From: Yu, Olivia, EMNRD
To: "Foord, William (Scott)"
Cc: "Groves, Amber"; Oberding, Tomas, EMNRD
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports
Date: Monday, April 17, 2017 10:24:00 AM

Good morning Scott:

NMOCD and NMSLO agree that no further delineation is required for 1RP-3942 Abo Reef Gathering System.

Thanks,
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Wednesday, April 12, 2017 11:52 AM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Subject: Re: 074638 Abo Reef Gathering System Analytical Reports

Thank you Olivia, please keep me updated.

Scott

Sent from my iPhone

On Apr 12, 2017, at 12:48 PM, Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us> wrote:

> Scott:
>
> Pardon for not responding. I was in the field yesterday and this morning, so did not have much time to write emails. I spoke with Tomáš and we decided that the additional delineation would not be needed for this site. At the time I spoke with Amber, she has not reviewed the material yet. I'll try again sometime today.
>
> Olivia
>
> ---
>
> **From:** Foord, William (Scott) [mailto:William.Foord@ghd.com]
> **Sent:** Wednesday, April 12, 2017 10:49 AM
> **To:** Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
> **Subject:** Re: 074638 Abo Reef Gathering System Analytical Reports
>
> Olivia,
>
> Any word back?
>
> Thanks,

Scott

Sent from my iPhone

On Apr 11, 2017, at 9:13 AM, Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us> wrote:

> Good morning Scott:
>
> Thank you for the update. Pardon the delay. I will converse with Tomáš and Amber today about additional horizontal delineation and let you know ASAP.
>
> Olivia
>
> ---
>
> **From:** Foord, William (Scott) [mailto:William.Foord@ghd.com]
> **Sent:** Tuesday, April 11, 2017 7:37 AM
> **To:** Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
> **Subject:** RE: 074638 Abo Reef Gathering System Analytical Reports
>
> Olivia,
>
> Have you received any responses from Amber or Tomas on the question of the RRALs based on gw depth of <100 ft at Abo Reef? The water well located within a couple of hundred feet from the site was confirmed dry at 104 ft and the 4 ft historic excavation has been lined and backfilled following work plan approval from NMOCD (confusion of the depth earlier was my bad memory, we had to build a ramp down into the excavation previously to get the drill rig in). Additionally, GHD currently monitors several sites within a mile radius of the site with confirmed gw elevations greater than 120 ft bgs. We are trying to finalize budgeting for this site and if additional assessment activities are requested, significantly greater funding will have to be requested. Please let me know if you need any additional information from me or if you would like to schedule a call to discuss.
>
> Take care,
> Scott
>
> ---
>
> **From:** Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
> **Sent:** Friday, March 24, 2017 5:21 PM
> **To:** Foord, William (Scott)
> **Cc:** Groves, Amber; Oberding, Tomas, EMNRD; Jason Michelson (JMichelson@chevron.com)
> **Subject:** RE: 074638 Abo Reef Gathering System Analytical Reports
>
> Scott:

NMOCD decided that given the amount of work already completed for 1RP-3942, the incident can move towards closure if the below information is provided:

1. Confirmation of the depth of excavation. The first page of the Abo Reef Gathering System soil assessment and delineation report (February 2, 2017) stated that the entire site was excavated to 4 ft. and a liner set at 4 ft. bgs, even though the text of the report and the response below indicate otherwise. If confirmation is provided of the depth of excavation and liner, then NMOCD considers the delineation and remediation of the release area complete.
2. However, as SW3 and SW4 are above permissible TPH and chloride levels (based on average depth to groundwater of <100 ft.) at 2.5 ft. bgs and bottom confirmation samples at 4 ft. were not taken (presumably, please provide otherwise), NMOCD requests that two soil bores directly opposite SW3 & SW4, on the western side of the underground pipeline, be established. These borehole locations would be considered sufficient to complete horizontal and vertical delineation of TPH and chlorides for this site.

Please let me know if you have questions, want clarification, and whether you agree to these conditions or not.

Thanks,
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Friday, March 24, 2017 1:18 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Groves, Amber <agroves@slo.state.nm.us>; Oberding, Tomas, EMNRD <Tomas.Oberding@state.nm.us>; Jason Michelson (JMichelson@chevron.com) <JMichelson@chevron.com>
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Olivia,

Understood. Please note the age of installation and logs for many of the historic wells in the NMOSE database and that groundwater levels have fallen dramatically in the area in the last few decades. I'll do some research in our database and see if we have any other sites with wells nearby with recent gauging data, will forward if I find anything.

Have a great weekend and please let me know if you need any additional information from me.

Scott

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Friday, March 24, 2017 1:46 PM
To: Foord, William (Scott)
Cc: Groves, Amber; Oberding, Tomas, EMNRD
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Scott:

Thank you for the update about the upcoming visit to the site. Please keep us informed.

FYI. Regardless of whether the L05411 well is active or not, NMOCD evaluates permissible levels for releases based on the presumed depth to groundwater in a 2000 m radius (equivalent to the length of a section) from the average of all OSE wells, whether active and not. Additionally, the Chevron Water Trend map is consulted, which also indicates water table at <100 ft. bgs. I can provide the map for Lea County to you if you don't already have a copy.

Thanks,
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Friday, March 24, 2017 11:07 AM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Groves, Amber <agroves@slo.state.nm.us>; Oberding, Tomas, EMNRD <Tomas.Oberding@state.nm.us>
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Olivia,

Here's where the well (L05411) plots from the coordinates from the NMOSE database. Says it was installed in 1964, pretty sure it's not there now, we used that area as a staging area when we backfilled the historic excavation last year and I don't remember seeing anything. I have a tech in the area tomorrow; he will drive by and take a look to verify. I'll send pics when I get them and let you know if he finds anything.

Scott

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Friday, March 24, 2017 10:42 AM
To: Foord, William (Scott)
Cc: Groves, Amber; Oberding, Tomas, EMNRD

Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Scott:

Happy Friday to you, too! Thank you for your prompt response and documents. I do have the previous reports, which I retrieved from NMOCD's online database, and am reviewing them now. The reason why I am asking is that there might be a change in assessment, based on information about depth to groundwater and nearest waterbody. I checked the NM Office of State Engineer's database and it showed a well <1000 ft. away and at 60 ft. bgs (L05411), which changes the RRALs, and thus, the corrective actions. The well search is attached for your information.

Still, the remediation work might be adequate depending on the depth that the liner was set. I will get back to you by the end of today after conversing with my supervisors in Santa Fe.

Thanks,
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Friday, March 24, 2017 8:58 AM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Happy Friday Olivia!

The work was conducted following work plan approval by NMOCD on January 25, 2016. I've attached the approved work plan for your reference. NMOCD requested vertical delineation of one former soil sample (SS-2), which was completed last year and details are in the report you are currently reviewing.

The depth of the excavation varied from around a foot to approximately 4 feet. A previous report was submitted in 2015 with the data you are inquiring about. The report is big (10 MB) so I'll have to piece mail it to you if you don't have it. It should be in your data base already though. I've attached the soil sample concentration tables and a figure with the majority of the info from that report. Let me know if you need the rest of the report and I'll break it down and send.

