Background

X4JH2000 is a high-performance bio-stimulate that effectively accelerates petroleum hydrocarbon remediation in a fraction of the time and costs of the market's leading bio-remedial brands. X4JH2000 is a concentrated synergistic blend of synthetic, bio-degradable, non-toxic, non-flammable surfactants and select nutrients that stimulate and energize indigenous bacteria. When diluted with fresh water, or salt water, the solution is capable of breaking down hydrocarbon masses into microscopic spheres or droplets upon contact by spraying or mixing. These droplets become tightly suspended in solution and remain stable in the rinse and treated media. Noticeable evidence of this action is an immediate change in the color of the oily media, as well as reduction / elimination of hydrocarbon odors.

The bio-stimulate was analyzed by Bio-Aquatic Testing, Inc. in August 2008, and was shown to be environmentally safe for use within sensitive aquatic ecosystems based on United States Environmental ProX4 Environmentaltion Agency (EPA) LC_{50} calculations. LC_{50} is the concentration of a substance that is lethal to 50% of the organisms exposed to it in a toxicity test. It is a useful tool as it can predict the effects of a potential toxin in aquaculture systems. Additionally, stimulation of indigenous grasses and aquatic vegetation has been shown to occur in the

vicinity of surface soils and/or surface water under remediation using X4JH2000. Furthermore, X4JH2000 has met all criteria set forth by the EPA under 40 CFR 300.920.e Part J, and is listed in the EPA National Contingency Plan (NCP) Product Schedule.

X4 ENVIRONMENTAL successfully utilized X4JH2000 to remediate surface soils, surface water, waste water, and surface impoundments impacted with petroleum hydrocarbons in the lands and waters of the United States, Canada, Mexico, Russia, Brazil, Ecuador, Nigeria, China, United Arab Emirates, Oman, and Kuwait. Additionally, the product was used to clean equipment, degas storage tanks, provide odor control, and act as a fire retardant.

Types of Bio-Remediation

The main types of bio-remediation are Intrinsic Bio-Remediation, Bio-Augmentation, and Bio-Stimulation. A summary of each type is provided below:

Intrinsic bio-remediation, also known as natural attenuation, occurs naturally in contaminated soil or water. This natural bio-remediation is the work of micro-organisms and is seen at sites historically impacted by petroleum hydrocarbons. Researchers are studying whether intrinsic bio-remediation occurs in areas with other types of chemical contamination. Application of this X4 Environmentalhnique requires close monitoring of contaminant degradation to ensure the environment and human health are proX4 Environmentalted. Bio-remediation can be used at the site of contamination (in situ) or on contamination removed from the original site (ex situ). In the case of contaminated soils, sediments, and sludges, it can involve land tilling in order to incorporate oxygen and nutrients more accessible to the indigenous microorganisms.

Bio-augmentation occurs when micro-organisms, capable of remediating particular contaminants, are added to the contaminated soil and/or water. Bio-augmentation is more commonly and successfully used on contaminants removed from the original site, such as in municipal wastewater treatment facilities. To date, this method has not been very successful when done at the site of the contamination because it is difficult to control site conditions for the optimal growth of the micro-organisms added. Scientists have yet to completely understand all the mechanisms involved in bio-remediation, and organisms introduced into a foreign environment may have a hard time surviving.

Bio-stimulation occurs when oxygen and nutrients are added to contaminated soil and /or water to encourage growth and activity of bacteria already existing at the impacted site. The degradation and disappearance of contaminants are monitored over time to ensure remediation occurs.

Bio-Remediation Performance Variables

Several performance variables were identified prior to conducting the bio-remediation pilot tests, including indigenous microbial communities and ecosystems, energy sources, nutrients, oxygen, temperature, and pH.

Bio-remediation can be defined as any process that uses micro-organisms or their enzymes to return the environment altered by contaminants to its original condition. Bio-remediation may be employed in order to attack specific contaminants that are degraded by bacteria, or a more general approach may be taken, such as oil spills that are broken down using multiple X4 Environmentalhniques including the addition of fertilizers to facilitate the decomposition of crude oil by bacteria.

Every organism must find in its environment all of the substances required for energy generation and cellular bio-synthesis. The chemicals and elements are utilized for bacterial growth are referred to as nutrients or ***nutritional requirements***. In order to grow in nature, a bacterium must have an energy source, a source of carbon and other required nutrients, and a permissive range of physical conditions such as oxygen, temperature, and pH. Sometimes bacteria are referred to as individuals or groups based on their patterns of growth under various chemical (nutritional) or physical conditions.

It is possible to define the causes of time - dependent changes in the health of a stressed ecosystem on the basis of the structural composition of the ecosystem population. Microbial communities within contaminated ecosystems tend to be dominated by those organisms capable of utilizing and / or surviving toxic contamination. As a result, these communities are typically less diverse than those in non-stressed systems, although the diversity may be influenced by the complexity of chemical mixtures present, and the length of time the populations have been exposed.

Bio-remediation of petroleum hydrocarbon impacted soils is primarily accomplished by providing ***sufficient oxygen*** to the indigenous microbes, thus accelerating aerobic bio-degradation of the contaminants into byproducts of carbon dioxide and water. The availability of oxygen is commonly the limiting factor in bio-degradation of petroleum hydrocarbons and other contaminants in impacted soils. Active contaminant degrading microbial populations are commonly present in surface and subsurface soils, as are sufficient quantities of nutrients (nitrogen, phosphorous). However, the absence of sufficient oxygen supply causes the subsurface environment to become anoxic, and causes microbes to function in a less efficient anaerobic manner. When oxygen is added to the surface and subsurface impacted soils,

heterotrophic bacteria will convert from anaerobic to aerobic metabolism, and more efficiently and quickly degrade the petroleum hydrocarbons.

Preliminary Bio-Remediation Pilot Tests Activities

GEP personnel conducted preliminary bio-remediation pilot tests using X4JH2000 during the period September 17 - 20, 2016 and October 7 - 12, 2016 and identified critical performance variables necessary to optimize in situ bio-remediation of surface soils impacted with petroleum hydrocarbons. The pilot tests focused on diesel and crude oil spills followed by active bio-remediation.

Bio-cells were prepared in advance using an excavator to remove ground cover and small obstructions, and a garden tiller to break down surface soils into manageable units. Each bio-cell was approximately 55 feet long, five (5) feet wide, and one (1) foot in depth (approximately ten [10] cubic yards - see **Photograph 1**). Following preparations of the bio-cells, approximately 20 gallons each of diesel fuel and fresh West Texas crude oil were evenly distributed to their respective bio-cells and thoroughly mixed into the surface soils to a depth of approximately one (1) foot below grade using a garden tiller (a ratio of 1.0 gallon spill to 0.5 cubic yard impacted surface soils).

Pre-treated soil samples were collected from each bio-cell (diesel and crude oil) and analyzed in the field for their respective constituent(s) using a portable Total Petroleum Hydrocarbons (TPH) analyzer provided by Hanby Environmental of Houston, Texas. Diesel and crude oil constituent concentrations were obtained in the field within five (5) minuets upon sample collection via TPH colorimetric scale with associated constituent concentrations.

Following collection of the pre-treated soil samples, one (1) gallon of X4JH2000 concentrate was thoroughly mixed with ten (10) gallons of bacteria-laden water for each cubic yard of petroleum hydrocarbon impacted surface soils. Therefore, approximately 110 gallons of bio-solution were spray-applied to each bio-cell and thoroughly mixed into the impacted surface soils using a garden tiller (see **Photograph 2**).

Soil amendments (nutrients - hay, peat moss, and organic-rich / moisture-retaining soil) were added to each bio-cell to facilitate bio-activity, and bio-degradation of the petroleum hydrocarbon contaminants. Additionally, the moisture content in each bio-cell was maintained though applications of bacteria-laden water. Furthermore, each bio-cell was aerated every two (2) to four (4) hours using a garden tiller to ensure adequate or sufficient levels of oxygen to maintain the desired bio-activity.

