.0	17.8	18.0	88.8	89.8	80.0-120			1.13	20
Zinc	100	99.0	99.0	99.0	99.0	80.0-120			0.0345	20

L1039694-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039694-01 11/04/18 14:47 • (MS) R3356764-6 11/04/18 14:55 • (MSD) R3356764-7 11/04/18 14:58

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	106	U	98.9	99.9	93.0	93.9	1	75.0-125			1.02	20
Barium	106	98.8	205	216	99.8	110	1	75.0-125			5.13	20
Boron	106	U	93.4	93.9	87.9	88.3	1	75.0-125			0.482	20
Cadmium	106	0.120	101	102	95.3	95.9	1	75.0-125			0.630	20
Copper	106	8.00	110	111	95.9	96.4	1	75.0-125			0.496	20
Lead	106	60.3	164	168	97.5	101	1	75.0-125			2.42	20

L1039694-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039694-01 11/04/18 14:47 • (MS) R3356764-6 11/04/18 14:55 • (MSD) R3356764-7 11/04/18 14:58

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nickel	106	4.71	110	111	98.7	100	1	75.0-125			1.34	20
Selenium	106	U	98.3	99.0	92.5	93.2	1	75.0-125			0.743	20
Silver	21.3	U	18.1	18.1	85.2	85.0	1	75.0-125			0.319	20
Zinc	106	77.8	171	173	87.7	89.7	1	75.0-125			1.25	20

Method Blank (MB)

(MB) R3357545-1 11/07/18 01:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium	U		0.140	1.00

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

(LCS) R3357545-2 11/07/18 01:39 • (LCSD) R3357545-3 11/07/18 01:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chromium	100	95.8	99.0	95.8	99.0	80.0-120			3.28	20

L1040860-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040860-01 11/07/18 01:45 • (MS) R3357545-6 11/07/18 01:53 • (MSD) R3357545-7 11/07/18 01:55

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium	100	10.4	104	104	93.2	94.1	1	75.0-125			0.882	20

Method Blank (MB)

(MB) R3356976-3 11/05/18 10:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*99.8*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R3356976-2 11/05/18 09:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.89	107	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*104*	*77.0-120*	

L1040226-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1040226-02 11/05/18 12:55 • (MS) R3356976-4 11/05/18 13:19 • (MSD) R3356976-5 11/05/18 13:43

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	2.72	81.5	78.5	57.3	55.1	25	10.0-151			3.74	28
(S) a,a,a-Trifluorotoluene(FID)					*104*	*104*		*77.0-120*				

Method Blank (MB)

(MB) R3356385-2 11/02/18 12:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0137	0.0250
Acrylonitrile	U		0.00190	0.0125
Benzene	U		0.000400	0.00100
Bromobenzene	U		0.00105	0.0125
Bromodichloromethane	U		0.000788	0.00250
Bromoform	U		0.00598	0.0250
Bromomethane	U		0.00370	0.0125
n-Butylbenzene	U		0.00384	0.0125
sec-Butylbenzene	U		0.00253	0.0125
tert-Butylbenzene	U		0.00155	0.00500
Carbon tetrachloride	U		0.00108	0.00500
Chlorobenzene	U		0.000573	0.00250
Chlorodibromomethane	U		0.000450	0.00250
Chloroethane	U		0.00108	0.00500
Chloroform	U		0.000415	0.00250
Chloromethane	U		0.00139	0.0125
2-Chlorotoluene	U		0.000920	0.00250
4-Chlorotoluene	U		0.00113	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00510	0.0250
1,2-Dibromoethane	U		0.000525	0.00250
Dibromomethane	U		0.00100	0.00500
1,2-Dichlorobenzene	U		0.00145	0.00500
1,3-Dichlorobenzene	U		0.00170	0.00500
1,4-Dichlorobenzene	U		0.00197	0.00500
Dichlorodifluoromethane	U		0.000818	0.00250
1,1-Dichloroethane	U		0.000575	0.00250
1,2-Dichloroethane	U		0.000475	0.00250
1,1-Dichloroethene	U		0.000500	0.00250
cis-1,2-Dichloroethene	U		0.000690	0.00250
trans-1,2-Dichloroethene	U		0.00143	0.00500
1,2-Dichloropropane	U		0.00127	0.00500
1,1-Dichloropropene	U		0.000700	0.00250
1,3-Dichloropropane	U		0.00175	0.00500
cis-1,3-Dichloropropene	U		0.000678	0.00250
trans-1,3-Dichloropropene	U		0.00153	0.00500
2,2-Dichloropropane	U		0.000793	0.00250
Di-isopropyl ether	U		0.000350	0.00100
Ethylbenzene	U		0.000530	0.00250
Hexachloro-1,3-butadiene	U		0.0127	0.0250
Isopropylbenzene	U		0.000863	0.00250

Method Blank (MB)

(MB) R3356385-2 11/02/18 12:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00233	0.00500
2-Butanone (MEK)	U		0.0125	0.0250
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.0100	0.0250
Methyl tert-butyl ether	U		0.000295	0.00100
Naphthalene	U		0.00312	0.0125
n-Propylbenzene	U		0.00118	0.00500
Styrene	U		0.00273	0.0125
1,1,1,2-Tetrachloroethane	U		0.000500	0.00250
1,1,2,2-Tetrachloroethane	U		0.000390	0.00250
Tetrachloroethene	U		0.000700	0.00250
Toluene	U		0.00125	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000675	0.00250
1,2,3-Trichlorobenzene	U		0.000625	0.00250
1,2,4-Trichlorobenzene	U		0.00482	0.0125
1,1,1-Trichloroethane	U		0.000275	0.00250
1,1,2-Trichloroethane	U		0.000883	0.00250
Trichloroethene	U		0.000400	0.00100
Trichlorofluoromethane	U		0.000500	0.00250
1,2,3-Trichloropropane	U		0.00510	0.0125
1,2,3-Trimethylbenzene	U		0.00115	0.00500
1,2,4-Trimethylbenzene	U		0.00116	0.00500
1,3,5-Trimethylbenzene	U		0.00108	0.00500
Vinyl chloride	U		0.000683	0.00250
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*116*			*75.0-131*
(S) Dibromofluoromethane	*93.0*			*65.0-129*
(S) 4-Bromofluorobenzene	*112*			*67.0-138*

Laboratory Control Sample (LCS)

(LCS) R3356385-1 11/02/18 11:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.625	0.586	93.7	10.0-160	
Acrylonitrile	0.625	0.494	79.1	45.0-153	
Benzene	0.125	0.122	97.8	70.0-123	
Bromobenzene	0.125	0.127	102	73.0-121	
Bromodichloromethane	0.125	0.116	92.8	73.0-121	

Laboratory Control Sample (LCS)