Scott

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Friday, March 24, 2017 9:42 AM
To: Foord, William (Scott)
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Good morning Scott:

I am reviewing the delineation report for 1RP-3942 now. Unless I am mistaken, the report did not specify the actual depth of the excavation and at what depth the liner was set. Were bottom confirmation samples taken for BTEX, TPH, chlorides? Please provide this information or point to which page(s) I should be reading more closely.

Thanks!
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Tuesday, March 14, 2017 3:23 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Good deal. Please let me know if you have any questions or concerns.

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Tuesday, March 14, 2017 4:22 PM
To: Foord, William (Scott)
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Thanks much! Received both analyticals and delineation workplan. I will review as soon as possible.

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Tuesday, March 14, 2017 3:11 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Here's the analytical.

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Tuesday, March 14, 2017 4:04 PM
To: Foord, William (Scott)
Subject: RE: 074638 Abo Reef Gathering System Analytical Reports

Hi Scott:

Really sorry. I didn't know that the system does not like zip files. Neither attachments escaped the scrubber. I think 2 separate pdfs of 5 mbs

should get through. I've received your previous emails with pdfs of this size without any issues.

Thanks for your patience,
Olivia

From: Foord, William (Scott) [mailto:William.Foord@ghd.com]
Sent: Tuesday, March 14, 2017 1:57 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Subject: 074638 Abo Reef Gathering System Analytical Reports

Olivia,

Here are the lab reports (5MB still….), let me know if it works.

Scott

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Untitled Map
Write a description for your map.
Legend
Feature 1
Feature 2
Abo Reef
L 05411
238
Google earth
© 2016 Google
N
600 ft

Robert Speer
Portfolio Manager,
Upstream Business Unit
Remediation Team

Chevron Environmental Management Company
1400 Smith St. 07049
Houston, TX 77002
Tel (731) 372-6117
Cell (713) 301-7274
rspeer@chevron.com

February 2, 2017

INFORMATION ONLY

Olivia Yu
Environmental Specialist, District 1
New Mexico Oil Conservation Division
1625 N. French Dr.
Hobbs, NM 88240

Re: Abo Reef Gathering System Soil Assessment and Delineation Report

Dear Ms. Yu:

Please find enclosed for your files copies of the following report for the Abo Reef Gathering System (AB TN-9) Trunkline release project site.

- *Abo Reef Gathering System – 2016 Soil Assessment and Delineation Report, Unit J - Section 6 – Township 18 South – Range 35 East, Lea County, NM*

This report was prepared by Conestoga-Rovers & Associates (CRA) on behalf of Chevron Environmental Management Company (CEMC) to document assessment activities for a release of between 1.565 bbls of oil due to damage to an out of service gathering line from a well field wild fire as documented in the initial C-141 report of January 2011. Soil sampling in the release area indicate that vertical and horizontal delineation of Chlorides and hydrocarbon components has been achieved at the site. Following delineation, the site was excavated to a depth of 4 feet, lined, and backfilled. The attached report details the delineation and remediation activities for the site.

Should you have any questions regarding the content of this report, please do not hesitate to contact me. I look forward to working with you in the future.

Sincerely,

Rob Speer
Environmental Project Manager

Soil Assessment and Delineation Activities Report

Abo Reef Gathering System (AB TN-9) Trunkline Release
Unit J, Section 6, Township 18 South, Range 35 East
Lovington, New Mexico

Chevron Environmental Management Company

GHD | 6320 Rothway Street Suite 100 Houston Texas 77040
074638 | Report No 4 | November 2016

Soil Assessment and Delineation Activities Report

Abo Reef Gathering System (AB TN-9) Trunkline Release
Unit J, Section 6, Township 18 South, Range 35 East
Lovington, New Mexico

Chevron Environmental Management Company

Scott Foord, P.G., Project Manager

Raaj Patel, P.G., Senior Project Manager

6320 Rothway, Suite 100, Houston, Texas USA

074638 | Report No 4 | November 2016

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Appendices

1. Introduction

GHD Services, Inc. (GHD) is pleased to present this *Soil Assessment and Delineation Activities Report* to Chevron Environmental Management Company (Chevron) for the Abo Reef Gathering System (AB TN-9) trunkline release location (hereafter referred to as the "Site").

2. Project Information and Background

The Site is located in Unit J, Section 6, Township 18 South, Range 35 East, approximately 2.91 miles southeast of Buckeye, New Mexico, in eastern Lea County (Figure 1 and Figure 2).

Chevron submitted an initial C-141 form (Appendix A) to the New Mexico Oil Conservation Division (NMOCD) dated January 7, 2011, describing a release of 1.565 barrels (bbls) of oil and 34.696 bbls of water with zero (0) volume being recovered. The source of the release was recorded to have been a gas gathering trunkline and the release was described as follows:

"The source of the leak is a gas gathering line that was supposed to be out of service. It was damaged during the grass fire last year. It appears . . . the check valve on gathering system leaked allowing gas to vent out of the pipe where it had been burned. . . . I suspect the oil came from a leaking wellhead check valve at the well."

Crain Environmental (Crain) conducted the initial field assessment activities at the Site in January 2011. Crain's assessment included a site visit, soil sample collection, analytical laboratory analyses and preliminary determinations of impacts to environmental media. GHD met with Ms. Crain on April 21, 2011 to review and transfer the file material for the Site as well as to discuss the history of delineation efforts to date for the Site.

The Site contains an excavation that is configured in a generally rectangular fashion and dimensioned approximately 50 feet by 100 feet. The long axis of the excavation is oriented approximately north-south, with an underground pipeline in proximity to its western border. This excavation is apparently associated with remediation efforts for a prior release at the Site that occurred at an unknown time. Information regarding the nature and extent of that potential prior release are also unknown. Based on the dimensions of the excavation, approximately 1,000 cubic yards of soil were removed from the excavation. The actual volume and final disposition of the excavated soils are unknown to GHD.

In 2014, Chevron contracted GHD to perform a comprehensive soil assessment at the Site by implementing a soil boring program. On March 14, 2014, GHD mobilized to the Site to mark proposed boring locations and one-call parameters. On March 17, 2014, GHD advanced four soil borings to approximately 50 feet below ground surface (bgs). In addition, GHD collected a number of soil samples from the surface and sidewalls of the existing excavation. Results of the 2014 soil boring and sampling program indicated the presence of total petroleum hydrocarbons (TPH) and chlorides in the shallow subsurface.

In May 2014, GHD prepared and submitted a soil assessment and delineation activities report to Chevron detailing recommendations to further investigate and determine the vertical extent of TPH and chloride impacts at the Site. Chevron concurred with the recommendations outlined in GHD's 2014 report, thus GHD returned to the Site in 2015 to execute the planned field activities. Results

of the 2014 and 2015 activities were submitted to NMOCD in a soil assessment and delineation activities report dated September 25, 2015. The conclusions indicated that vertical and horizontal delineation was achieved for BTEX, TPH and chloride impacts.