Treated soil samples were collected every six (6) hours during the first day and every 12 hours during the second and third day, and analyzed in the field to monitor the progress of the pilot test. The preliminary pilot test was conducted over a three-day / 72-hour period. The preliminary field TPH results were compared with the documented field bio-remediation activities to identify the optimum performance variables to effect bio-remediation of the organic contaminants.

Enhanced Bio-Remediation Pilot Test Activities

Following an evaluation of the preliminary field results, GEP personnel conducted an enhanced pilot test during the period October 25, 2016 through November 1, 2016 using the optimum performance variables previously identified to effect accelerated in situ bio-remediation.

New bio-cells were prepared in advance using a garden tiller to break down surface soils into manageable units. Each bio-cell was approximately nine (9) feet long, three (3) feet wide, and 0.5 foot in depth (approximately 0.5 cubic yards). Following preparations of the bio-cells, approximately 10 gallons each of diesel fuel and fresh West Texas crude oil were evenly distributed to their respective bio-cells and thoroughly mixed into the surface soils to a depth of approximately 0.5 foot below grade using a garden tiller (a ratio of 1.0 gallon spill to 0.05 cubic yard impacted surface soils).

Pre-treated soil samples were collected from each bio-cell (diesel and crude oil), placed in laboratory - supplied sample containers, and preserved on ice pending laboratory analysis. Following collection of the pre-treated soil samples, 0.5 gallon of X4JH2000 concentrate was thoroughly mixed with five (5) gallons of bacteria-laden water for each 0.5 cubic yard of petroleum hydrocarbon impacted surface soils. Therefore, approximately 5.5 gallons of bio-solution were spray-applied to each bio-cell and thoroughly mixed into the impacted surface soils using a garden tiller.

Soil amendments (nutrients - organic-rich / moisture-retaining soil and cow manure) were added to each bio-cell to facilitate bio-activity, and bio-degradation of the petroleum hydrocarbon contaminants. Additionally, the moisture content in each bio-cell was maintained though applications of bacteria-laden water. Furthermore, each bio-cell was aerated every two (2) to four (4) hours using a garden tiller to ensure adequate or sufficient levels of oxygen to maintain the desired bio-activity.

Treated soil samples were collected every 24 hours over a seven (7) - day / 168 - hour treatment period, placed in laboratory - supplied sample containers, and preserved on ice pending laboratory analysis. The pre-treated and treated soil samples were submitted to Pace

Analytical Services, LLC of St. Rose, Louisiana under strict Chain-of-Custody procedures and analyzed for diesel and crude oil TPHs using Environmental ProX4 Environmentaltion Agency (EPA) Method 8015B Modified.

Enhanced Bio-Remediation Pilot Test Analytical Laboratory Results

The analytical laboratory data from the enhanced bio-remediation pilot test revealed the following results:

- ***Diesel (C_{10}-C_{28})*** constituent concentrations were reduced from 110,000 milligrams per kilogram (mg/kg) to 12,000 mg/kg following seven (7) days of treatment ***(89% reduction)***.

- ***TPH - Crude Oil*** **(C_6-C_{40})** constituent concentrations were reduced from 119,700 mg/kg to 19,148 mg/kg following seven (7) days of treatment ***(84% reduction)***.

    - ***TPH - Gasoline (C_6-C_{10})*** constituent concentrations were reduced from 11,400 mg/kg to 883 mg/kg following seven (7) days of treatment ***(92% reduction)***.

    - ***TPH - Diesel (C_{10}-C_{28})*** constituent concentrations were reduced from 84,300 mg/kg to 14,000 mg/kg following seven (7) days of treatment ***(83% reduction)***.

    - ***TPH - Oil (C_{28}-C_{40})*** constituent concentrations were reduced from 24,000 mg/kg to 4,265 mg/kg following seven (7) days of treatment ***(82% reduction)***.

A summary of the soil sample analytical laboratory results is presented in **Table 1**. The analytical laboratory reports are included in **Appendix A**.

GulfEarth Partners, LLC appreciates the opportunity to provide X4 Environmental, LLC with this report.

Your very truly,

Peter T. Smith, PG, CHMM

Photograph 1

Photograph 2

Table 1

TABLE 1

ENHANCED BIO-REMEDIAL X4
ENVIRONMENTALHNIQUE
SOIL SAMPLE ANALYTICAL LABORATORY SUMMARY

Soil Sample ID	Soil Sample Collection Date	Soils Impacted With Diesel	Soils Impacted With Crude Oil			
		TPH-Diesel C_{10}-C_{28} (mg/kg)	TPH-Gasoline C_6-C_{10} (mg/kg)	TPH-Diesel C_{10}-C_{28} (mg/kg)	TPH-Oil C_{28}-C_{40} (mg/kg)	TPHs C_6-C_{40} (mg/kg)
Pre-Treated	10/25/16	110,000	11,400	84,300	24,000	119,700
24 - Hour (1 - Day) Treated	10/26/16	51,300 (53%) (>50%)	6,230 (45%)	36,800 (56%) (>50%)	13,500 (44%)	56,530 (53%) (>50%)
48 - Hour (2 - Day) Treated	10/27/16	43,500 (60%)	4,710 (59%) (>50%)	31,800 (62%)	11,400 (53%) (>50%)	47,910 (60%)
72 - Hour (3 - Day) Treated	10/28/16	38,000 (65%)	4,060 (64%)	22,300 (74%)	9,190 (62%)	35,550 (71%)
120 - Hour (5 - Day) Treated	10/30/16	35,100 (68%)	2,600 (77%) (>75%)	20,600 (76%) (>75%)	8,530 (64%)	31,730 (73%)
168 - Hour (7 - Day) Treated	11/01/16	12,000 (89%) (>75%)	883 (92%)	14,000 (83%)	ND<4,265 (82%) (>75%)	19,148 (84%) (>75%)
Total Percent Decrease in Concentrations During 7-Day Treatment Event		89%	92%	83%	82%	84%

Notes:

mg/kg - milligrams per kilogram / parts per million

Diesel and crude oil bio-treatment cells were prepared in advance using an organic soil base consisting of approximately 80% organic soil, 15% potting soil, and 5% cow manure and were thoroughly mixed.

A bio-solution using one part X4JH2000 with ten parts fresh lake water was prepared and applied to each bio-treatment cell and was thoroughly mixed to ensure adequate cell hydration.

A small volume of cow manure, with bio-solution necessary to maintain hydration and organic enhancement, were applied to each bio-treatment cell daily throughout this event.

Appendix A

Analytical Laboratory Reports

Pace Analytical Services, LLC
1000 Riverbend Blvd - Suite F
St. Rose, LA 70087
(504)469-0333

November 04, 2016

Peter Smith
Gulf Earth Partners
7200 Cypress Lakes Apt Blvd
Baton Rouge, LA 70809

RE: Project: Soil Sampling
Pace Project No.: 2045170

Dear Peter Smith:
Enclosed are the analytical results for sample(s) received by the laboratory on November 02, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melissa MacNaughton

Melissa MacNaughton
Melissa.MacNaughton@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, LLC
1000 Riverbend Blvd - Suite F
St. Rose, LA 70087
(504)469-0333

CERTIFICATIONS

Project: Soil Sampling
Pace Project No.: 2045170

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA
Florida Department of Health (NELAC): E87595
Illinois Environmental ProX4 Environmentaltion Agency: 0025721
Kansas Department of Health and Environment (NELAC): E-10266
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006
Pennsylvania Dept. of Env ProX4 Environmentaltion (NELAC): 68-04202Texas Commission on Env. Quality (NELAC): T104704405-09-TX
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119
Commonwealth of Virginia (TNI): 480246

REPORT OF LABORATORY ANALYSIS

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St. Rose, LA 70087
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SAMPLE SUMMARY