(LCS) R3356385-1 11/02/18 11:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromoform	0.125	0.121	96.8	64.0-132	
Bromomethane	0.125	0.116	92.7	56.0-147	
n-Butylbenzene	0.125	0.117	93.9	68.0-135	
sec-Butylbenzene	0.125	0.122	97.9	74.0-130	
tert-Butylbenzene	0.125	0.124	99.6	75.0-127	
Carbon tetrachloride	0.125	0.116	93.2	66.0-128	
Chlorobenzene	0.125	0.123	98.3	76.0-128	
Chlorodibromomethane	0.125	0.118	94.8	74.0-127	
Chloroethane	0.125	0.105	83.7	61.0-134	
Chloroform	0.125	0.115	92.1	72.0-123	
Chloromethane	0.125	0.154	123	51.0-138	
2-Chlorotoluene	0.125	0.127	102	75.0-124	
4-Chlorotoluene	0.125	0.116	92.9	75.0-124	
1,2-Dibromo-3-Chloropropane	0.125	0.108	86.4	59.0-130	
1,2-Dibromoethane	0.125	0.124	99.2	74.0-128	
Dibromomethane	0.125	0.127	101	75.0-122	
1,2-Dichlorobenzene	0.125	0.113	90.6	76.0-124	
1,3-Dichlorobenzene	0.125	0.115	91.9	76.0-125	
1,4-Dichlorobenzene	0.125	0.113	90.8	77.0-121	
Dichlorodifluoromethane	0.125	0.130	104	43.0-156	
1,1-Dichloroethane	0.125	0.110	88.0	70.0-127	
1,2-Dichloroethane	0.125	0.120	96.1	65.0-131	
1,1-Dichloroethene	0.125	0.111	88.5	65.0-131	
cis-1,2-Dichloroethene	0.125	0.124	99.2	73.0-125	
trans-1,2-Dichloroethene	0.125	0.109	87.4	71.0-125	
1,2-Dichloropropane	0.125	0.121	97.0	74.0-125	
1,1-Dichloropropene	0.125	0.107	85.3	73.0-125	
1,3-Dichloropropane	0.125	0.128	102	80.0-125	
cis-1,3-Dichloropropene	0.125	0.116	92.4	76.0-127	
trans-1,3-Dichloropropene	0.125	0.119	95.3	73.0-127	
2,2-Dichloropropane	0.125	0.0984	78.7	59.0-135	
Di-isopropyl ether	0.125	0.102	81.9	60.0-136	
Ethylbenzene	0.125	0.117	94.0	74.0-126	
Hexachloro-1,3-butadiene	0.125	0.110	87.7	57.0-150	
Isopropylbenzene	0.125	0.124	99.4	72.0-127	
p-Isopropyltoluene	0.125	0.123	98.3	72.0-133	
2-Butanone (MEK)	0.625	0.568	90.9	30.0-160	
Methylene Chloride	0.125	0.113	90.6	68.0-123	
4-Methyl-2-pentanone (MIBK)	0.625	0.608	97.3	56.0-143	
Methyl tert-butyl ether	0.125	0.113	90.4	66.0-132	

Laboratory Control Sample (LCS)

(LCS) R3356385-1 11/02/18 11:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Naphthalene	0.125	0.116	92.5	59.0-130	
n-Propylbenzene	0.125	0.119	94.9	74.0-126	
Styrene	0.125	0.118	94.8	72.0-127	
1,1,1,2-Tetrachloroethane	0.125	0.120	96.3	74.0-129	
1,1,2,2-Tetrachloroethane	0.125	0.108	86.3	68.0-128	
Tetrachloroethene	0.125	0.120	95.8	70.0-136	
Toluene	0.125	0.115	92.3	75.0-121	
1,1,2-Trichlorotrifluoroethane	0.125	0.138	110	61.0-139	
1,2,3-Trichlorobenzene	0.125	0.127	102	59.0-139	
1,2,4-Trichlorobenzene	0.125	0.114	91.6	62.0-137	
1,1,1-Trichloroethane	0.125	0.120	96.0	69.0-126	
1,1,2-Trichloroethane	0.125	0.118	94.7	78.0-123	
Trichloroethene	0.125	0.127	101	76.0-126	
Trichlorofluoromethane	0.125	0.121	97.2	61.0-142	
1,2,3-Trichloropropane	0.125	0.128	103	67.0-129	
1,2,3-Trimethylbenzene	0.125	0.119	95.0	74.0-124	
1,2,4-Trimethylbenzene	0.125	0.116	92.8	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.119	95.0	73.0-127	
Vinyl chloride	0.125	0.118	94.4	63.0-134	
Xylenes, Total	0.375	0.358	95.5	72.0-127	
(S) Toluene-d8			*113*	*75.0-131*	
(S) Dibromofluoromethane			*106*	*65.0-129*	
(S) 4-Bromofluorobenzene			*113*	*67.0-138*	

L1039807-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039807-01 11/02/18 15:15 • (MS) R3356385-3 11/02/18 19:54 • (MSD) R3356385-4 11/02/18 20:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	ND	0.236	0.252	37.8	40.4	1	10.0-160			6.69	40
Acrylonitrile	0.625	ND	0.337	0.327	54.0	52.3	1	10.0-160			3.14	40
Benzene	0.125	ND	0.0440	0.0949	35.2	75.9	1	10.0-149		J3	73.3	37
Bromobenzene	0.125	ND	0.0688	0.112	55.0	89.6	1	10.0-156		J3	47.8	38
Bromodichloromethane	0.125	ND	0.0667	0.102	53.4	81.7	1	10.0-143		J3	41.9	37
Bromoform	0.125	ND	0.0821	0.0958	65.7	76.6	1	10.0-146			15.4	36
Bromomethane	0.125	ND	0.0287	0.0578	23.0	46.3	1	10.0-149		J3	67.3	38
n-Butylbenzene	0.125	ND	0.0481	0.126	38.4	100	1	10.0-160		J3	89.3	40
sec-Butylbenzene	0.125	ND	0.0415	0.115	33.2	92.4	1	10.0-159		J3	94.2	39
tert-Butylbenzene	0.125	ND	0.0423	0.113	33.8	90.5	1	10.0-156		J3	91.2	39