On November 10, 2015, GHD and Chevron representatives met with NMOCD regarding further delineation activities requested by NMOCD addressing the presence of chloride concentrations within the existing excavation in proximity to former surface sample SS-2. An agreement was made by all parties that both further vertical delineation of surface soil sample SS-2 and addressing the existing excavation were necessary.

On January 14, 2016, GHD submitted a work plan to NMOCD proposing additional activities including: 1) installation of an additional soil boring (SB-3) to determine the vertical extent of chloride concentrations previously detected in surface soil sample (SS-2); and 2) lining and backfilling of the excavation. NMOCD approved the work plan on January 25, 2016.

On August 22, 2016, GHD returned to the Site and installed the additional boring (SB-3). Following drilling activities and chloride field screening results indicating no elevated chloride concentrations in soils at depth within soil boring SB-3, the previous excavation area was subsequently lined, backfilled with clean soil, fertilized, and seeded with a Bureau of Land Management-approved seed mixture.

The collective results of activities performed from 2014 through 2016 are presented in this comprehensive report.

3. Recommended Remediation Action Levels

Information available on the Petroleum Recovery Research Center (PRRC) Mapping Portal and the United States Geological Survey (USGS) Current Water Database for the Nation indicate: 1) the depth to groundwater at the Site is greater than 100 feet bgs; 2) the nearest private domestic water source is greater than 200-feet from the release site; 3) the nearest public/municipal water source is greater than 1,000-feet from the release site; and 4) the release site lies more than 1,000 horizontal feet from the nearest surface water body.

Consequently, the NMOCD total ranking criteria score is zero (0) for the Site. The anticipated site-specific Recommended Remediation Action Levels (RRALs) to be applied to this location by the NMOCD are 10 milligram per kilogram (mg/kg) for benzene; 50 mg/kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX); 5,000 mg/kg for TPH; and an NMOCD-accepted 500 mg/kg for chlorides.

In addition, GHD currently monitors two groundwater sites in proximity to the Site. The Buckeye Compressor Station Site and the Buckeye Vacuum Field Unit Site (AP-104) are located approximately 1 mile northwest of the Site. Upon review of groundwater gauging data pertaining to the Buckeye Compressor Station and Buckeye Vacuum Field Unit, it is suggested that the depth to groundwater at these two sites can be used to support the assessment of potential risks of impact to groundwater at this Site. Risks to groundwater from chloride impact in soil are believed minimal due to the depth of groundwater documented at over 130 feet bgs in the area. Recent gauging data for both sites are presented below.

Buckeye Compressor Station Site

The Buckeye Compressor Station Site is monitored with a network of 28 monitoring wells. Below is a table of recent groundwater gauging data for three of the wells within the network, the additional wells exhibit similar groundwater levels:

Table 1 Recent Groundwater Gauging Data

Well ID	Date	Depth To Water (fbtoc)
MW-1	8/22/2016	134.14
MW-2	8/22/2016	134.45
MW-3	8/22/2016	135.08

Buckeye Vacuum Field Unit Site

The Buckeye Vacuum Field Unit Site (AP-104) is monitored with a network of 13 monitoring and recovery wells. Below is a table of recent groundwater gauging data for three of the wells within the network, the additional wells exhibit similar groundwater levels:

Table 2 Recent Groundwater Gauging Data

Well ID	Date	Depth To Water (fbtoc)
TW-9	8/15/2016	130.51
TW-10	8/15/2016	132.65
TW-11	8/15/2016	130.50

4. Drilling and Sampling - 2014

On March 17, 2014 GHD and subcontractor Harrison Cooper Drilling Services, Inc. (HCI), a New Mexico licensed drilling company, mobilized to the Site to begin soil boring activities. Four soil borings were advanced on the north, south, east and west sides of the existing excavation with an air rotary drill rig. Soil borings were advanced to total depths of 50 feet bgs based on field screening for chlorides. Chloride concentrations in soil were field screened by mixing soil samples with distilled water. The rinsate was then screened using Hach chloride test strips.

Soil samples were collected for laboratory analysis from each boring (SB-1, SB-2, SB-3 and SB-4) at varying intervals beginning at the surface (0-feet bgs). Four surface soil samples (SS-1, SS-2, SS-3 and SS-4) were collected from the floor of the existing excavation, and four sidewall samples (SW-1, SW-2, SW-3, and SW-4) were collected at 2.5-feet bgs from within the existing excavation. Soil samples were analyzed for BTEX by EPA Method 8021B; TPH gasoline range organics (GRO) plus TPH diesel range organics (DRO) by EPA Method 8015B Modified; and for chloride analysis by EPA Method E300.0.

4.1 Analytical Results - 2014

BTEX results in all soil samples collected from the Site in 2014 were below laboratory reporting limits and RRALs. In addition, TPH and chloride concentrations of soil samples collected from borings located outside of the excavation (SB-1, SB-2, SB-3, and SB-4) were below site RRALs.

TPH results for surface samples collected on the excavation floor (SS-1 through SS-4) were below site RRALs. Chloride exceeded the RRAL in SS-2 at 8,100 mg/kg, and all remaining chloride concentrations (SS-1, SS-3 and SS-4) were below the RRAL.

Results of sidewall soil samples of the existing excavation (2.5-feet bgs) at SW-1 through SW-4 did not exceeded the RRAL for TPH. Results of SW-3 and SW-4 did exceed the RRAL for chloride (816 mg/kg and 977 mg/kg, respectively). Laboratory analytical results from GHD's 2014 activities and Crain's 2011 assessment are summarized in Table 1 and on Figure 3. Laboratory analytical reports are provided in Appendix D.

5. Drilling and Sampling – 2015 and 2016

On June 12, 2015, GHD and its contracted service provider, Lobo Services (Lobo's) of Odessa, Texas, mobilized to the Site to construct a dirt ramp for drill rig access into the shallow excavation. Lobo's utilized heavy machinery to dig, construct, and shape an extended dirt ramp into the existing excavation.

On August 19, 2015, GHD and subcontractor HCI mobilized to the Site to begin additional soil boring activities using an air rotary drill rig. Two soil borings (SB-1 and SB-2) were advanced to approximately 50 feet bgs within the existing excavation.

The soil types observed in samples collected during drilling of SB-1 and SB-2 in 2015 consisted of light gray, dense caliche interval, interbedded with poor to moderately cemented very fine grain sandstone from 5 feet bgs to approximately 18 feet bgs. Yellow to orange sand with caliche fragments was observed from approximately 20 feet to total depth (50 feet).

Soil samples were collected for laboratory analysis from each boring (SB-1 and SB-2) at varying intervals beginning at the surface (0 feet bgs) for analysis of TPH GRO plus TPH DRO by EPA Method 8015B Modified and for chloride analysis by EPA Method 300.0.