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2045170001	**OIL PRETREATMENT**	Solid	10/25/16 20:00	11/02/16 14:45
2045170002	**DIESEL-1 PRETREATMENT**	Solid	10/25/16 20:00	11/02/16 14:45
2045170003	**OIL 48-HOUR TREATED**	Solid	10/27/16 20:00	11/02/16 14:45
2045170004	**DIESEL-1 48-HOUR TREATED**	Solid	10/27/16 20:00	11/02/16 14:45
2045170005	**OIL 7-DAY TREATED**	Solid	11/01/16 20:00	11/02/16 14:45
2045170006	**DIESEL-1 7-DAY TREATED**	Solid	11/01/16 20:00	11/02/16 14:45

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SAMPLE ANALYTE COUNT

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2045170001	**OIL PRETREATMENT**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170002	**DIESEL-1 PRETREATMENT**	EPA 8015B Modified	ARW	3
2045170003	**OIL 48-HOUR TREATED**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170004	**DIESEL-1 48-HOUR TREATED**	EPA 8015B Modified	ARW	3
2045170005	**OIL 7-DAY TREATED**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170006	**DIESEL-1 7-DAY TREATED**	EPA 8015B Modified	ARW	3

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015B Modified**
Description: 8015M DRO/ORO Organics
Client: Gulf Earth Partners
Date: November 04, 2016

General Information:
6 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 66886

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- DIESEL-1 48-HOUR TREATED (Lab ID: 2045170004)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- DIESEL-1 7-DAY TREATED (Lab ID: 2045170006)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- DIESEL-1 PRETREATMENT (Lab ID: 2045170002)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MS (Lab ID: 278314)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MSD (Lab ID: 278315)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL 48-HOUR TREATED (Lab ID: 2045170003)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL 7-DAY TREATED (Lab ID: 2045170005)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL PRETREATMENT (Lab ID: 2045170001)
  - n-Pentacosane (S)
  - o-Terphenyl (S)

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015B Modified**
Description: 8015M DRO/ORO Organics
Client: Gulf Earth Partners
Date: November 04, 2016

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 66886

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- DIESEL-1 7-DAY TREATED (Lab ID: 2045170006)
  - Diesel Range Organic (C10-C28)

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015/8021**
Description: 8021 GCV BTEX, MTBE, GRO Med L
Client: Gulf Earth Partners
Date: November 04, 2016

General Information:
3 samples were analyzed for EPA 8015/8021. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: OIL PRETREATMENT **Lab ID: 2045170001** Collected: 10/25/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**84300**	mg/kg	996	20	11/02/16 16:13	11/03/16 11:03		M6
Oil Range Organics (>C28-C40)	**24000**	mg/kg	4980	20	11/02/16 16:13	11/03/16 11:03		
Surrogates								
o-Terphenyl (S)	27600	%.	16-127	20	11/02/16 16:13	11/03/16 11:03	84-15-1	S4
n-Pentacosane (S)	41200	%.	16-147	20	11/02/16 16:13	11/03/16 11:03	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**4710**	mg/kg	252	100	11/03/16 07:30	11/03/16 10:36		
Surrogates								
4-Bromofluorobenzene (S)	96	%.	44-148	100	11/03/16 07:30	11/03/16 10:36	460-00-4	

Sample: DIESEL-1 PRETREATMENT **Lab ID: 2045170002** Collected: 10/25/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**110000**	mg/kg	4900	100	11/02/16 16:13	11/03/16 16:07		
Surrogates								
o-Terphenyl (S)	70500	%.	16-127	100	11/02/16 16:13	11/03/16 16:07	84-15-1	S4
n-Pentacosane (S)	3210	%.	16-147	100	11/02/16 16:13	11/03/16 16:07	629-99-2	S4

Sample: OIL 48-HOUR TREATED **Lab ID: 2045170003** Collected: 10/27/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**31800**	mg/kg	978	100	11/02/16 16:13	11/03/16 16:35		
Oil Range Organics (>C28-C40)	**8530**	mg/kg	4890	100	11/02/16 16:13	11/03/16 16:35		
Surrogates								
o-Terphenyl (S)	11900	%.	16-127	100	11/02/16 16:13	11/03/16 16:35	84-15-1	S4
n-Pentacosane (S)	16300	%.	16-147	100	11/02/16 16:13	11/03/16 16:35	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**2600**	mg/kg	252	100	11/03/16 07:30	11/03/16 11:02		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	44-148	100	11/03/16 07:30	11/03/16 11:02	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: DIESEL-1 48-HOUR TREATED **Lab ID: 2045170004** Collected: 10/27/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**38000**	mg/kg	980	100	11/02/16 16:13	11/03/16 13:36		
Surrogates								
o-Terphenyl (S)	25900	%.	16-127	100	11/02/16 16:13	11/03/16 13:36	84-15-1	S4
n-Pentacosane (S)	1340	%.	16-147	100	11/02/16 16:13	11/03/16 13:36	629-99-2	S4

Sample: OIL 7-DAY TREATED **Lab ID: 2045170005** Collected: 11/01/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**14000**	mg/kg	4920	100	11/02/16 16:13	11/03/16 14:04		
Oil Range Organics (>C28-C40)	ND	mg/kg	24600	100	11/02/16 16:13	11/03/16 14:04		
Surrogates								
o-Terphenyl (S)	7130	%.	16-127	100	11/02/16 16:13	11/03/16 14:04	84-15-1	S4
n-Pentacosane (S)	7840	%.	16-147	100	11/02/16 16:13	11/03/16 14:04	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021		Preparation Method: EPA 5035A/5030B					
Gasoline Range Organics	**883**	mg/kg	46.8	20	11/03/16 07:30	11/03/16 12:09		
Surrogates								
4-Bromofluorobenzene (S)	104	%.	44-148	20	11/03/16 07:30	11/03/16 12:09	460-00-4	

Sample: DIESEL-1 7-DAY TREATED **Lab ID: 2045170006** Collected: 11/01/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**12000**	mg/kg	97.8	10	11/02/16 16:13	11/03/16 14:32		E
Surrogates								
o-Terphenyl (S)	6280	%.	16-127	10	11/02/16 16:13	11/03/16 14:32	84-15-1	S4
n-Pentacosane (S)	953	%.	16-147	10	11/02/16 16:13	11/03/16 14:32	629-99-2	S4

REPORT OF LABORATORY ANALYSIS

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1000 Riverbend Blvd - Suite F
St. Rose, LA 70087
(504)469-0333

QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 66906 Analysis Method: EPA 8015/8021
QC Batch Method: EPA 5035A/5030B Analysis Description: 8021 BTEX, MTBE, GRO Medium Level Soil
Associated Lab Samples: 2045170001, 2045170003, 2045170005

METHOD BLANK: 278362 Matrix: Solid
Associated Lab Samples: 2045170001, 2045170003, 2045170005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.5	11/03/16 09:44	
4-Bromofluorobenzene (S)	%.	94	44-148	11/03/16 09:44	

LABORATORY CONTROL SAMPLE: 278363

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	25	25.8	103	61-136	M4
4-Bromofluorobenzene (S)	%.			94	44-148	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 66886 Analysis Method: EPA 8015B Modified
QC Batch Method: EPA 3546 Analysis Description: EPA 8015 ORO
Associated Lab Samples: 2045170001, 2045170002, 2045170003, 2045170004, 2045170005, 2045170006

METHOD BLANK: 278312 Matrix: Solid
Associated Lab Samples: 2045170001, 2045170002, 2045170003, 2045170004, 2045170005, 2045170006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	ND	10.0	11/03/16 10:03	
Oil Range Organics (>C28-C40)	mg/kg	ND	50.0	11/03/16 10:03	
n-Pentacosane (S)	%.	88	16-147	11/03/16 10:03	
o-Terphenyl (S)	%.	78	16-127	11/03/16 10:03	

LABORATORY CONTROL SAMPLE: 278313

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	40	35.8	90	34-125	
n-Pentacosane (S)	%.			88	16-147	
o-Terphenyl (S)	%.			94	16-127	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 278314 278315