L1039807-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039807-01 11/02/18 15:15 • (MS) R3356385-3 11/02/18 19:54 • (MSD) R3356385-4 11/02/18 20:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	0.125	ND	0.0276	0.0934	22.0	74.7	1	10.0-145		J3	109	37
Chlorobenzene	0.125	ND	0.0615	0.111	49.2	88.5	1	10.0-152		J3	57.2	39
Chlorodibromomethane	0.125	ND	0.0820	0.108	65.6	86.6	1	10.0-146			27.7	37
Chloroethane	0.125	ND	0.0227	0.0635	18.1	50.8	1	10.0-146		J3	94.8	40
Chloroform	0.125	ND	0.0478	0.0919	38.2	73.5	1	10.0-146		J3	63.2	37
Chloromethane	0.125	ND	0.0307	0.0888	24.6	71.0	1	10.0-159		J3	97.2	37
2-Chlorotoluene	0.125	ND	0.0520	0.114	41.6	91.3	1	10.0-159		J3	74.7	38
4-Chlorotoluene	0.125	ND	0.0528	0.102	42.3	81.6	1	10.0-155		J3	63.6	39
1,2-Dibromo-3-Chloropropane	0.125	ND	0.0729	0.0823	58.3	65.8	1	10.0-151			12.1	39
1,2-Dibromoethane	0.125	ND	0.0842	0.107	67.3	85.8	1	10.0-148			24.1	34
Dibromomethane	0.125	ND	0.0761	0.0964	60.9	77.1	1	10.0-147			23.6	35
1,2-Dichlorobenzene	0.125	ND	0.0718	0.106	57.5	84.4	1	10.0-155		J3	38.0	37
1,3-Dichlorobenzene	0.125	ND	0.0639	0.111	51.1	88.5	1	10.0-153		J3	53.6	38
1,4-Dichlorobenzene	0.125	ND	0.0684	0.106	54.8	84.9	1	10.0-151		J3	43.1	38
Dichlorodifluoromethane	0.125	ND	0.0168	0.0853	13.4	68.3	1	10.0-160		J3	134	35
1,1-Dichloroethane	0.125	ND	0.0408	0.0903	32.6	72.2	1	10.0-147		J3	75.6	37
1,2-Dichloroethane	0.125	ND	0.0700	0.0942	56.0	75.4	1	10.0-148			29.5	35
1,1-Dichloroethene	0.125	ND	0.0224	0.0776	17.9	62.1	1	10.0-155		J3	110	37
cis-1,2-Dichloroethene	0.125	ND	0.0510	0.0960	40.8	76.8	1	10.0-149		J3	61.2	37
trans-1,2-Dichloroethene	0.125	ND	0.0292	0.0748	23.4	59.9	1	10.0-150		J3	87.7	37
1,2-Dichloropropane	0.125	ND	0.0641	0.103	51.3	82.4	1	10.0-148		J3	46.5	37
1,1-Dichloropropene	0.125	ND	0.0221	0.0739	17.6	59.1	1	10.0-153		J3	108	35
1,3-Dichloropropane	0.125	ND	0.0864	0.111	69.1	88.5	1	10.0-154			24.6	35
cis-1,3-Dichloropropene	0.125	ND	0.0678	0.102	54.2	81.7	1	10.0-151		J3	40.4	37
trans-1,3-Dichloropropene	0.125	ND	0.0776	0.105	62.1	83.8	1	10.0-148			29.8	37
2,2-Dichloropropane	0.125	ND	0.0315	0.0931	25.2	74.5	1	10.0-138		J3	99.0	36
Di-isopropyl ether	0.125	ND	0.0527	0.0839	42.1	67.1	1	10.0-147		J3	45.7	36
Ethylbenzene	0.125	ND	0.0425	0.106	34.0	84.6	1	10.0-160		J3	85.3	38
Hexachloro-1,3-butadiene	0.125	ND	0.0509	0.122	40.7	97.2	1	10.0-160		J3	82.0	40
Isopropylbenzene	0.125	ND	0.0416	0.109	33.3	87.0	1	10.0-155		J3	89.4	38
p-Isopropyltoluene	0.125	ND	0.0444	0.114	35.5	91.1	1	10.0-160		J3	87.8	40
2-Butanone (MEK)	0.625	ND	0.422	0.384	67.5	61.5	1	10.0-160			9.37	40
Methylene Chloride	0.125	ND	0.0587	0.0890	41.1	65.4	1	10.0-141		J3	41.1	37
4-Methyl-2-pentanone (MIBK)	0.625	ND	0.421	0.438	67.4	70.0	1	10.0-160			3.79	35
Methyl tert-butyl ether	0.125	ND	0.0719	0.0853	57.5	68.2	1	11.0-147			17.0	35
Naphthalene	0.125	ND	0.0972	0.107	75.0	82.6	1	10.0-160			9.35	36
n-Propylbenzene	0.125	ND	0.0432	0.107	34.6	85.4	1	10.0-158		J3	84.8	38
Styrene	0.125	ND	0.0629	0.107	50.4	85.5	1	10.0-160		J3	51.7	40
1,1,1,2-Tetrachloroethane	0.125	ND	0.0651	0.106	52.1	85.2	1	10.0-149		J3	48.2	39
1,1,2,2-Tetrachloroethane	0.125	ND	0.0841	0.0925	67.3	74.0	1	10.0-160			9.52	35

L1039807-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039807-01 11/02/18 15:15 • (MS) R3356385-3 11/02/18 19:54 • (MSD) R3356385-4 11/02/18 20:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.125	ND	0.0339	0.105	27.1	83.7	1	10.0-156		J3	102	39
Toluene	0.125	ND	0.0439	0.0968	35.1	77.4	1	10.0-156		J3	75.1	38
1,1,2-Trichlorotrifluoroethane	0.125	ND	0.0211	0.109	16.8	87.2	1	10.0-160		J3	135	36
1,2,3-Trichlorobenzene	0.125	ND	0.0916	0.125	73.3	99.9	1	10.0-160			30.7	40
1,2,4-Trichlorobenzene	0.125	ND	0.0816	0.123	65.3	98.8	1	10.0-160		J3	40.8	40
1,1,1-Trichloroethane	0.125	ND	0.0304	0.0977	24.4	78.2	1	10.0-144		J3	105	35
1,1,2-Trichloroethane	0.125	ND	0.0858	0.113	68.6	90.6	1	10.0-160			27.6	35
Trichloroethene	0.125	ND	0.0382	0.103	30.5	82.6	1	10.0-156		J3	92.1	38
Trichlorofluoromethane	0.125	ND	0.0247	0.0941	19.7	75.3	1	10.0-160		J3	117	40
1,2,3-Trichloropropane	0.125	ND	0.0868	0.0953	69.4	76.3	1	10.0-156			9.39	35
1,2,3-Trimethylbenzene	0.125	ND	0.0590	0.101	47.2	80.7	1	10.0-160		J3	52.3	36
1,2,4-Trimethylbenzene	0.125	ND	0.0549	0.109	44.0	87.1	1	10.0-160		J3	65.9	36
1,3,5-Trimethylbenzene	0.125	ND	0.0486	0.105	38.9	84.3	1	10.0-160		J3	73.7	38
Vinyl chloride	0.125	ND	0.0208	0.0719	16.7	57.5	1	10.0-160		J3	110	37
Xylenes, Total	0.375	ND	0.145	0.310	38.7	82.7	1	10.0-160		J3	72.5	38
(S) Toluene-d8					*116*	*115*		*75.0-131*				
(S) Dibromofluoromethane					*99.2*	*97.3*		*65.0-129*				
(S) 4-Bromofluorobenzene					*112*	*109*		*67.0-138*				

Method Blank (MB)

(MB) R3357494-1 11/06/18 15:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*83.2*			*18.0-148*

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

(LCS) R3357494-2 11/06/18 15:22 • (LCSD) R3357494-3 11/06/18 15:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	50.0	32.1	34.6	64.2	69.2	50.0-150			7.50	20
(S) o-Terphenyl				*80.6*	*91.0*	*18.0-148*				

Method Blank (MB)

(MB) R3357221-3 11/05/18 19:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	*91.8*			*14.0-149*
(S) 2-Fluorobiphenyl	*87.1*			*34.0-125*
(S) p-Terphenyl-d14	*75.2*			*23.0-120*

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

(LCS) R3357221-1 11/05/18 19:14 • (LCSD) R3357221-2 11/05/18 19:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.0696	0.0700	87.0	87.5	50.0-126			0.573	20
Acenaphthene	0.0800	0.0659	0.0651	82.4	81.4	50.0-120			1.22	20
Acenaphthylene	0.0800	0.0666	0.0652	83.3	81.5	50.0-120			2.12	20
Benzo(a)anthracene	0.0800	0.0626	0.0629	78.3	78.6	45.0-120			0.478	20
Benzo(a)pyrene	0.0800	0.0554	0.0566	69.3	70.8	42.0-120			2.14	20
Benzo(b)fluoranthene	0.0800	0.0613	0.0639	76.6	79.9	42.0-121			4.15	20
Benzo(g,h,i)perylene	0.0800	0.0620	0.0626	77.5	78.3	45.0-125			0.963	20
Benzo(k)fluoranthene	0.0800	0.0694	0.0671	86.8	83.9	49.0-125			3.37	20
Chrysene	0.0800	0.0697	0.0707	87.1	88.4	49.0-122			1.42	20
Dibenz(a,h)anthracene	0.0800	0.0630	0.0632	78.8	79.0	47.0-125			0.317	20
Fluoranthene	0.0800	0.0743	0.0744	92.9	93.0	49.0-129			0.135	20

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

(LCS) R3357221-1 11/05/18 19:14 • (LCSD) R3357221-2 11/05/18 19:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.0800	0.0642	0.0639	80.3	79.9	49.0-120			0.468	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0635	0.0637	79.4	79.6	46.0-125			0.314	20
Naphthalene	0.0800	0.0642	0.0622	80.3	77.8	50.0-120			3.16	20
Phenanthrene	0.0800	0.0653	0.0656	81.6	82.0	47.0-120			0.458	20
Pyrene	0.0800	0.0600	0.0598	75.0	74.8	43.0-123			0.334	20
1-Methylnaphthalene	0.0800	0.0689	0.0672	86.1	84.0	51.0-121			2.50	20
2-Methylnaphthalene	0.0800	0.0630	0.0613	78.8	76.6	50.0-120			2.74	20
2-Chloronaphthalene	0.0800	0.0679	0.0664	84.9	83.0	50.0-120			2.23	20
(S) Nitrobenzene-d5				*100*	*96.3*	*14.0-149*				
(S) 2-Fluorobiphenyl				*90.5*	*89.0*	*34.0-125*				
(S) p-Terphenyl-d14				*78.8*	*77.3*	*23.0-120*				