On August 22, 2016, GHD and subcontractor HCI returned to the Site and installed an additional boring (SB-3) to 53 feet bgs in order to define the vertical extent of chloride impact previously detected at the adjacent surface soil sample (SS-2) collected in 2014. The soil types observed during drilling of SB-3 in 2016 were similar to that of SB-1 and SB-2 described above, except the caliche interval was overlain by fine to very-fine grained sand from 5 to 13 feet, extended from 13 to 26 feet bgs, and was underlain by poorly cemented sandstone to 47 feet. Soil boring logs are provided in Appendix C.

The 2016 sampling activities were conducted consistent with the procedures described above for 2015 activities, except laboratory analysis was limited to chlorides. Laboratory analytical reports are provided in Appendix D.

5.1 Analytical Results – 2015 and 2016

Soil analytical results from 2015 and 2016 are presented in Table 2 and Figure 3. Results for all soil samples collected in 2015 were below laboratory reporting limits for TPH with the exception of a surface soil sample (0 feet bgs) at SB-1 (85.4 mg/L). All soil samples from 2015 were well below the Site RRALs for TPH (5,000 mg/kg) and chlorides (500 mg/kg). All soil samples collected at SB-

3 in 2016 were below the reporting limit for chloride. Laboratory analytical reports are provided in Appendix D.

6. Backfilling and Restoration

Following drilling activities, the excavation area was subsequently lined, backfilled, and seeded during August 2016. A 20-millimeter polyethylene liner was installed in the bottom of the excavation with liner seams overlapped a minimum of 24-inches. The excavation was backfilled to grade using clean fill material, and the area was fertilized and reseeded with a Bureau of Land Management-approved seed mix (seed mix #3). See Appendix B, Photographic Log.

7. Conclusions

A thorough subsurface investigation was implemented at the Site. Evaluation of the analytical data obtained from soil assessment and delineation activities performed in July 2014, August 2015 and August 2016 indicates that vertical and horizontal delineation of BTEX, TPH, and chloride impacts have been achieved at the Site. The excavation was backfilled and the land surface restored to its original condition. Based on data provided in this report, no further delineation or remedial efforts are warranted.

Figures

0 1000 2000ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LEA COUNTY, NEW MEXICO
ABO REEF GATHERING SYSTEM (AB TN9)

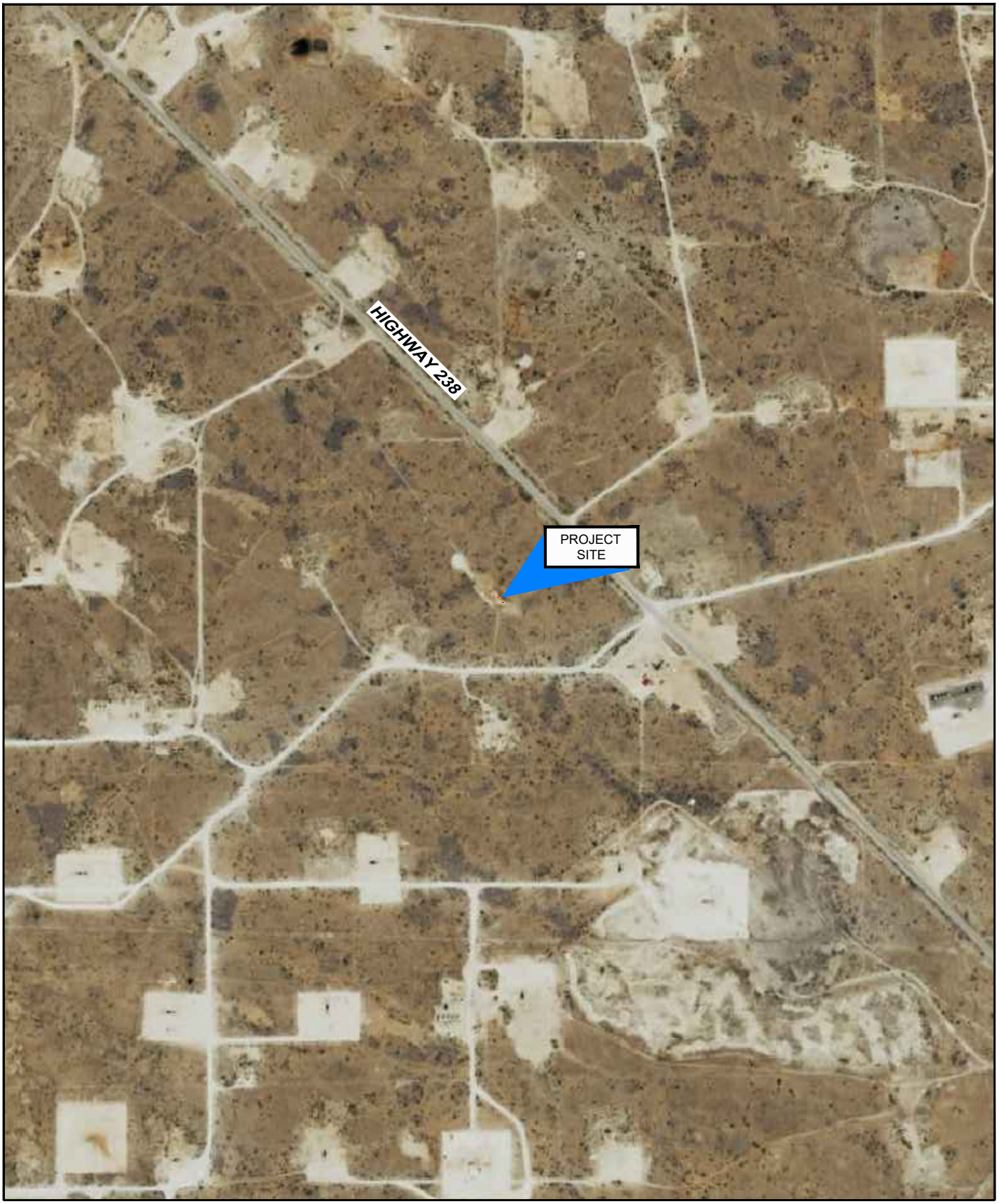
074638-00

Sep 14, 2015

SITE LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\07----\074---\074638-CEMC-Abo Reef Gathering System\074638-00\074638-00(003)\074638-00(003)GN-DL001.dwg



Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.7719° North, 103.4933° West

0 300 600ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LEA COUNTY, NEW MEXICO
ABO REEF GATHERING SYSTEM (AB TN9)

074638-00

Sep 14, 2015

SITE AERIAL MAP

FIGURE 2

CAD File: I:\CAD\Files\07----\074---\074638-CEMC-Abo Reef Gathering System\074638-00\074638-00(003)\074638-00(003)GN-DL001.dwg

NOTES:

1. Yellow shaded cells indicate NMOCD Recommended Remediation Action Level exceedance.
2. "<" indicates below laboratory detection limit.