Parameter	Units	2045170001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Range Organic (C10-C28)	mg/kg	84300	37.3	38.9	127000	124000	115000	102000	10-163	3	20	M6
n-Pentacosane (S)	%.						90400	63700	16-147			S4
o-Terphenyl (S)	%.						48600	46600	16-127			S4

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Soil Sampling
Pace Project No.: 2045170

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not DeX4 Environmentalted at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method deX4 Environmentaltion limit and below the adjusted reporting limit.MDL - Adjusted Method DeX4 Environmentaltion Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not deX4 Environmentalted.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M4	A matrix spike/matrix spike duplicate was not performed for this batch due to sample dilution.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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St. Rose, LA 70087
(504)469-0333

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2045170001	**OIL PRETREATMENT**	EPA 3546	66886	EPA 8015B Modified	66946
2045170002	**DIESEL-1 PRETREATMENT**	EPA 3546	66886	EPA 8015B Modified	66946
2045170003	**OIL 48-HOUR TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170004	**DIESEL-1 48-HOUR TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170005	**OIL 7-DAY TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170006	**DIESEL-1 7-DAY TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170001	**OIL PRETREATMENT**	EPA 5035A/5030B	66906	EPA 8015/8021	66914
2045170003	**OIL 48-HOUR TREATED**	EPA 5035A/5030B	66906	EPA 8015/8021	66914
2045170005	**OIL 7-DAY TREATED**	EPA 5035A/5030B	66906	EPA 8015/8021	66914

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www.,acela bs.com

CHAIN-OF-CUST.O
The Chain-of-Custody is a LEGAL

WO1:2045170

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2035524

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Add ze:,0 CiJ:>' A k	Copy To:	Company Name: REGULATORY AGEN.CY
Ar».,iz:r.(LE- S I ,,,,,.A.., "-::. Email To: =n:a-"1:, ...,· Lh. Q&;-r,,/"",: Order No.:		Address: Pace Quote Reference: (=6, Sc»J Cl--\..d,.J6-S.· i7, •.A.,.!.1 NPDES r UST GROUND WATER I RCRA DRINKING WATER OTHER T<€CAV
!' hone .s-q--.5 sta,1;:	Pr oject Name:	Pace Project Manager: M,G: -USA.' M. Site Location
Requested Du ic:,..)S	Pro Number.	Peoe Profile #: -,:1tb7;I 1,-\) · frAT : LA.

Section D Matrix Codes

Required Client Information M;'u812\ I CO !;

SAMPLE ID
(A-Z, 0-9 I,-)

Sample IDs MUST BE UNIQUE

Matrix	Code
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

COLLECTED — COMPOSITE START / COMPOSITE END/GRAB — DATE TIME DATE TIME

Preservatives

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.

#	Sample ID	Matrix		Collected	Preservatives	Pace Project No./ Lab I.D.
!!!	Olt... p < 4'(.N\ .-.JT	L	C.	-./ c	i	2 4, lJ.r.r.v" e''' h
-	O{e-=:>GL-.:I. P, 6-tkE-A'i''''' -(	"	'''	,ota:s ?		Z...., - \12....-12'''\ls. h
JI	n, , --Z PF!:.ef <.NC.E:N"f		e:.	acl.zs ;ea:,o		L½i-'- D
4						
-./	OLL l2. i:c::..1Pr-.i	15,L	C.	10/ .....L oe,:::o	.:1..	1 o.LJ>
	Dl&.S L-.i- 1 -J...\co 1 Q	"	<r	1o£el.. o.!IOo	''	',
.;J	o, sc;L..-,.Z.,,- , - t\.ooJZ/4		l.e.	...... I.Pi:... 0&D	j	c LI7
8						
1"1	DH- ,,e. - Noo - 1	LSl.	C.	to/,, ?n::in		L\r-..f b
1'''11	f")fG:,c:::.ci -.L .2"i- IZ:,_11 6P	''	''	l(jfL.L :z..a:o	•	••
	ntG:-.51Gl..:tL 2£J-iC(r-,, l5L.		C....	io.k£..	_j_	Ucl l:'''>
12	,,,,'--I---..					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
\..	-=-=---r. ,47/ /4	11/t)Q/c..	/ ¥..!	.A ---r /?14-u	11/crJttA	lf'{, '	L-1	L/1,. N	'l;
				I '--'''				I	f

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: /-' ,e.;-rMCX --,/?/,/

SIGNATURE of SAMPLER: - ..

DATE Signed (MM/DD/YY): I ,ft, (;, 'O

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-0 20rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: ,,c_ of 0

2035525

Section A
Required Client Information:

Company:
Address:
Email To:
Phone: Fax:
Riquested Due Date/TAT:

Section B
Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name:
Project Number:

Section C
Invoice Information:

Attention:
any N me:
Addre
= = =

REGIILATORY AGENCY

r NPDES r GROUND WATER r DRINKING WATER
r UST r RcRA oTHER R' Y

Si te L oca tion
STAT E::

Requested alysi$ filtered (Y/N)

s ction D
RequiredO ient InfOJma tion

SAMPLE ID
(A-Z, 0-9 I,-)
Sample IDs MUST BE UNIQUE

Matrix Codes

MATRO(/ CODE	
Drink\ng Water	DW
Water	WT
Waste Water	WW
Product	P
SoiVSolid	SL
Oil	OL
Wipe	WP
/>i,r	AR
nssue	TS
other	OT

COLLECTED
COMPOSITE START
POSrrE ENO/GRAB
DATE TIME DATE

Preservatives

Pace Project No./ Lab I.D.

ADDmONAL COMMENTS

DATE I TIME ACCEPTED BY / AFFILIATION DtTE I TIME SAMPLE CONilmDNS

SAMPLER NAM_E AND SIGN?11RE
PRINTNameof S PLER:
SIGNATUREafSAM
DATE Signed (MM/DDIYY): h b

O RIGINAL

'Important Note: By signing thiS form you are accepting Pace's NET 30 day payment terms and sgreeing to late charges of 1.5% per month for any invoices not paid within 30 dAys.

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Page: -3- of .3

2035526

Section A
Required Client Infonnation:

Company:
Address: "'-;cc f-- AC::lc ')(
Email To:
Phone: IFax:
Requested Due Date/TAT:

Section B
Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name:
Project Number.

Section C
Invoice Infotmation:

Attention:
Company Name:
Pace Oil\lf::,....---r Reference:
Pace..-.tiject **Manager:**
Pace Profie #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER R""Q".A

Site Location STATE: LA

Section D
Required Client Information

Matrix Codes	MATRIX I CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	p
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID
(A-Z, 0-9I,-)
Sample IDs MUST BE UNIQUE

COLLECTED: COMPOSITE START (DATE, TIME) — COMPOSITE eNO/GRAB (DATE, TIME)

PreseNatives

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.

ITEM #	SAMPLE ID		COLLECTED		Pace Project No./ Lab I.D.
1	OIL S- , 1 r-<'-P'	C.	10/-..m ;l'T'rl	...i..	'4oh...
2	,n -=' ---1 t..,,_nLf ,fp N(w	9... C.	, -:7r-rr".	1.	L o.Lb
3	OIL 6 fA , ,(UA{	C	aa/ar :?a:c,	i..	L\olb
4	j.& &J<i:... -<'17'		// ?	1.	1 1.J>
5	01-f.,..	C..	1d-:J1 .a'a:O	..1..	?c.J I\I"\L1s;! g'-&.h
6	n1G-c:.cc1-1.. -fJO.../ .,(e'E-		.: 1	,,1	'.2'--t-iJn..irc:... h
9					
10					
11					
12					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		h?d6	/ Y-5	V -Z-/J+-CP	i/n/,	f<f,(S"	h/

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

* Important Note: By signing this form you are accepting Pace's NET 30 *day* payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F- ALL-O-02Drev.07, 15-May-2007

WO#:2045170

;a.Analytical

1000 Riverbend, Blvd., Suite F
St. Rose, LA 70087

Sample Condition Upon Re **Pl'l: MMI** **Due Dale: 11/03/16**
CLIENT: 20-Gul(Earlh