L1039823-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1039823-01 11/05/18 20:39 • (MS) R3357221-4 11/05/18 21:00 • (MSD) R3357221-5 11/05/18 21:21

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0845	0.000685	0.0757	0.0705	88.8	82.7	1	10.0-145			7.08	30
Acenaphthene	0.0845	U	0.0664	0.0625	78.6	74.0	1	14.0-127			6.06	27
Acenaphthylene	0.0845	U	0.0674	0.0636	79.8	75.3	1	21.0-124			5.81	25
Benzo(a)anthracene	0.0845	U	0.0667	0.0609	79.0	72.1	1	10.0-139			9.10	30
Benzo(a)pyrene	0.0845	0.00212	0.0689	0.0641	79.0	73.4	1	10.0-141			7.15	31
Benzo(b)fluoranthene	0.0845	0.00161	0.0620	0.0586	71.5	67.5	1	10.0-140			5.60	36
Benzo(g,h,i)perylene	0.0845	0.0199	0.0902	0.0860	83.3	78.3	1	10.0-140			4.80	33
Benzo(k)fluoranthene	0.0845	U	0.0677	0.0639	80.1	75.6	1	10.0-137			5.78	31
Chrysene	0.0845	U	0.0689	0.0640	81.5	75.8	1	10.0-145			7.31	30
Dibenz(a,h)anthracene	0.0845	0.00174	0.0695	0.0646	80.2	74.4	1	10.0-132			7.24	31
Fluoranthene	0.0845	U	0.0797	0.0743	94.4	88.0	1	10.0-153			6.99	33
Fluorene	0.0845	U	0.0642	0.0601	76.0	71.1	1	11.0-130			6.63	29
Indeno(1,2,3-cd)pyrene	0.0845	0.00867	0.0772	0.0730	81.1	76.1	1	10.0-137			5.63	32
Naphthalene	0.0845	0.00470	0.0695	0.0657	76.7	72.2	1	10.0-135			5.63	27
Phenanthrene	0.0845	0.000641	0.0648	0.0607	76.0	71.1	1	10.0-144			6.56	31
Pyrene	0.0845	0.000666	0.0619	0.0565	72.5	66.1	1	10.0-148			9.10	35
1-Methylnaphthalene	0.0845	0.00392	0.0747	0.0693	83.7	77.4	1	10.0-142			7.48	28
2-Methylnaphthalene	0.0845	0.00442	0.0709	0.0644	78.6	71.0	1	10.0-137			9.52	28
2-Chloronaphthalene	0.0845	U	0.0683	0.0646	80.9	76.5	1	29.0-120			5.56	24
(S) Nitrobenzene-d5					*90.3*	*97.8*		*14.0-149*				
(S) 2-Fluorobiphenyl					*82.5*	*87.8*		*34.0-125*				
(S) p-Terphenyl-d14					*73.4*	*78.1*		*23.0-120*				

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

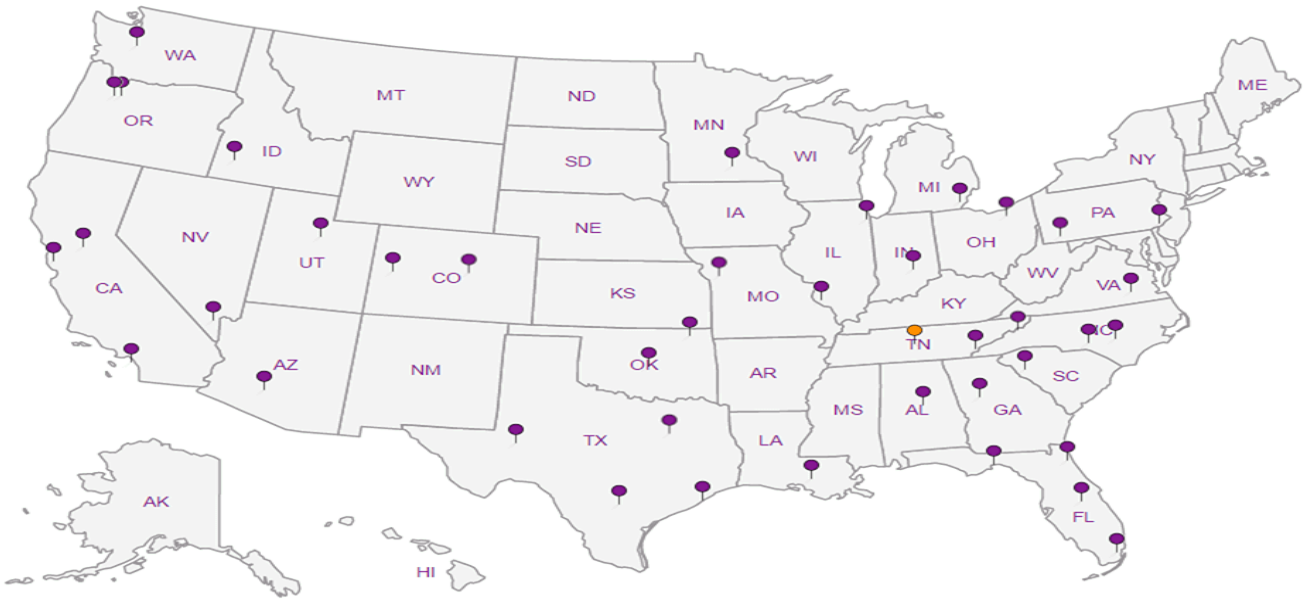
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Terracon-Longmont
12831 Lefthand Circle, Suite C
Longmont, Colorado 80501

Billing Information: **SAME AS ADDRESS**

Report to: **Mike Skridulis**

Email To: **mike.skriduis@terracon.com**

Project Description: **Future Knight O&G Well Site**

City/State Collected: **Longmont, CO**

Phone: **303-454-5249**
Fax: **970-484-0454**

Client Project # **22187033**

Lab Project #

Collected by (print): **Charles A. Covington**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC 8260	TPH-GRO 8260	TPH-DRO 8015	TPH-ORO 8015	PAHSIM	EC 9050A	SAR 3050B	pH 9045D	Metals (arsenic, barium, boron, Cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, silver, zinc)		Remarks	Sample # (lab only)
SB-03	Grab	SS	15-17 ft	10/29/2018	1225	2	X	X	X	X	X	X	X	X	X			-01

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1039807

E033

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 4510 1654 8124

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: Y __N
Bottles arrive intact: Y __N
Correct bottles used: Y __N
Sufficient volume sent: Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 12.5-1 °C Bottles Received: 2
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/31/18 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 14, 2018

Terracon Consultants, Inc - Longmont, CO

Sample Delivery Group:	L1042067
Samples Received:	11/07/2018
Project Number:	22187033
Description:	