Access Road

SB-3 03/17/14				
Depth	0'	15'	30'	50'
TPH (GRO + DRO)	136	<18.9	NS	NS
Chloride	12.6	5.32	7.20	3.00

SB-2 08/19/15								
Depth	0'	5'	10'	15'	20'	30'	40'	50'
TPH (GRO + DRO)	<22.0	<15.3	<15.7	<20.5	<17.1	<16.5	<16.8	<16.8
Chloride	24.7	20.4	15.9	16.7	27.4	6.87	7.89	10.6

SW-1	
Date	03/17/14
Depth	2.5'
TPH (GRO + DRO)	<15.6
Chloride	284

SS-1		
Date	01/18/11	03/17/14
Depth	Surface	Surface
TPH (GRO + DRO)	727	688
Chloride	160	10.5

SB-2 03/17/14				
Depth	0'	15'	30'	50'
TPH (GRO + DRO)	<22.7	<22.7	NS	NS
Chloride	18.2	6.39	8.07	15.5

SW-3	
Date	03/17/14
Depth	2.5'
TPH (GRO + DRO)	1,780
Chloride	816

SB-1 08/19/15								
Depth	0'	5'	10'	15'	20'	30'	40'	50'
TPH (GRO + DRO)	85.4	<18.1	<19.2	<16.8	<27.1	<23.8	18.4	<16.4
Chloride	60.9	8.81	5.31	6.05	9.07	5.55	18.0	20.4

SS-2		
Date	01/18/11	03/17/14
Depth	Surface	Surface
TPH (GRO + DRO)	17	33.9
Chloride	8,200	8,100

SW-2	
Date	03/17/14
Depth	2.5'
TPH (GRO + DRO)	<15.6
Chloride	54

SB-3 08/22/16				
Depth	5'	10'	20'	50'
TPH (GRO + DRO)	NS	NS	NS	NS
Chloride	<10	<10	<10	<10

SB-4 03/17/14				
Depth	0'	15'	30'	50'
TPH (GRO + DRO)	23.8	<15.3	NS	NS
Chloride	6.70	2.33	3.04	2.39

SW-4	
Date	03/17/14
Depth	2.5'
TPH (GRO + DRO)	1,160
Chloride	977

SB-1 03/17/14				
Depth	0'	15'	30'	50'
TPH (GRO + DRO)	<25.4	<25.4	NS	NS
Chloride	18.1	2.90	4.44	3.82

SS-3		
Date	01/18/11	03/17/14
Depth	Surface	Surface
TPH (GRO + DRO)	30	287
Chloride	160	61.9

SS-4	
Date	03/17/14
Depth	Surface
TPH (GRO + DRO)	979
Chloride	8.55

SB-3 SS-1 SB-2 SW-1 SW-3 SS-2 SB-4 SW-4 SS-3 SS-4 SW-2 SB-1

LEGEND

- Soil Boring Location - 2014
- Soil Boring Location - 2015 and 2016
- Soil Sample Location
- Sidewall Sample Location
- Approximate Area of Existing Excavation
- Underground Pipeline

Depth	Depth of Sample (ft)
TPH	Total Petroleum Hydrocarbons Concentration (mg/kg)
DRO	TPH as Diesel Range Organics
GRO	TPH as Gasoline Range Organics
NS	Indicates Not Sampled

Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.7719° North, 103.4933° West

0 15 30ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LEA COUNTY, NEW MEXICO
ABO REEF GATHERING SYSTEM (AB TN9)

074638-00

Sep 22, 2016

SITE DETAILS AND ANALYTICAL RESULTS MAP

FIGURE 3

CAD File: I:\CAD\Files\07----\074---\074638-CEMC-Abo Reef Gathering System\074638-00\074638-00(004)\074638-00(004)GN-DL001.dwg

Tables

Soil Analytical Summary - 2014
ABO Reef Gathering System (AB TN9)
Lea County, New Mexico

Sample ID	Depth	Date	Benzene	Toluene	Ethyl-Benzene	Xylenes	Total BTEX	TPH (SW 8015 Modified)			Chlorides
								GRO	DRO	GRO+DRO	
NMOCD Recommended Remediation Action Levels			**10 mg/kg**	**--- mg/kg**	**--- mg/kg**	**--- mg/kg**	**50 mg/kg**	**--- mg/kg**	**--- mg/kg**	**5,000 mg/kg**	**500 mg/kg**
SB-1	0'	3/17/14	<0.00169	<0.00169	<0.00169	<0.00169	<0.00169	<25.4	<25.4	<25.4	**18.1**
	15'	3/17/14	<0.00104	<0.00104	<0.00104	<0.00104	<0.00104	<25.4	<25.4	<25.4	**2.90**
	30'	3/17/14	--	--	--	--	--	--	--	--	**4.44**
	50'	3/17/14	--	--	--	--	--	--	--	--	**3.82**
SB-2	0'	3/17/14	<0.00151	<0.00151	<0.00151	<0.00151	<0.00151	<22.7	<22.7	<22.7	**18.2**
	15'	3/17/14	<0.00110	<0.00110	<0.00110	<0.00110	<0.00110	<22.7	<22.7	<22.7	**6.39**
	30'	3/17/14	--	--	--	--	--	--	--	--	**8.07**
	50'	3/17/14	--	--	--	--	--	--	--	--	**15.5**
SB-3	0'	3/17/14	<0.00155	<0.00155	<0.00155	<0.00155	<0.00155	<23.4	136	136	**12.6**
	15'	3/17/14	<0.00126	<0.00126	<0.00126	<0.00126	<0.00126	<18.9	<18.9	<18.9	**5.32**
	30'	3/17/14	--	--	--	--	--	--	--	--	**7.20**
	50'	3/17/14	--	--	--	--	--	--	--	--	**3.00**
SB-4	0'	3/17/14	<0.00101	<0.00101	<0.00101	<0.00101	<0.00101	<15.2	23.8	23.8	**6.70**
	15'	3/17/14	<0.00102	<0.00102	<0.00102	<0.00102	<0.00102	<15.3	<15.3	<15.3	**2.33**
	30'	3/17/14	--	--	--	--	--	--	--	--	**3.04**
	50'	3/17/14	--	--	--	--	--	--	--	--	**2.39**
SS-1 (Crain)	Surface	1/18/11	--	--	--	--	--	**31.2**	**696**	**727.2**	**160**
SS-1	Surface	3/17/14	<0.00107	<0.00107	<0.00107	<0.00107	<0.00107	<16.0	**633**	**688**	**10.5**
SS-2 (Crain)	Surface	1/18/11	--	--	--	--	--	<10.0	**17.0**	**17.0**	**8200**
SS-2	Surface	3/17/14	<0.00112	<0.00112	<0.00112	<0.00112	<0.00112	<16.8	**33.9**	**33.9**	**8100**
SS-3 (Crain)	Surface	1/18/11	--	--	--	--	--	<10.0	**30.3**	**30.3**	**160**
SS-3	Surface	3/17/14	<0.00108	<0.00108	<0.00108	<0.00108	<0.00108	<16.3	**262**	**287**	**61.9**
SS-4	Surface	3/17/14	<0.00108	<0.00108	<0.00108	<0.00108	<0.00108	<16.2	**908**	**979**	**8.55**
SW-1	2.5'	3/17/14	<0.00103	<0.00103	<0.00103	<0.00103	<0.00103	<15.6	<15.6	<15.6	**284**
SW-2	2.5'	3/17/14	<0.00103	<0.00103	<0.00103	<0.00103	<0.00103	<15.6	<15.6	<15.6	**54.3**
SW-3	2.5'	3/17/14	<0.00115	<0.00115	<0.00115	<0.00115	<0.00115	**56.0**	**1610**	**1780**	**816**
SW-4	2.5'	3/17/14	<0.00104	<0.00104	<0.00104	<0.00104	<0.00104	<15.6	**983**	**1160**	**977**