Projc... ...1....---------- ....J

Courier: ☐ Pace Courier ☐ Hired Courier ☐ Fed X ☐ UPS ☐ OHL ☐ USPS \ Customer ☐ Other

Custody Seal on Cooler/Box Present: [see COC] **Custody Seals intact:** ☐Yes o

Therometer Used:	□ Therm Fisher IR 5 □ Therm Fisher IR 6 X'°herm Fisher IR 7

Type ol Icea GBloe **Nooe**

Samples on ice: [see COC]

Cooler Temperature: [see COC] Temp should be above freezing to 6°C

Date and Initials of person examining contents: 11-02-16 JM

Temp must be measured from Temperature blank when present

				Comments:
Temperature Blank Present"?	☐Yes	☐No	'tfSl_NIA	1
Chain of Custody Present:	ls:J.Yes	☐No	☐NIA	2
Chain of Custody Complete:	hi.Yes	☐No	☐NIA	3
Chain of Custody RelinQui shed:	es	☐No	☐NIA	4
Sampler Name & Signature on COC:	Yes	☐No	☐NIA	5
Samples Arrived within Hold Time:	es	☐No	☐NIA	6
Sufficient Volume:	es	☐No	☐NIA	7
Correct Containers Used:	'QYes	☐No	☐NIA	8 '-f 07..-
	☐			
Sample Labels match COC:	Yes	☐No	☐NIA	10
All containers received within manafacture's precautionary and/or expiration dates.	es	☐No	☐NIA	11
All containers needing chemical pr servation have been checked (except VOA, coliform, & O&G).	☐ Yes	☐No	A	12
All containerspreservation checked found to be in compliancewith EPA recommendation.	☐ Yes	☐No	NIA	13 If No, was preserative added? □Yes □No If added record lot no.: HN03___ H2S04
Headspace in VOA Vials (>Smm):	☐Yes	☐No	IA	14
Trip Blank Present:	☐Yes	o		15

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Pace Analytical Services, LLC
1000 Riverbend Blvd - Suite F
St. Rose, LA 70087
(504)469-0333

November 22, 2016

Peter Smith
Gulf Earth Partners
7200 Cypress Lakes Apt Blvd
Baton Rouge, LA 70809

RE: Project: Soil Sampling
Pace Project No.: 2045170

Dear Peter Smith:
Enclosed are the analytical results for sample(s) received by the laboratory on November 02, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report has been revised to analyze samples that were on hold per the client's reqeust.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melissa MacNaughton

Melissa MacNaughton
Melissa.MacNaughton@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: Soil Sampling
Pace Project No.: 2045170

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA
Florida Department of Health (NELAC): E87595
Illinois Environmental ProX4 Environmentaltion Agency: 0025721
Kansas Department of Health and Environment (NELAC): E-10266
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006
Pennsylvania Dept. of Env ProX4 Environmentaltion (NELAC): 68-04202Texas Commission on Env. Quality (NELAC): T104704405-09-TX
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119
Commonwealth of Virginia (TNI): 480246

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SAMPLE SUMMARY

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2045170001	**OIL PRETREATMENT**	Solid	10/25/16 20:00	11/02/16 14:45
2045170002	**DIESEL-1 PRETREATMENT**	Solid	10/25/16 20:00	11/02/16 14:45
2045170003	**OIL 48-HOUR TREATED**	Solid	10/27/16 20:00	11/02/16 14:45
2045170004	**DIESEL-1 48-HOUR TREATED**	Solid	10/27/16 20:00	11/02/16 14:45
2045170005	**OIL 7-DAY TREATED**	Solid	11/01/16 20:00	11/02/16 14:45
2045170006	**DIESEL-1 7-DAY TREATED**	Solid	11/01/16 20:00	11/02/16 14:45
2045170007	**Oil 24-Hour Treated**	Solid	10/26/16 20:00	11/02/16 14:45
2045170008	**Diesel-1 24-Hour Treated**	Solid	10/26/16 20:00	11/02/16 14:45
2045170009	**Oil 72-Hour Treated**	Solid	10/28/16 20:00	11/02/16 14:45
2045170010	**Diesel-1 72-Hour Treated**	Solid	10/28/16 20:00	11/02/16 14:45
2045170011	**Oil 5-Day Treated**	Solid	10/30/16 20:00	11/02/16 14:45
2045170012	**Diesel-1 5-Day Treated**	Solid	10/30/16 20:00	11/02/16 14:45

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SAMPLE ANALYTE COUNT

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2045170001	**OIL PRETREATMENT**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170002	**DIESEL-1 PRETREATMENT**	EPA 8015B Modified	ARW	3
2045170003	**OIL 48-HOUR TREATED**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170004	**DIESEL-1 48-HOUR TREATED**	EPA 8015B Modified	ARW	3
2045170005	**OIL 7-DAY TREATED**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170006	**DIESEL-1 7-DAY TREATED**	EPA 8015B Modified	ARW	3
2045170007	**Oil 24-Hour Treated**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170008	**Diesel-1 24-Hour Treated**	EPA 8015B Modified	ARW	3
2045170009	**Oil 72-Hour Treated**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170010	**Diesel-1 72-Hour Treated**	EPA 8015B Modified	ARW	3
2045170011	**Oil 5-Day Treated**	EPA 8015B Modified	ARW	4
		EPA 8015/8021	MHM	2
2045170012	**Diesel-1 5-Day Treated**	EPA 8015B Modified	ARW	3

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015B Modified**
Description: 8015M DRO/ORO Organics
Client: Gulf Earth Partners
Date: November 22, 2016

General Information:
12 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 66886

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- DIESEL-1 48-HOUR TREATED (Lab ID: 2045170004)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- DIESEL-1 7-DAY TREATED (Lab ID: 2045170006)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- DIESEL-1 PRETREATMENT (Lab ID: 2045170002)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MS (Lab ID: 278314)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MSD (Lab ID: 278315)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL 48-HOUR TREATED (Lab ID: 2045170003)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL 7-DAY TREATED (Lab ID: 2045170005)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- OIL PRETREATMENT (Lab ID: 2045170001)
  - n-Pentacosane (S)
  - o-Terphenyl (S)

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015B Modified**
Description: 8015M DRO/ORO Organics
Client: Gulf Earth Partners
Date: November 22, 2016

QC Batch: 67364

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- Diesel-1 24-Hour Treated (Lab ID: 2045170008)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- Diesel-1 5-Day Treated (Lab ID: 2045170012)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- Diesel-1 72-Hour Treated (Lab ID: 2045170010)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MS (Lab ID: 280137)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- MSD (Lab ID: 280138)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- Oil 24-Hour Treated (Lab ID: 2045170007)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- Oil 5-Day Treated (Lab ID: 2045170011)
  - n-Pentacosane (S)
  - o-Terphenyl (S)
- Oil 72-Hour Treated (Lab ID: 2045170009)
  - n-Pentacosane (S)
  - o-Terphenyl (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 66886

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- DIESEL-1 7-DAY TREATED (Lab ID: 2045170006)
  - Diesel Range Organic (C10-C28)

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015B Modified**
Description: 8015M DRO/ORO Organics
Client: Gulf Earth Partners
Date: November 22, 2016

Analyte Comments:

QC Batch: 67364

D4: Sample was diluted due to the presence of high levels of target analytes.