Report To: Michael Skridulis
1242 Bramwood Place
Longmont, CO 80501

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

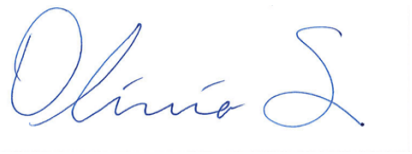
TABLE OF CONTENTS

MW-03 L1042067-01 GW

Collected by	Collected date/time	Received date/time
Charles Covington	11/02/18 13:25	11/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1194486	1	11/10/18 13:45	11/12/18 13:38	ST
Gravimetric Analysis by Method 2540 C-2011	WG1193495	1	11/09/18 19:46	11/09/18 20:15	AJS
Wet Chemistry by Method 4500CO2 D-2011	WG1195512	1	11/13/18 17:46	11/13/18 17:46	GB
Wet Chemistry by Method 7196A	WG1194061	1	11/09/18 12:19	11/09/18 12:19	KK
Wet Chemistry by Method 9056A	WG1194397	5	11/10/18 12:34	11/10/18 12:34	MAJ
Wet Chemistry by Method 9056A	WG1194397	50	11/10/18 12:43	11/10/18 12:43	MAJ
Mercury by Method 7470A	WG1194894	1	11/12/18 12:17	11/12/18 18:44	TCT
Metals (ICP) by Method 6010B	WG1193837	1	11/13/18 10:36	11/13/18 13:48	ST
Metals (ICP) by Method 6010B	WG1194486	1	11/10/18 13:45	11/12/18 13:38	ST
Volatile Organic Compounds (GC) by Method RSK175	WG1193709	1	11/09/18 11:17	11/09/18 11:17	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1193134	1	11/08/18 04:40	11/08/18 04:40	DWR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1193607	1	11/08/18 20:06	11/09/18 12:57	DMG

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



Olivia Studebaker
Project Manager

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chromium,Trivalent	ND		0.0100	1	11/12/2018 13:38	WG1194486

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	7270		100	1	11/09/2018 20:15	WG1193495

Wet Chemistry by Method 4500CO2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Free Carbon Dioxide	ND	T8	20.0	1	11/13/2018 17:46	WG1195512

Sample Narrative:

L1042067-01 WG1195512: Endpoint pH 4.5 headspace

Wet Chemistry by Method 7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chromium,Hexavalent	ND	T8	0.0100	1	11/09/2018 12:19	WG1194061

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	173		5.00	5	11/10/2018 12:34	WG1194397
Sulfate	4500		250	50	11/10/2018 12:43	WG1194397

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	11/12/2018 18:44	WG1194894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic,Dissolved	ND		0.0100	1	11/13/2018 13:48	WG1193837
Barium,Dissolved	0.0480		0.00500	1	11/13/2018 13:48	WG1193837
Boron,Dissolved	0.508		0.200	1	11/13/2018 13:48	WG1193837
Chromium	ND		0.0100	1	11/12/2018 13:38	WG1194486
Chromium,Dissolved	ND		0.0100	1	11/13/2018 13:48	WG1193837
Copper,Dissolved	ND		0.0100	1	11/13/2018 13:48	WG1193837
Lead,Dissolved	ND		0.00500	1	11/13/2018 13:48	WG1193837
Nickel,Dissolved	ND		0.0100	1	11/13/2018 13:48	WG1193837
Selenium,Dissolved	0.0816		0.0100	1	11/13/2018 13:48	WG1193837
Silver,Dissolved	ND		0.00500	1	11/13/2018 13:48	WG1193837
Zinc,Dissolved	ND		0.0500	1	11/13/2018 13:48	WG1193837

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Methane	ND		0.0100	1	11/09/2018 11:17	WG1193709
Ethane	ND		0.0130	1	11/09/2018 11:17	WG1193709
Ethene	ND		0.0130	1	11/09/2018 11:17	WG1193709

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		0.0500	1	11/08/2018 04:40	WG1193134
Acrolein	ND	J4	0.0500	1	11/08/2018 04:40	WG1193134
Acrylonitrile	ND		0.0100	1	11/08/2018 04:40	WG1193134
Benzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Bromobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Bromodichloromethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
Bromoform	ND		0.00100	1	11/08/2018 04:40	WG1193134
Bromomethane	ND		0.00500	1	11/08/2018 04:40	WG1193134
n-Butylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
sec-Butylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
tert-Butylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Carbon tetrachloride	ND		0.00100	1	11/08/2018 04:40	WG1193134
Chlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Chlorodibromomethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
Chloroethane	ND		0.00500	1	11/08/2018 04:40	WG1193134
Chloroform	ND		0.00500	1	11/08/2018 04:40	WG1193134
Chloromethane	ND		0.00250	1	11/08/2018 04:40	WG1193134
2-Chlorotoluene	ND		0.00100	1	11/08/2018 04:40	WG1193134
4-Chlorotoluene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	11/08/2018 04:40	WG1193134
1,2-Dibromoethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
Dibromomethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2-Dichlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,3-Dichlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,4-Dichlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Dichlorodifluoromethane	ND		0.00500	1	11/08/2018 04:40	WG1193134
1,1-Dichloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2-Dichloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1-Dichloroethene	ND		0.00100	1	11/08/2018 04:40	WG1193134
cis-1,2-Dichloroethene	ND		0.00100	1	11/08/2018 04:40	WG1193134
trans-1,2-Dichloroethene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2-Dichloropropane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1-Dichloropropene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,3-Dichloropropane	ND		0.00100	1	11/08/2018 04:40	WG1193134
cis-1,3-Dichloropropene	ND		0.00100	1	11/08/2018 04:40	WG1193134
trans-1,3-Dichloropropene	ND		0.00100	1	11/08/2018 04:40	WG1193134
2,2-Dichloropropane	ND	J4	0.00100	1	11/08/2018 04:40	WG1193134
Di-isopropyl ether	ND		0.00100	1	11/08/2018 04:40	WG1193134
Ethylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Hexachloro-1,3-butadiene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Isopropylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
p-Isopropyltoluene	ND		0.00100	1	11/08/2018 04:40	WG1193134
2-Butanone (MEK)	ND		0.0100	1	11/08/2018 04:40	WG1193134
Methylene Chloride	ND		0.00500	1	11/08/2018 04:40	WG1193134
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	11/08/2018 04:40	WG1193134
Methyl tert-butyl ether	ND		0.00100	1	11/08/2018 04:40	WG1193134
Naphthalene	ND		0.00500	1	11/08/2018 04:40	WG1193134
n-Propylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Styrene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1,1,2-Tetrachloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1,2,2-Tetrachloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1,2-Trichlorotrifluoroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
Tetrachloroethene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Toluene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2,3-Trichlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2,4-Trichlorobenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,1,2-Trichloroethane	ND		0.00100	1	11/08/2018 04:40	WG1193134
Trichloroethene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Trichlorofluoromethane	ND		0.00500	1	11/08/2018 04:40	WG1193134
1,2,3-Trichloropropane	ND		0.00250	1	11/08/2018 04:40	WG1193134
1,2,4-Trimethylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,2,3-Trimethylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
1,3,5-Trimethylbenzene	ND		0.00100	1	11/08/2018 04:40	WG1193134
Vinyl chloride	ND		0.00100	1	11/08/2018 04:40	WG1193134
Xylenes, Total	ND		0.00300	1	11/08/2018 04:40	WG1193134
(S) Toluene-d8	*98.6*		*80.0-120*		*11/08/2018 04:40*	WG1193134
(S) Dibromofluoromethane	*104*		*75.0-120*		*11/08/2018 04:40*	WG1193134
(S) 4-Bromofluorobenzene	*102*		*77.0-126*		*11/08/2018 04:40*	WG1193134

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Acenaphthene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Acenaphthylene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Benzo(a)anthracene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Benzo(a)pyrene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Benzo(b)fluoranthene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Benzo(g,h,i)perylene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Benzo(k)fluoranthene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Chrysene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Dibenz(a,h)anthracene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Fluoranthene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Fluorene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Naphthalene	0.000252		0.000250	1	11/09/2018 12:57	WG1193607
Phenanthrene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
Pyrene	ND		0.0000500	1	11/09/2018 12:57	WG1193607
1-Methylnaphthalene	ND		0.000250	1	11/09/2018 12:57	WG1193607
2-Methylnaphthalene	ND		0.000250	1	11/09/2018 12:57	WG1193607
2-Chloronaphthalene	ND		0.000250	1	11/09/2018 12:57	WG1193607
(S) Nitrobenzene-d5	*113*		*31.0-160*		*11/09/2018 12:57*	WG1193607
(S) 2-Fluorobiphenyl	*113*		*48.0-148*		*11/09/2018 12:57*	WG1193607
(S) p-Terphenyl-d14	*116*		*37.0-146*		*11/09/2018 12:57*	WG1193607