Notes:
All analytical results reported in (mg/kg) milligrams per kilogram
Chloride analyses by Method EPA 300.0
BTEX analysis by Method EPA 8021 B
TPH analysis by Method SW 8015 Modified
Highlighted cells indicate concentrations exceeding guidance RRALs
bgs - below ground surface
'--' indicates sample was not analyzed
'<' indicates below laboratory Reporting Limit (RL)
'SB' indicates Soil Borings; 'SS' indicates Soil Sample; 'SW' indicates Side Wall

Soil Analytical Summary, 2015 - 2016
ABO Reef Gathering System (AB TN9)
Lea County, New Mexico

Sample ID	Depth	Date	TPH (SW 8015 Modified)			Chlorides
			GRO	DRO	GRO+DRO	
NMOCD Recommended Remediation Action Levels			**---** mg/kg	**---** mg/kg	**5,000** mg/kg	**500** mg/kg
SB-1	0'	8/19/15	<17.4	**85.4**	**85.4**	**60.9**
	5'	8/19/15	<18.1	<18.1	<18.1	**8.81**
	10'	8/19/15	<19.2	<19.2	<19.2	**5.31**
	15'	8/19/15	<16.8	<16.8	<16.8	**6.05**
	20'	8/19/15	<27.1	<27.1	<27.1	**9.07**
	30'	8/19/15	<23.8	<23.8	<23.8	**5.55**
	40'	8/19/15	**18.4**	<16.8	**18.4**	**18.0**
	50'	8/19/15	<16.4	<16.4	<16.4	**20.4**
SB-2	0'	8/19/15	<22.0	<22.0	<22.0	**24.7**
	5'	8/19/15	<15.3	<15.3	<15.3	**20.4**
	10'	8/19/15	<15.7	<15.7	<15.7	**15.9**
	15'	8/19/15	<20.5	<20.5	<20.5	**16.7**
	20'	8/19/15	<17.1	<17.1	<17.1	**27.4**
	30'	8/19/15	<16.5	<16.5	<16.5	**6.87**
	40'	8/19/15	<16.8	<16.8	<16.8	**7.89**
	50'	8/19/15	<16.8	<16.8	<16.8	**10.6**
SB-3	5'	8/22/16	NT	NT	NT	<10
	10'	8/22/16	NT	NT	NT	<10
	20'	8/22/16	NT	NT	NT	<10
	50'	8/22/16	NT	NT	NT	<10

Notes:

- All analytical results reported in (mg/kg) milligrams per kilogram
- Chloride analyses by Method EPA 300.0
- TPH analysis by Method SW 8015B Modified
- bgs - below ground surface
- Bold numbers indicate detected concentrations.
- < indicates below laboratory Reporting Limit (RL)
- 'NT' indicates constituent was not tested.
- 'SB' indicates soil boring

Appendices

Appendix A
Original Form C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR X Initial Report Final Report

Name of Company Chevron USA	Contact Josie DeLeon
Address 56 Texas Camp Rd. Lovington, N.M. 88260	Telephone No. 575-396-4414 X 222
Facility Name: NM State AB TN9 - Abo Reef	Facility Type Oil Well

Surface Owner NM	Mineral Owner NM	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	South Line	Feet from the	East Line	County
								Lea

Latitude: 32.46.459 / Longitude: -103.29.588

NATURE OF RELEASE

API #

Type of Release Spill	Volume of Release 1.565 Bbls oil: 34.696 Bbls water	Volume Recovered 0
Source of Release Gas Gathering Trunkline Spill	Date and Hour of Occurrence 1-3-11 12:00 p.m.	Date and Hour of Discovery 1-3-11 12:00 p.m.
Was Immediate Notice Given? Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.* The watercourse was not impacted.

Describe Cause of Problem and Remedial Action Taken.*
Per Tejay Simpson, the source of the leak is a gas gathering line that was supposed to be out of service. It was damaged during the grass fire last year. It appears the old gas gathering system casing valve got opened at AB-9 and the check valve on gathering system leaked allowing gas to vent out of the pipe where it had been burned. It would be somewhat expected to have water condense and come out of the gas. I suspect the oil came from a leaking wellhead check valve at the well. Not leaking at the time Carlos inspected. The valves at the wells that provide access to the gas gathering should have been closed and operations locks installed. Failed line section is now isolated and gathering systm can be reactivated

Describe Area Affected and Cleanup Action Taken.

Isolation valves were closed and locked. The gathering system branch that was damaged was disconnected and access capped off. Free standing fluid was recovered.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION
Printed Name: Josie DeLeon	Approved by District Supervisor:
Title: Operations : Safety Specialist	Approval Date: / Expiration Date:
E-mail Address jdxd@chevron.com	Conditions of Approval: / Attached ☐
Date: January 7, 2011 Phone: 396-4414 X 222	

* Attach Additional Sheets If Necessary

Appendix B
Photographic Log

Photo 1 – View of liner placed within former excavation area.

Photo 2 – View of former excavation area following initial backfilling activities.

Site Photographs

Photo 3 – View of former excavation area following top soil placement and re-seeding activities.

Photo 4 – Additional view of former excavation following re-seeding activities.

Site Photographs

Appendix C
Soil Boring Logs

STRATIGRAPHIC LOG

PROJECT NAME: Abo Reef Gathering System
PROJECT NUMBER: 074638
CLIENT: CEMC
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-1
DATE COMPLETED: August 19, 2015
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: J. Fergerson

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE USCS
0	Clayey SILT, dull brown, unconsolidated with caliche in matrix, dry			AIR	1.0	ML
5	Caliche, light brownish gray, dense-weathered, dry	5.00		AIR	1.0	
10				AIR	1.0	
15	becomes light yellowish orange, interbedded with poor to moderately cemented very fine grained sandstone			AIR	1.0	
18	SAND, light yellowish orange, very fine grained, unconsolidated with broken caliche in matrix, interbedded with poor-moderately cemented very fine grained sandstone, dry	18.00		AIR	1.0	SP
20				AIR	1.0	
24				AIR		

NOTES:

STRATIGRAPHIC LOG

PROJECT NAME: Abo Reef Gathering System
PROJECT NUMBER: 074638
CLIENT: CEMC
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-1
DATE COMPLETED: August 19, 2015
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: J. Fergerson