- Diesel-1 5-Day Treated (Lab ID: 2045170012)
  - Diesel Range Organic (C10-C28)
- Diesel-1 72-Hour Treated (Lab ID: 2045170010)
  - Diesel Range Organic (C10-C28)
- Oil 24-Hour Treated (Lab ID: 2045170007)
  - Diesel Range Organic (C10-C28)
- Oil 5-Day Treated (Lab ID: 2045170011)
  - Diesel Range Organic (C10-C28)
- Oil 72-Hour Treated (Lab ID: 2045170009)
  - Diesel Range Organic (C10-C28)

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PROJECT NARRATIVE

Project: Soil Sampling
Pace Project No.: 2045170

Method: **EPA 8015/8021**
Description: 8021 GCV BTEX, MTBE, GRO Med L
Client: Gulf Earth Partners
Date: November 22, 2016

General Information:
6 samples were analyzed for EPA 8015/8021. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the EPA method holding time.
- Oil 24-Hour Treated (Lab ID: 2045170007)

H2: Extraction or preparation conducted outside EPA method holding time.
- Oil 24-Hour Treated (Lab ID: 2045170007)

Sample Preparation:
The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: OIL PRETREATMENT **Lab ID: 2045170001** Collected: 10/25/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**84300**	mg/kg	996	20	11/02/16 16:13	11/03/16 11:03		M6
Oil Range Organics (>C28-C40)	**24000**	mg/kg	4980	20	11/02/16 16:13	11/03/16 11:03		
Surrogates								
o-Terphenyl (S)	27600	%.	16-127	20	11/02/16 16:13	11/03/16 11:03	84-15-1	S4
n-Pentacosane (S)	41200	%.	16-147	20	11/02/16 16:13	11/03/16 11:03	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**4710**	mg/kg	252	100	11/03/16 07:30	11/03/16 10:36		
Surrogates								
4-Bromofluorobenzene (S)	96	%.	44-148	100	11/03/16 07:30	11/03/16 10:36	460-00-4	

Sample: DIESEL-1 PRETREATMENT **Lab ID: 2045170002** Collected: 10/25/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**110000**	mg/kg	4900	100	11/02/16 16:13	11/03/16 16:07		
Surrogates								
o-Terphenyl (S)	70500	%.	16-127	100	11/02/16 16:13	11/03/16 16:07	84-15-1	S4
n-Pentacosane (S)	3210	%.	16-147	100	11/02/16 16:13	11/03/16 16:07	629-99-2	S4

Sample: OIL 48-HOUR TREATED **Lab ID: 2045170003** Collected: 10/27/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**31800**	mg/kg	978	100	11/02/16 16:13	11/03/16 16:35		
Oil Range Organics (>C28-C40)	**8530**	mg/kg	4890	100	11/02/16 16:13	11/03/16 16:35		
Surrogates								
o-Terphenyl (S)	11900	%.	16-127	100	11/02/16 16:13	11/03/16 16:35	84-15-1	S4
n-Pentacosane (S)	16300	%.	16-147	100	11/02/16 16:13	11/03/16 16:35	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**2600**	mg/kg	252	100	11/03/16 07:30	11/03/16 11:02		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	44-148	100	11/03/16 07:30	11/03/16 11:02	460-00-4	

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: DIESEL-1 48-HOUR TREATED **Lab ID: 2045170004** Collected: 10/27/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**38000**	mg/kg	980	100	11/02/16 16:13	11/03/16 13:36		
Surrogates								
o-Terphenyl (S)	25900	%.	16-127	100	11/02/16 16:13	11/03/16 13:36	84-15-1	S4
n-Pentacosane (S)	1340	%.	16-147	100	11/02/16 16:13	11/03/16 13:36	629-99-2	S4

Sample: OIL 7-DAY TREATED **Lab ID: 2045170005** Collected: 11/01/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**14000**	mg/kg	4920	100	11/02/16 16:13	11/03/16 14:04		
Oil Range Organics (>C28-C40)	ND	mg/kg	24600	100	11/02/16 16:13	11/03/16 14:04		
Surrogates								
o-Terphenyl (S)	7130	%.	16-127	100	11/02/16 16:13	11/03/16 14:04	84-15-1	S4
n-Pentacosane (S)	7840	%.	16-147	100	11/02/16 16:13	11/03/16 14:04	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**883**	mg/kg	46.8	20	11/03/16 07:30	11/03/16 12:09		
Surrogates								
4-Bromofluorobenzene (S)	104	%.	44-148	20	11/03/16 07:30	11/03/16 12:09	460-00-4	

Sample: DIESEL-1 7-DAY TREATED **Lab ID: 2045170006** Collected: 11/01/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**12000**	mg/kg	97.8	10	11/02/16 16:13	11/03/16 14:32		E
Surrogates								
o-Terphenyl (S)	6280	%.	16-127	10	11/02/16 16:13	11/03/16 14:32	84-15-1	S4
n-Pentacosane (S)	953	%.	16-147	10	11/02/16 16:13	11/03/16 14:32	629-99-2	S4

Sample: Oil 24-Hour Treated **Lab ID: 2045170007** Collected: 10/26/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**36800**	mg/kg	492	50	11/09/16 17:04	11/16/16 20:00		D4,M6
Oil Range Organics (>C28-C40)	**13500**	mg/kg	2460	50	11/09/16 17:04	11/16/16 20:00		
Surrogates								
o-Terphenyl (S)	6030	%.	16-127	50	11/09/16 17:04	11/16/16 20:00	84-15-1	S4

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: Oil 24-Hour Treated **Lab ID: 2045170007** Collected: 10/26/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Surrogates								
n-Pentacosane (S)	5970	%.	16-147	50	11/09/16 17:04	11/16/16 20:00	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021		Preparation Method: EPA 5035A/5030B					
Gasoline Range Organics	**11400**	mg/kg	1200	100	11/10/16 16:35	11/11/16 01:08		H1,H2
Surrogates								
4-Bromofluorobenzene (S)	95	%.	44-148	100	11/10/16 16:35	11/11/16 01:08	460-00-4	

Sample: Diesel-1 24-Hour Treated **Lab ID: 2045170008** Collected: 10/26/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**51300**	mg/kg	2290	250	11/09/16 17:04	11/17/16 15:53		
Surrogates								
o-Terphenyl (S)	8850	%.	16-127	250	11/09/16 17:04	11/17/16 15:53	84-15-1	S4
n-Pentacosane (S)	7340	%.	16-147	250	11/09/16 17:04	11/17/16 15:53	629-99-2	S4

Sample: Oil 72-Hour Treated **Lab ID: 2045170009** Collected: 10/28/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**22300**	mg/kg	493	50	11/09/16 17:04	11/16/16 21:51		D4
Oil Range Organics (>C28-C40)	**11400**	mg/kg	2460	50	11/09/16 17:04	11/16/16 21:51		
Surrogates								
o-Terphenyl (S)	2510	%.	16-127	50	11/09/16 17:04	11/16/16 21:51	84-15-1	S4
n-Pentacosane (S)	4930	%.	16-147	50	11/09/16 17:04	11/16/16 21:51	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021		Preparation Method: EPA 5035A/5030B					
Gasoline Range Organics	**6230**	mg/kg	124	10	11/10/16 16:35	11/11/16 09:46		
Surrogates								
4-Bromofluorobenzene (S)	130	%.	44-148	10	11/10/16 16:35	11/11/16 09:46	460-00-4	

Sample: Diesel-1 72-Hour Treated **Lab ID: 2045170010** Collected: 10/28/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified		Preparation Method: EPA 3546					
Diesel Range Organic (C10-C28)	**43500**	mg/kg	495	50	11/09/16 17:04	11/16/16 23:15		D4

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ANALYTICAL RESULTS

Project: Soil Sampling
Pace Project No.: 2045170

Sample: Diesel-1 72-Hour Treated **Lab ID: 2045170010** Collected: 10/28/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Surrogates								
o-Terphenyl (S)	24900	%.	16-127	50	11/09/16 17:04	11/16/16 23:15	84-15-1	S4
n-Pentacosane (S)	866	%.	16-147	50	11/09/16 17:04	11/16/16 23:15	629-99-2	S4