Method Blank (MB)

(MB) R3358962-1 11/09/18 20:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1041426-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1041426-01 11/09/18 20:15 • (DUP) R3358962-3 11/09/18 20:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	6150	6080	1	1.06		5

Laboratory Control Sample (LCS)

(LCS) R3358962-2 11/09/18 20:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8600	97.7	85.0-115	

Method Blank (MB)

(MB) R3359761-2 11/13/18 15:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Free Carbon Dioxide	U		6.67	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1042562-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1042562-01 11/13/18 19:45 • (DUP) R3359761-7 11/13/18 19:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
		mg/l		%		%
Free Carbon Dioxide		49.6	1	9.62		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

L1043084-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1043084-01 11/13/18 16:08 • (DUP) R3359761-4 11/13/18 16:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
		mg/l		%		%
Free Carbon Dioxide		ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

Method Blank (MB)

(MB) R3358468-1 11/09/18 12:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chromium,Hexavalent	U		0.00300	0.0100

L1042588-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1042588-01 11/09/18 12:20 • (DUP) R3358468-5 11/09/18 12:20

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3358468-2 11/09/18 12:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	0.600	0.587	97.8	80.0-120	

L1042067-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042067-01 11/09/18 12:19 • (MS) R3358468-3 11/09/18 12:20 • (MSD) R3358468-4 11/09/18 12:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	0.500	ND	0.516	0.519	103	104	1	85.0-115			0.580	20

Method Blank (MB)

(MB) R3359130-1 11/10/18 09:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

Laboratory Control Sample (LCS)

(LCS) R3359130-2 11/10/18 09:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.3	101	80.0-120	
Sulfate	40.0	40.6	102	80.0-120	

Method Blank (MB)

(MB) R3359197-1 11/12/18 18:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000490	0.000200

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

(LCS) R3359197-2 11/12/18 18:32 • (LCSD) R3359197-3 11/12/18 18:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	0.00289	0.00279	96.2	93.0	80.0-120			3.33	20

L1043195-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043195-09 11/12/18 18:36 • (MS) R3359197-4 11/12/18 18:39 • (MSD) R3359197-5 11/12/18 18:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	U	0.00285	0.00283	95.1	94.3	1	75.0-125			0.824	20

Method Blank (MB)

(MB) R3359553-1 11/13/18 13:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic,Dissolved	U		0.00650	0.0100
Barium,Dissolved	U		0.00170	0.00500
Boron,Dissolved	U		0.0126	0.200
Chromium,Dissolved	U		0.00140	0.0100
Copper,Dissolved	U		0.00530	0.0100
Lead,Dissolved	U		0.00190	0.00500
Nickel,Dissolved	U		0.00490	0.0100
Selenium,Dissolved	U		0.00740	0.0100
Silver,Dissolved	U		0.00280	0.00500
Zinc,Dissolved	U		0.00590	0.0500

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

(LCS) R3359553-2 11/13/18 13:32 • (LCSD) R3359553-3 11/13/18 13:35

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	0.995	0.995	99.5	99.5	80.0-120			0.0608	20
Barium,Dissolved	1.00	1.02	1.02	102	102	80.0-120			0.579	20
Boron,Dissolved	1.00	0.987	0.998	98.7	99.8	80.0-120			1.17	20
Chromium,Dissolved	1.00	0.996	0.991	99.6	99.1	80.0-120			0.524	20
Copper,Dissolved	1.00	0.982	0.981	98.2	98.1	80.0-120			0.105	20
Lead,Dissolved	1.00	0.999	0.991	99.9	99.1	80.0-120			0.818	20
Nickel,Dissolved	1.00	0.996	0.992	99.6	99.2	80.0-120			0.332	20
Selenium,Dissolved	1.00	0.989	0.978	98.9	97.8	80.0-120			1.15	20
Silver,Dissolved	0.200	0.183	0.184	91.7	92.0	80.0-120			0.368	20
Zinc,Dissolved	1.00	0.984	0.981	98.4	98.1	80.0-120			0.245	20

L1042501-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042501-08 11/13/18 13:37 • (MS) R3359553-5 11/13/18 13:43 • (MSD) R3359553-6 11/13/18 13:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	ND	1.02	1.03	101	102	1	75.0-125			1.08	20
Barium,Dissolved	1.00	0.107	1.11	1.12	100	101	1	75.0-125			0.666	20
Boron,Dissolved	1.00	ND	1.13	1.13	99.1	99.3	1	75.0-125			0.152	20
Chromium,Dissolved	1.00	ND	0.982	0.997	98.2	99.7	1	75.0-125			1.53	20
Copper,Dissolved	1.00	ND	0.982	0.995	98.2	99.5	1	75.0-125			1.30	20
Lead,Dissolved	1.00	ND	0.997	0.999	99.7	99.9	1	75.0-125			0.212	20
Nickel,Dissolved	1.00	ND	0.994	0.998	99.4	99.8	1	75.0-125			0.420	20

L1042501-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042501-08 11/13/18 13:37 • (MS) R3359553-5 11/13/18 13:43 • (MSD) R3359553-6 11/13/18 13:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium,Dissolved	1.00	ND	1.02	1.03	102	103	1	75.0-125			0.558	20
Silver,Dissolved	0.200	ND	0.187	0.188	93.7	94.2	1	75.0-125			0.537	20
Zinc,Dissolved	1.00	ND	0.967	0.976	96.7	97.6	1	75.0-125			0.840	20

Method Blank (MB)

(MB) R3359164-1 11/12/18 13:20

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Chromium	U		0.00140	0.0100

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

(LCS) R3359164-2 11/12/18 13:22 • (LCSD) R3359164-3 11/12/18 13:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Chromium	1.00	0.997	0.993	99.7	99.3	80.0-120			0.427	20

L1042726-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042726-07 11/12/18 13:27 • (MS) R3359164-5 11/12/18 13:33 • (MSD) R3359164-6 11/12/18 13:35

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chromium	1.00	ND	1.04	1.01	104	101	1	75.0-125			3.51	20

Method Blank (MB)

(MB) R3358461-1 11/09/18 10:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130

L1042223-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1042223-01 11/09/18 10:44 • (DUP) R3358461-2 11/09/18 11:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	ND	0.000	1	0.000		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20

L1041736-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1041736-11 11/09/18 11:14 • (DUP) R3358461-3 11/09/18 11:41

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	U	0.000	1	0.000		20
Ethane	U	0.000	1	0.000		20
Ethene	U	0.000	1	0.000		20

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

(LCS) R3358461-4 11/09/18 11:44 • (LCSD) R3358461-5 11/09/18 11:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0721	0.0736	106	109	85.0-115			2.11	20
Ethane	0.129	0.115	0.118	88.9	91.1	85.0-115			2.46	20
Ethene	0.127	0.114	0.114	89.8	90.0	85.0-115			0.168	20

Method Blank (MB)

(MB) R3358052-3 11/07/18 21:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	0.0500
Acrylonitrile	U		0.00187	0.0100
Acrolein	U		0.00887	0.0500
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00100
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100

Method Blank (MB)

(MB) R3358052-3 11/07/18 21:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000412	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*95.2*			*80.0-120*
(S) Dibromofluoromethane	*103*			*75.0-120*
(S) 4-Bromofluorobenzene	*103*			*77.0-126*