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	INTERVAL	REC (ft)	USCS
28	becomes dull orange, very fine grained, unconsolidated, interbedded with poor-moderately cemented very fine grained sandstone, slightly moist			AIR	1.0	
30						
32				AIR	1.0	
34						
36						
38	becomes moderately to well cemented very fine grained sandstone			AIR	1.0	
40						
42				AIR	1.0	
44						
46						
48				AIR	1.0	
50	BOREHOLE TERMINATED @ 50.0ft BGS	50.00				

NOTES:

STRATIGRAPHIC LOG

PROJECT NAME: Abo Reef Gathering System
PROJECT NUMBER: 074638
CLIENT: CEMC
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-2
DATE COMPLETED: August 19, 2015
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: J. Fergerson

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	INTERVAL	REC (ft)	USCS
0	Clayey SILT, dull brown, unconsolidated with caliche in matrix, dry			AIR	1.0	ML
5	Caliche, light brownish gray, dense-weathered, dry	5.00		AIR	1.0	
10	becomes light yellowish orange, weathered-dense, interbedded with poor to moderately cemented very fine grained sandstone			AIR	1.0	
15				AIR	1.0	
18	SAND, light yellowish orange, very fine grained, unconsolidated with broken caliche in matrix, interbedded with poor-moderately cemented very fine grained sandstone, dry	18.00		AIR	1.0	SP
20						
22				AIR	1.0	
24				AIR		

NOTES:

STRATIGRAPHIC LOG

PROJECT NAME: Abo Reef Gathering System
PROJECT NUMBER: 074638
CLIENT: CEMC
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-2
DATE COMPLETED: August 19, 2015
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: J. Fergerson

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	INTERVAL	REC (ft)	USCS
28	becomes dull orange, very fine grained, unconsolidated, interbedded with poor-moderately cemented very fine grained sandstone, slightly moist			AIR	1.0	
30						
32				AIR	1.0	
34						
36						
38	becomes moderately to well cemented very fine grained sandstone			AIR	1.0	
40						
42				AIR	1.0	
44						
46						
48				AIR	1.0	
50	BOREHOLE TERMINATED @ 50.0ft BGS	50.00				

NOTES:

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: Abo Reef Gathering System
HOLE DESIGNATION: SB-3
PROJECT NUMBER: 74638
DATE COMPLETED: 22 August 2016
CLIENT: Chevron Environmental Management Company
DRILLING METHOD: Air Rotary
LOCATION: Lea County, New Mexico
FIELD PERSONNEL: J. Stoffel
DRILLING COMPANY: Harrison & Cooper, Inc.

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE PID (ppm)
2	SILTY SAND (SM); dull yellow-brown, fine to very-fine grained, loose, dry, no hydrocarbon odor (native soil)						
		3.00					
4	SAND (SP); dull yellow-orange, fine to very-fine grained, loose, dry, interbedded with caliche, well graded with granule-to-pebble sized well cemented sandstone, no hydrocarbon odor		5 ft				
6							
8							0
10			10 ft				
12							
		13.00					
14	CALICHE; light yellow-gray, weathered, dense, loose, no hydrocarbon odor						0
16							
18							
20			20 ft				
22							0
24							
		26.00					
26	SANDSTONE; dull yellow-orange, fine to very-fine grained, loose, dry, poorly cemented, well sorted, no hydrocarbon odor						
28	- with minor amount moderately-cemented caliche						
30							
32	- dull orange						0
34							

NOTES: Boring spudded at 3 feet depth in previous excavation. Stratigraphy descriptions are based on drill cuttings collected at approximate 5-foot intervals.

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074638.GPJ CRA_CORP.GDT 22/9/16

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: Abo Reef Gathering System
HOLE DESIGNATION: SB-3
PROJECT NUMBER: 74638
DATE COMPLETED: 22 August 2016
CLIENT: Chevron Environmental Management Company
DRILLING METHOD: Air Rotary
LOCATION: Lea County, New Mexico
FIELD PERSONNEL: J. Stoffel
DRILLING COMPANY: Harrison & Cooper, Inc.

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE PID (ppm)
36	- light yellow, poorly to moderately cemented						
38							
40							
42	- dull yellow-orange						0
44							
46							
48	SAND (SP); dull yellow-orange, fine to very-fine grained, loose, dry, poorly cemented and well sorted, interbedded with moderately cemented very-fine granied sandstone, no hydrocarbon odor	47.00					
50	- dark yellow-brown		50 ft				
52							0
54	END OF BOREHOLE @ 53.0ft BGS	53.00					
56							
58							
60							
62							
64							
66							
68							

NOTES: Boring spudded at 3 feet depth in previous excavation. Stratigraphy descriptions are based on drill cuttings collected at approximate 5-foot intervals.

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074638.GPJ CRA_CORP.GDT 22/9/16

Appendix D
Laboratory Analytical Reports

Analytical Report 481523

for

Conestoga Rovers & Associates

Project Manager: Jacob Ferenz

ABO Reef Gathering System

074638

28-MAR-14

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-14-16-TX), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
New Jersey (TX007), North Carolina(681), Oklahoma (9218), Pennsylvania (68-03610)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

28-MAR-14

Project Manager: **Jacob Ferenz**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **481523**
ABO Reef Gathering System
Project Address:

Jacob Ferenz:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 481523. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 481523 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America

Sample Cross Reference 481523

Conestoga Rovers & Associates, Midland, TX

ABO Reef Gathering System

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
074638-JMF-SB1	S	03-17-14 11:25	- 0 ft	481523-001
074638-JMF-SB1	S	03-17-14 11:34	- 15 ft	481523-002
074638-JMF-SB1	S	03-17-14 11:44	- 30 ft	481523-003
074638-JMF-SB1	S	03-17-14 12:06	- 50 ft	481523-004
074638-JMF-SB2	S	03-17-14 13:00	- 0 ft	481523-005
074638-JMF-SB2	S	03-17-14 13:12	- 15 ft	481523-006
074638-JMF-SB2	S	03-17-14 13:14	- 30 ft	481523-007
074638-JMF-SB2	S	03-17-14 13:29	- 50 ft	481523-008
074638-JMF-SB3	S	03-17-14 14:08	- 0 ft	481523-009
074638-JMF-SB3	S	03-17-14 14:13	- 15 ft	481523-010
074638-JMF-SB3	S	03-17-14 14:17	- 30 ft	481523-011
074638-JMF-SB3	S	03-17-14 14:33	- 50 ft	481523-012
074638-JMF-SB4	S	03-17-14 15:06	- 0 ft	481523-013
074638-JMF-SB4	S	03-17-14 15:12	- 15 ft	481523-014
074638-JMF-SB4	S	03-17-14 15:14	- 30 ft	481523-015
074638-JMF-SB4	S	03-17-14 15:35	- 50 ft	481523-016
074638-JMF-SS1	S	03-17-14 15:58	- 3.5 ft	481523-017
074638-JMF-SS2	S	03-17-14 16:00	- 3.5 ft	481523-018
074638-JMF-SS3	S	03-17-14 16:02	- 3.5 ft	481523-019
074638-JMF-SS4	S	03-17-14 16:04	- 3.5 ft	481523-020
074638-JMF-SW1	S	03-17-14 16:08	- 2.5 ft	481523-021
074638-JMF-SW2	S	03-17-14 16:11	- 2.5 ft	481523-022
074638-JMF-SW3	S	03-17-14 16:14	- 2.5 ft	481523-023
074638-JMF-SW4	S	03-17-14 16:16	- 2.5 ft	481523-024

CASE NARRATIVE

Client Name: Conestoga Rovers & Associates

Project Name: ABO Reef Gathering System

Project ID: *074638*
Work Order Number(s): *481523*

Report Date: *28-MAR-14*
Date Received: *03/19/2014*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-937197 Inorganic Anions by EPA 300/300.1

Chloride recovered above QC limits in the Matrix Spike. Samples affected are: 481523-023, -024, -021, -022, -020.