Sample: Oil 5-Day Treated **Lab ID: 2045170011** Collected: 10/30/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**20600**	mg/kg	487	50	11/09/16 17:04	11/16/16 23:43		D4
Oil Range Organics (>C28-C40)	**9190**	mg/kg	2440	50	11/09/16 17:04	11/16/16 23:43		
Surrogates								
o-Terphenyl (S)	8290	%.	16-127	50	11/09/16 17:04	11/16/16 23:43	84-15-1	S4
n-Pentacosane (S)	11800	%.	16-147	50	11/09/16 17:04	11/16/16 23:43	629-99-2	S4
8021 GCV BTEX, MTBE, GRO Med L	Analytical Method: EPA 8015/8021 Preparation Method: EPA 5035A/5030B							
Gasoline Range Organics	**4060**	mg/kg	112	10	11/10/16 16:35	11/11/16 10:12		
Surrogates								
4-Bromofluorobenzene (S)	118	%.	44-148	10	11/10/16 16:35	11/11/16 10:12	460-00-4	

Sample: Diesel-1 5-Day Treated **Lab ID: 2045170012** Collected: 10/30/16 20:00 Received: 11/02/16 14:45 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M DRO/ORO Organics	Analytical Method: EPA 8015B Modified Preparation Method: EPA 3546							
Diesel Range Organic (C10-C28)	**35100**	mg/kg	490	50	11/09/16 17:04	11/17/16 00:10		D4
Surrogates								
o-Terphenyl (S)	24500	%.	16-127	50	11/09/16 17:04	11/17/16 00:10	84-15-1	S4
n-Pentacosane (S)	898	%.	16-147	50	11/09/16 17:04	11/17/16 00:10	629-99-2	S4

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QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 66906 Analysis Method: EPA 8015/8021
QC Batch Method: EPA 5035A/5030B Analysis Description: 8021 BTEX, MTBE, GRO Medium Level Soil
Associated Lab Samples: 2045170001, 2045170003, 2045170005

METHOD BLANK: 278362 Matrix: Solid
Associated Lab Samples: 2045170001, 2045170003, 2045170005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.5	11/03/16 09:44	
4-Bromofluorobenzene (S)	%.	94	44-148	11/03/16 09:44	

LABORATORY CONTROL SAMPLE: 278363

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	25	25.8	103	61-136	M4
4-Bromofluorobenzene (S)	%.			94	44-148	

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QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 67429 Analysis Method: EPA 8015/8021
QC Batch Method: EPA 5035A/5030B Analysis Description: 8021 BTEX, MTBE, GRO Medium Level Soil
Associated Lab Samples: 2045170007, 2045170009, 2045170011

METHOD BLANK: 280404 Matrix: Solid
Associated Lab Samples: 2045170007, 2045170009, 2045170011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.5	11/10/16 21:12	
4-Bromofluorobenzene (S)	%.	94	44-148	11/10/16 21:12	

LABORATORY CONTROL SAMPLE: 280405

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	25	28.5	114	61-136	M4
4-Bromofluorobenzene (S)	%.			95	44-148	
4-Bromofluorobenzene (S)	%.			95	44-148	

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QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 66886 Analysis Method: EPA 8015B Modified
QC Batch Method: EPA 3546 Analysis Description: EPA 8015 ORO
Associated Lab Samples: 2045170001, 2045170002, 2045170003, 2045170004, 2045170005, 2045170006

METHOD BLANK: 278312 Matrix: Solid
Associated Lab Samples: 2045170001, 2045170002, 2045170003, 2045170004, 2045170005, 2045170006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	ND	10.0	11/03/16 10:03	
Oil Range Organics (>C28-C40)	mg/kg	ND	50.0	11/03/16 10:03	
n-Pentacosane (S)	%.	88	16-147	11/03/16 10:03	
o-Terphenyl (S)	%.	78	16-127	11/03/16 10:03	

LABORATORY CONTROL SAMPLE: 278313

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	40	35.8	90	34-125	
n-Pentacosane (S)	%.			88	16-147	
o-Terphenyl (S)	%.			94	16-127	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 278314 278315

Parameter	Units	2045170001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Range Organic (C10-C28)	mg/kg	84300	37.3	38.9	127000	124000	115000	102000	10-163	3	20	M6
n-Pentacosane (S)	%.						90400	63700	16-147			S4
o-Terphenyl (S)	%.						48600	46600	16-127			S4

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QUALITY CONTROL DATA

Project: Soil Sampling
Pace Project No.: 2045170

QC Batch: 67364 Analysis Method: EPA 8015B Modified
QC Batch Method: EPA 3546 Analysis Description: EPA 8015 ORO
Associated Lab Samples: 2045170007, 2045170008, 2045170009, 2045170010, 2045170011, 2045170012

METHOD BLANK: 280135 Matrix: Solid
Associated Lab Samples: 2045170007, 2045170008, 2045170009, 2045170010, 2045170011, 2045170012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	ND	10.0	11/16/16 16:09	
Oil Range Organics (>C28-C40)	mg/kg	ND	50.0	11/16/16 16:09	
n-Pentacosane (S)	%.	83	16-147	11/16/16 16:09	
o-Terphenyl (S)	%.	68	16-127	11/16/16 16:09	

LABORATORY CONTROL SAMPLE: 280136

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range Organic (C10-C28)	mg/kg	40	40.3	101	34-125	
n-Pentacosane (S)	%.			82	16-147	
o-Terphenyl (S)	%.			83	16-127	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 280137 280138

Parameter	Units	2045170007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Range Organic (C10-C28)	mg/kg	36800	38.3	39.3	83500	75800	122000	99300	10-163	10	20	M6
n-Pentacosane (S)	%.						12800	11500	16-147			S4
o-Terphenyl (S)	%.						5950	5490	16-127			S4

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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St. Rose, LA 70087
(504)469-0333

QUALIFIERS

Project: Soil Sampling
Pace Project No.: 2045170

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not DeX4 Environmentalted at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method deX4 Environmentaltion limit and below the adjusted

reporting limit.MDL - Adjusted Method DeX4 Environmentaltion Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not deX4 Environmentalted.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

ANALYTE QUALIFIERS

D4	Sample was diluted due to the presence of high levels of target analytes.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H1	Analysis conducted outside the EPA method holding time.
H2	Extraction or preparation conducted outside EPA method holding time.
M4	A matrix spike/matrix spike duplicate was not performed for this batch due to sample dilution.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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St. Rose, LA 70087
(504)469-0333

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Soil Sampling
Pace Project No.: 2045170

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2045170001	**OIL PRETREATMENT**	EPA 3546	66886	EPA 8015B Modified	66946
2045170002	**DIESEL-1 PRETREATMENT**	EPA 3546	66886	EPA 8015B Modified	66946
2045170003	**OIL 48-HOUR TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170004	**DIESEL-1 48-HOUR TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170005	**OIL 7-DAY TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170006	**DIESEL-1 7-DAY TREATED**	EPA 3546	66886	EPA 8015B Modified	66946
2045170007	**Oil 24-Hour Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170008	**Diesel-1 24-Hour Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170009	**Oil 72-Hour Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170010	**Diesel-1 72-Hour Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170011	**Oil 5-Day Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170012	**Diesel-1 5-Day Treated**	EPA 3546	67364	EPA 8015B Modified	67933
2045170001	**OIL PRETREATMENT**	EPA 5035A/5030B	66906	EPA 8015/8021	66914
2045170003	**OIL 48-HOUR TREATED**	EPA 5035A/5030B	66906	EPA 8015/8021	66914
2045170005	**OIL 7-DAY TREATED**	EPA 5035A/5030B	66906	EPA 8015/8021	66914
2045170007	**Oil 24-Hour Treated**	EPA 5035A/5030B	67429	EPA 8015/8021	67476
2045170009	**Oil 72-Hour Treated**	EPA 5035A/5030B	67429	EPA 8015/8021	67476
2045170011	**Oil 5-Day Treated**	EPA 5035A/5030B	67429	EPA 8015/8021	67476

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CHAIN-OF-CUST.O
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WO1:2045170

Page: -1 of -.:3

2035524

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Add ze:,0 CiJ:> k	Copy To:	Company Name: REGULATORY AGEN.CY
Email To: =n:a-"1:, Lh. Q&;-r,,/"",:	Purchase Order No.:	Address: Pace Quote Reference: (=6, \ Sc»J Cl--\..d,.J6-S. i7, NPDES UST GROUND WATER RCRA DRINKING WATER OTHER T<CCAV
Phone .s-q--.3 sta,1;;	Project Name:	Pace Project Manager: M,G: -USA.' M. Site Location
Requested Du ic:,..)S	Project Number.	Pace Profile #: -,:1tb7,J 1,-\ ) frAT : LA.