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

(LCS) R3358052-1 11/07/18 20:41 • (LCSD) R3358052-2 11/07/18 21:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0955	0.125	76.4	99.8	19.0-160			26.6	27
Acrylonitrile	0.125	0.132	0.137	106	110	55.0-149			3.81	20
Benzene	0.0250	0.0285	0.0287	114	115	70.0-123			0.759	20
Bromobenzene	0.0250	0.0271	0.0279	108	111	73.0-121			2.79	20

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

(LCS) R3358052-1 11/07/18 20:41 • (LCSD) R3358052-2 11/07/18 21:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromodichloromethane	0.0250	0.0270	0.0275	108	110	75.0-120			1.85	20
Bromoform	0.0250	0.0257	0.0272	103	109	68.0-132			5.45	20
Bromomethane	0.0250	0.0250	0.0226	99.9	90.4	10.0-160			10.1	25
n-Butylbenzene	0.0250	0.0279	0.0287	111	115	73.0-125			3.03	20
sec-Butylbenzene	0.0250	0.0264	0.0279	106	112	75.0-125			5.57	20
tert-Butylbenzene	0.0250	0.0261	0.0271	104	108	76.0-124			3.79	20
Carbon tetrachloride	0.0250	0.0268	0.0264	107	106	68.0-126			1.55	20
Chlorobenzene	0.0250	0.0252	0.0254	101	102	80.0-121			0.708	20
Chlorodibromomethane	0.0250	0.0254	0.0254	102	102	77.0-125			0.0912	20
Chloroethane	0.0250	0.0227	0.0247	90.9	98.8	47.0-150			8.28	20
Chloroform	0.0250	0.0274	0.0278	109	111	73.0-120			1.58	20
Chloromethane	0.0250	0.0201	0.0208	80.5	83.1	41.0-142			3.16	20
2-Chlorotoluene	0.0250	0.0262	0.0270	105	108	76.0-123			3.12	20
4-Chlorotoluene	0.0250	0.0267	0.0285	107	114	75.0-122			6.50	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0228	0.0243	91.4	97.2	58.0-134			6.17	20
1,2-Dibromoethane	0.0250	0.0239	0.0243	95.7	97.1	80.0-122			1.46	20
Dibromomethane	0.0250	0.0281	0.0291	112	116	80.0-120			3.52	20
1,2-Dichlorobenzene	0.0250	0.0255	0.0275	102	110	79.0-121			7.68	20
1,3-Dichlorobenzene	0.0250	0.0268	0.0286	107	115	79.0-120			6.42	20
1,4-Dichlorobenzene	0.0250	0.0251	0.0259	100	104	79.0-120			3.20	20
Dichlorodifluoromethane	0.0250	0.0244	0.0256	97.6	102	51.0-149			4.82	20
1,1-Dichloroethane	0.0250	0.0284	0.0294	114	118	70.0-126			3.52	20
1,2-Dichloroethane	0.0250	0.0278	0.0284	111	114	70.0-128			2.35	20
1,1-Dichloroethene	0.0250	0.0266	0.0265	107	106	71.0-124			0.308	20
cis-1,2-Dichloroethene	0.0250	0.0274	0.0273	110	109	73.0-120			0.257	20
trans-1,2-Dichloroethene	0.0250	0.0273	0.0274	109	110	73.0-120			0.194	20
1,2-Dichloropropane	0.0250	0.0276	0.0287	111	115	77.0-125			3.81	20
1,1-Dichloropropene	0.0250	0.0311	0.0315	124	126	74.0-126			1.42	20
1,3-Dichloropropane	0.0250	0.0266	0.0271	106	108	80.0-120			1.86	20
cis-1,3-Dichloropropene	0.0250	0.0272	0.0276	109	111	80.0-123			1.55	20
trans-1,3-Dichloropropene	0.0250	0.0268	0.0279	107	111	78.0-124			3.79	20
2,2-Dichloropropane	0.0250	0.0385	0.0400	154	160	58.0-130	J4	J4	3.77	20
Di-isopropyl ether	0.0250	0.0224	0.0230	89.4	91.9	58.0-138			2.75	20
Ethylbenzene	0.0250	0.0256	0.0257	102	103	79.0-123			0.558	20
Hexachloro-1,3-butadiene	0.0250	0.0265	0.0284	106	114	54.0-138			6.70	20
Isopropylbenzene	0.0250	0.0269	0.0277	108	111	76.0-127			2.67	20
p-Isopropyltoluene	0.0250	0.0263	0.0275	105	110	76.0-125			4.62	20
2-Butanone (MEK)	0.125	0.132	0.138	105	111	44.0-160			5.11	20
Acrolein	0.125	0.201	0.209	161	167	10.0-160	J4	J4	4.09	26
Methylene Chloride	0.0250	0.0256	0.0270	102	108	67.0-120			5.18	20

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

(LCS) R3358052-1 11/07/18 20:41 • (LCSD) R3358052-2 11/07/18 21:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	0.125	0.121	0.123	96.8	98.7	68.0-142			1.90	20
Methyl tert-butyl ether	0.0250	0.0201	0.0211	80.4	84.2	68.0-125			4.63	20
Naphthalene	0.0250	0.0211	0.0229	84.4	91.7	54.0-135			8.27	20
n-Propylbenzene	0.0250	0.0270	0.0282	108	113	77.0-124			4.31	20
Styrene	0.0250	0.0256	0.0264	102	106	73.0-130			3.37	20
1,1,1,2-Tetrachloroethane	0.0250	0.0247	0.0260	98.9	104	75.0-125			4.94	20
1,1,2,2-Tetrachloroethane	0.0250	0.0257	0.0275	103	110	65.0-130			7.01	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0249	0.0261	99.8	105	69.0-132			4.62	20
Tetrachloroethene	0.0250	0.0270	0.0277	108	111	72.0-132			2.36	20
Toluene	0.0250	0.0263	0.0267	105	107	79.0-120			1.82	20
1,2,3-Trichlorobenzene	0.0250	0.0216	0.0247	86.3	98.9	50.0-138			13.7	20
1,2,4-Trichlorobenzene	0.0250	0.0243	0.0268	97.3	107	57.0-137			9.79	20
1,1,1-Trichloroethane	0.0250	0.0274	0.0264	110	106	73.0-124			3.61	20
1,1,2-Trichloroethane	0.0250	0.0246	0.0245	98.4	98.0	80.0-120			0.354	20
Trichloroethene	0.0250	0.0248	0.0263	99.1	105	78.0-124			6.10	20
Trichlorofluoromethane	0.0250	0.0254	0.0279	101	112	59.0-147			9.59	20
1,2,3-Trichloropropane	0.0250	0.0244	0.0253	97.8	101	73.0-130			3.45	20
1,2,4-Trimethylbenzene	0.0250	0.0261	0.0266	105	107	76.0-121			1.89	20
1,2,3-Trimethylbenzene	0.0250	0.0250	0.0264	100	105	77.0-120			5.22	20
1,3,5-Trimethylbenzene	0.0250	0.0262	0.0269	105	108	76.0-122			2.68	20
Vinyl chloride	0.0250	0.0272	0.0260	109	104	67.0-131			4.50	20
Xylenes, Total	0.0750	0.0782	0.0799	104	107	79.0-123			2.15	20
(S) Toluene-d8				*99.3*	*97.9*	*80.0-120*				
(S) Dibromofluoromethane				*102*	*102*	*75.0-120*				
(S) 4-Bromofluorobenzene				*99.3*	*105*	*77.0-126*				

Method Blank (MB)

(MB) R3358512-3 11/09/18 06:20

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Anthracene	U		0.0000140	0.0000500
Acenaphthene	U		0.0000100	0.0000500
Acenaphthylene	U		0.0000120	0.0000500
Benzo(a)anthracene	U		0.00000410	0.0000500
Benzo(a)pyrene	U		0.0000116	0.0000500
Benzo(b)fluoranthene	U		0.00000212	0.0000500
Benzo(g,h,i)perylene	U		0.00000227	0.0000500
Benzo(k)fluoranthene	U		0.0000136	0.0000500
Chrysene	U		0.0000108	0.0000500
Dibenz(a,h)anthracene	U		0.00000396	0.0000500
Fluoranthene	U		0.0000157	0.0000500
Fluorene	U		0.00000850	0.0000500
Indeno(1,2,3-cd)pyrene	U		0.0000148	0.0000500
Naphthalene	U		0.0000198	0.000250
Phenanthrene	U		0.00000820	0.0000500
Pyrene	U		0.0000117	0.0000500
1-Methylnaphthalene	U		0.00000821	0.000250
2-Methylnaphthalene	U		0.00000902	0.000250
2-Chloronaphthalene	U		0.00000647	0.000250
(S) Nitrobenzene-d5	*113*			*31.0-160*
(S) 2-Fluorobiphenyl	*110*			*48.0-148*
(S) p-Terphenyl-d14	*116*			*37.0-146*

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

(LCS) R3358512-1 11/09/18 05:36 • (LCSD) R3358512-2 11/09/18 05:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.00200	0.00216	0.00216	108	108	67.0-150			0.000	20
Acenaphthene	0.00200	0.00216	0.00211	108	105	65.0-138			2.34	20
Acenaphthylene	0.00200	0.00227	0.00221	114	111	66.0-140			2.68	20
Benzo(a)anthracene	0.00200	0.00218	0.00213	109	106	61.0-140			2.32	20
Benzo(a)pyrene	0.00200	0.00214	0.00208	107	104	60.0-143			2.84	20
Benzo(b)fluoranthene	0.00200	0.00197	0.00202	98.5	101	58.0-141			2.51	20
Benzo(g,h,i)perylene	0.00200	0.00228	0.00225	114	112	52.0-153			1.32	20
Benzo(k)fluoranthene	0.00200	0.00214	0.00202	107	101	58.0-148			5.77	20
Chrysene	0.00200	0.00211	0.00207	105	104	64.0-144			1.91	20
Dibenz(a,h)anthracene	0.00200	0.00214	0.00212	107	106	52.0-155			0.939	20
Fluoranthene	0.00200	0.00225	0.00224	112	112	69.0-153			0.445	20

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

(LCS) R3358512-1 11/09/18 05:36 • (LCSD) R3358512-2 11/09/18 05:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.00200	0.00217	0.00211	108	105	64.0-136			2.80	20
Indeno(1,2,3-cd)pyrene	0.00200	0.00223	0.00220	111	110	54.0-153			1.35	20
Naphthalene	0.00200	0.00209	0.00205	104	103	61.0-137			1.93	20
Phenanthrene	0.00200	0.00204	0.00199	102	99.5	62.0-137			2.48	20
Pyrene	0.00200	0.00212	0.00207	106	104	60.0-142			2.39	20
1-Methylnaphthalene	0.00200	0.00217	0.00214	108	107	66.0-142			1.39	20
2-Methylnaphthalene	0.00200	0.00197	0.00195	98.5	97.5	62.0-136			1.02	20
2-Chloronaphthalene	0.00200	0.00222	0.00215	111	107	64.0-140			3.20	20
(S) Nitrobenzene-d5				*116*	*115*	*31.0-160*				
(S) 2-Fluorobiphenyl				*110*	*106*	*48.0-148*				
(S) p-Terphenyl-d14				*116*	*114*	*37.0-146*				

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
J4	The associated batch QC was outside the established quality control range for accuracy.
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

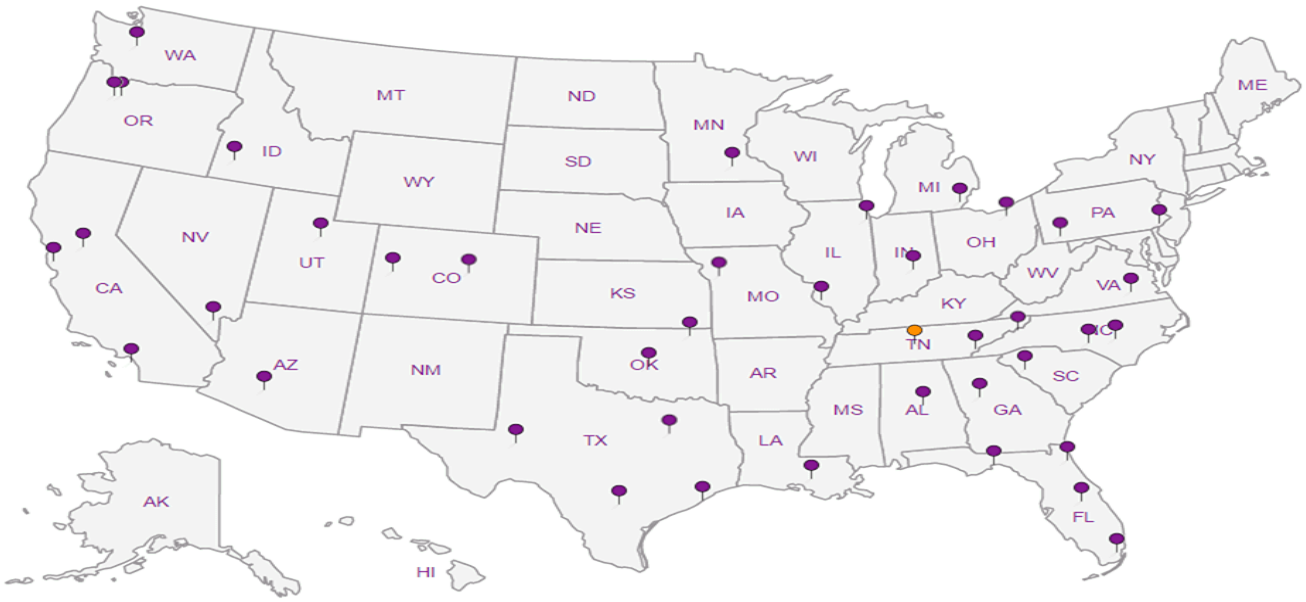
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Terracon-Longmont
12831 Lefthand Circle, Suite C
Longmont, CO 80501

Billing Information: **Same as Address**

Report to: **Mike Skridulis**

Email To: **mike.skridulis@terracon.com**

Project Description: **Future KNight O&G Well Site**

City/State Collected: **Longmont, CO**

Phone: **303-454-5249**
Fax: **970-484-0454**

Client Project # **22187033**

Lab Project #

Collected by (print): **Charles A. Covington**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC8260 (2) 40ml Amber w/ HCl	Diss. Methane , Ethane, ethene (2) 4ml	CO2-125ml HDPE no pres.	Diss. metals-250ml HDPE no pres.	PAHSIM(2) 40ml Amber no pres.	Cl, SO4, TDS-250ml HDPE no pres.	Remarks	Sample # (lab only)
MW-03		GW		11/2/2018	1325	9	X	X	X	X	X	X		

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L1042062
D132

Acctnum: **TERRALCO**
Template:
Prelogin:
TSR: **Daphne Richards**
PB:
Shipped Via:

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

Remarks: RAD SCREEN: 0.0 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.2 °C Bottles Received: 9
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Mollie Tisdale	Date: 11/7 Time: 8:45

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: TERRACON	SDG#	L1042067
Cooler Received/Opened On: 11/7/18	Temperature:	0.4
Received By: Malik Tisdale		
Signature: Malik Tisdale		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?			
Bottles arrive intact?			
Correct bottles used?			
Sufficient volume sent?			
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			