Section D Required Client Information

Matrix Codes: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 I,-)
Sample IDs MUST BE UNIQUE

COLLECTED: COMPOSITE START / COMPOSITE END/GRAB — DATE TIME DATE TIME

Preservatives

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.

#	SAMPLE ID	Matrix	Type	Date / Time	Pace Project No./ Lab I.D.
1	Olt... p < 4'(.N\ .-.JT	L	C.	-./ c	2 4, lJ.r.r.v" e"' h \12....-12"'\ls. h
2	O{e-=:>GL-.:l. P, 6-tkE-A'i""' -(	//	...	,ota:s ?	
3	n, , --Z PF!:.ef <.NC.E:N"f		e:.	acl.zs ;ea:,o	L½i-'- D
4	-./ OLL l2. i:c::..1Pr-.i	15,L	C.	10/ ....L oe,:::o	1 o.LJ>
5	Dl&.S L-.i- 1 -J...\co 1 Q	"		1o£el.. o.!IOo	',
6	o, sc;L..-,.Z.,,- , - t\.ooJZ/4		l.e.	...... l.Pi:... 0&D	c LI7
7					
8	1"1 DH- ,,e. - Noo - 1	LSI.	C.	to/,, ?n::in	L\r-..f b
9	1"'11 f")fG:,c:::.ci -.L .2"i- IZ:,_11 6P	..	..	l(jfL.L z..a:o	••
10	ntG:-.51Gl..:tL 2£J-iC r-,, l5L.	C....		io.k£..	Ucl l:">
11					
12					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
\..	-=--r. ,47/ /4	11/t)Q/c..	/ ¥..!	A ---r /?14-u	11/crJttA	lf'{, '	L-1 L/1,. N 'l;
							I f

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: MCX
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): ,ft, (;,

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-0 20rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: ,,c_ of 0

2035525

Section A
Required Client Information:

Company:
Address:
Email To:
Phone: Fax:
Riquested Due Date/TAT:

Section B
Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name:
Project Number:

Section C
Invoice Information:

Attention:
any N me:
Addre
= = =

REGIILATORY AGENCY

r NPDES r GROUND WATER r DRINKING WATER
r UST r RcRA oTHER R' Y

Si te L oca tion
STAT E::

Reqested alysi$ filtered (Y/N)

s ction D
RequiredO ient InfOJma tion

SAMPLE ID
(A-Z, 0-9 I,-)
Sample IDs MUST BE UNIQUE

Matrix Codes

MATRO(/ CODE	
Drink\ng Water	DW
Water	WT
Waste Water	WW
Product	P
SoiVSolid	SL
Oil	OL
Wipe	WP
/>i,r	AR
nssue	TS
other	OT

COLLECTED
COMPOSITE START
POSrrE ENO/GRAB
DATE TIME DATE

Preservatives

Pace Project No./ Lab I.D.

Not-D

ADDmONAL COMMENTS

DATE I TIME ACCEPTED BY / AFFILIATION DtTE I TIME SAMPLE CONilmDNS

O RIGINAL

SAMPLER NAM_E AND SIGN?11RE
PRINTNameof S PLER:
SIGNATUREafSAM
DATE Signed (MM/DDIYY): h b

'Important Note: By signing thiS form you are accepting Pace's NET 30 day payment terms and sgreeing to late charges of 1.5% per month for any invoices not paid within 30 dAys.

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2035526

Section A
Required Client Infonnation:

Company:
Address: "'-;cc f-AC::lc ')(
Email To:
Phone: IFax:
Requested Due Date/TAT:

Section B
Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name:
Project Number.

Section C
Invoice Infotmation:

Attention:
Company Name:
Pace Oil\f::,....---r Reference:
Pace..-.tiject Manager:
Pace Profie #:

REGULATORY AGENCY

NPDES — GROUND WATER — DRINKING WATER — UST — RCRA — OTHER R""Q".A

Site Location S_TATE: LA

Requested Analysis Flitered (YIN)

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9I,-)
Sample IDs MUST BE UNIQUE

Matrix Codes	MATRIX I CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	p
Soil/Solid	SL
011	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

COLLECTED: COMPOSITE START (DATE, TIME) — COMPOSITE eNO/GRAB (DATE, TIME)

PreseNatives

Pace Project No./ Lab I.D.

ITEM #	SAMPLE ID		DATE / TIME		Pace Project No./ Lab I.D.
1	.J OIL S-, 1 r-<'-P'	C.	10/-..m ;I'T'I	...i..	'4oh...
2	J ,n -=' t..,,_nLf ,fp N(w	9... C.	-:7r-rt".	1.	L o.Lb
3	..J OIL 6 fA ,(UA{	C	aa/ar :?a:c,	.i..	L\olb
4	../ c ' j.& &J<i:... -<'l7'			1.	1 1.J>
5	./ 01-f.,..	C..	1d-:J1 .a'a:O	..1..	?c.J I\I"\L1s;! g'-&.h
6	n1G-c:.cc1-1.. -fJO.../ .,(e'E-		.: 1	,,1	'.2'--t-iJn..irc:... h
9					
10					
11					
12					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		h?d6	Y-5	Z-/J+-CP	i/n/,	f<f,(S"	h/

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Important Note: By signing this form you are accepting Pace's NET 30 *day* payment terms and agreeing to late charges of 1.5% per month for all invoices not

F- ALL-O-02Drev.07, 15-Mav-2007

WO#:2045170

;a.Analytical

1000 Riverbend, Blvd., Suite F
Sl. Rose, LA 70087

Sample Condition Upon Re **Pl'l: MMI** **Due Dale: 11/03/16**
CLIENT: 20-Gul(Earlh

Projc... ...1....---------- ....J

Courier: ☐ Pace Courier ☐ Hired Courier ☐ Fed X ☐ UPS ☐ OHL ☐ USPS \ Customer ☐ Other

Custody Seal on Cooler/Box Present: [see COC] **Custody Seals intact:** ☐Yes o

Therometer Used:	□ Therm Fisher IR 5 □ Therm Fisher IR 6 X'°herm Fisher IR 7

Type ol Icea GBloe **Nooe**

Samples on ice: [see COC]

Cooler Temperature: [see COC] Temp should be above freezing to 6°C

Date and Initials of person examining contents: 11-02-16 JM

Temp must be measured from Temperature blank when present

				Comments:
Temperature Blank Present"?	☐Yes	☐No	'tfSl_NIA	1
Chain of Custody Present:	ls:J.Yes	☐No	☐NIA	2
Chain of Custody Complete:	hi.Yes	☐No	☐NIA	3
Chain of Custody RelinQui shed:	es	☐No	☐NIA	4
Sampler Name & Signature on COC:	Yes	☐No	☐NIA	5
Samples Arrived within Hold Time:	es	☐No	☐NIA	6
Sufficient Volume:	es	☐No	☐NIA	7
Correct Containers Used:	'QYes	☐No	☐NIA	8 '-f 07..-
	☐			
Sample Labels match COC:	Yes	☐No	☐NIA	10
All containers received within manafacture's precautionary and/or expiration dates.	es	☐No	☐NIA	11
All containers needing chemical pr servation have been checked (except VOA, coliform, & O&G).	☐ Yes	☐No	A	12
All containerspreservation checked found to be in compliancewith EPA recommendation.	☐ Yes	☐No	NIA	13 If No, was preserative added? □Yes □No If added record lot no.: HN03___ H2S04
Headspace in VOA Vials (>Smm):	☐Yes	☐No	IA	14
Trip Blank Present:	☐Yes	o		15

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____