The Laboratory Control Sample for Chloride is within laboratory Control Limits. No further action required.

Certificate of Analysis Summary 481523

Conestoga Rovers & Associates, Midland, TX

Project Name: ABO Reef Gathering System

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Wed Mar-19-14 12:25 pm
Report Date: 28-MAR-14
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	481523-001		481523-002		481523-003		481523-004		481523-005		481523-006	
	Field Id:	074638-JMF-SB1		074638-JMF-SB1		074638-JMF-SB1		074638-JMF-SB1		074638-JMF-SB2		074638-JMF-SB2	
	Depth:	0 ft		15 ft		30 ft		50 ft		0 ft		15 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-17-14 11:25		Mar-17-14 11:34		Mar-17-14 11:44		Mar-17-14 12:06		Mar-17-14 13:00		Mar-17-14 13:12	
BTEX by EPA 8021B	***Extracted:***	Mar-22-14 14:00		Mar-22-14 14:00						Mar-22-14 14:00		Mar-22-14 14:00	
	Analyzed:	Mar-22-14 17:31		Mar-22-14 17:46						Mar-22-14 18:02		Mar-22-14 18:19	
	Units/RL:	mg/kg	RL	mg/kg	RL					mg/kg	RL	mg/kg	RL
Benzene		ND	0.00169	ND	0.00104					ND	0.00151	ND	0.00110
Toluene		ND	0.00339	ND	0.00209					ND	0.00301	ND	0.00220
Ethylbenzene		ND	0.00169	ND	0.00104					ND	0.00151	ND	0.00110
m_p-Xylenes		ND	0.00339	ND	0.00209					ND	0.00301	ND	0.00220
o-Xylene		ND	0.00169	ND	0.00104					ND	0.00151	ND	0.00110
Total Xylenes		ND	0.00169	ND	0.00104					ND	0.00151	ND	0.00110
Total BTEX		ND	0.00169	ND	0.00104					ND	0.00151	ND	0.00110
Inorganic Anions by EPA 300/300.1	***Extracted:***	Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30	
	Analyzed:	Mar-26-14 11:22		Mar-26-14 12:08		Mar-26-14 12:31		Mar-26-14 12:53		Mar-26-14 13:16		Mar-26-14 13:39	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		18.1	6.78	2.90	2.10	4.44	3.03	3.82	2.08	18.2	6.06	6.39	2.21
Percent Moisture	***Extracted:***												
	Analyzed:	Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		41.0	1.00	4.90	1.00	33.9	1.00	3.88	1.00	34.0	1.00	9.63	1.00
TPH By SW8015 Mod	***Extracted:***	Mar-20-14 15:00		Mar-20-14 15:00						Mar-20-14 15:00		Mar-20-14 15:00	
	Analyzed:	Mar-20-14 21:53		Mar-20-14 22:20						Mar-20-14 23:39		Mar-21-14 00:05	
	Units/RL:	mg/kg	RL	mg/kg	RL					mg/kg	RL	mg/kg	RL
C6-C12 Gasoline Range Hydrocarbons		ND	25.4	ND	15.7					ND	22.7	ND	16.6
C12-C28 Diesel Range Hydrocarbons		ND	25.4	ND	15.7					ND	22.7	ND	16.6
Total TPH		ND	25.4	ND	15.7					ND	22.7	ND	16.6

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 481523

Conestoga Rovers & Associates, Midland, TX

Project Name: ABO Reef Gathering System

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Wed Mar-19-14 12:25 pm
Report Date: 28-MAR-14
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	481523-007		481523-008		481523-009		481523-010		481523-011		481523-012	
	Field Id:	074638-JMF-SB2		074638-JMF-SB2		074638-JMF-SB3		074638-JMF-SB3		074638-JMF-SB3		074638-JMF-SB3	
	Depth:	30 ft		50 ft		0 ft		15 ft		30 ft		50 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-17-14 13:14		Mar-17-14 13:29		Mar-17-14 14:08		Mar-17-14 14:13		Mar-17-14 14:17		Mar-17-14 14:33	
BTEX by EPA 8021B	***Extracted:***					Mar-24-14 09:00		Mar-24-14 09:00					
	Analyzed:					Mar-24-14 13:59		Mar-24-14 14:15					
	Units/RL:					mg/kg	RL	mg/kg	RL				
Benzene						ND	0.00155	ND	0.00126				
Toluene						ND	0.00310	ND	0.00252				
Ethylbenzene						ND	0.00155	ND	0.00126				
m_p-Xylenes						ND	0.00310	ND	0.00252				
o-Xylene						ND	0.00155	ND	0.00126				
Total Xylenes						ND	0.00155	ND	0.00126				
Total BTEX						ND	0.00155	ND	0.00126				
Inorganic Anions by EPA 300/300.1	***Extracted:***	Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30	
	Analyzed:	Mar-26-14 14:47		Mar-26-14 15:09		Mar-26-14 15:32		Mar-26-14 15:55		Mar-26-14 16:18		Mar-26-14 17:03	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		8.07	2.72	15.5	4.19	12.6	6.24	5.32	2.53	7.20	3.12	3.00	2.10
Percent Moisture	***Extracted:***												
	Analyzed:	Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		26.4	1.00	4.52	1.00	35.9	1.00	21.0	1.00	35.9	1.00	4.75	1.00
TPH By SW8015 Mod	***Extracted:***					Mar-20-14 15:00		Mar-20-14 15:00					
	Analyzed:					Mar-21-14 00:57		Mar-21-14 01:23					
	Units/RL:					mg/kg	RL	mg/kg	RL				
C6-C12 Gasoline Range Hydrocarbons						ND	23.4	ND	18.9				
C12-C28 Diesel Range Hydrocarbons						136	23.4	ND	18.9				
Total TPH						136	23.4	ND	18.9				

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 481523

Conestoga Rovers & Associates, Midland, TX

Project Name: ABO Reef Gathering System

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Wed Mar-19-14 12:25 pm
Report Date: 28-MAR-14
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	481523-013		481523-014		481523-015		481523-016		481523-017		481523-018	
	Field Id:	074638-JMF-SB4		074638-JMF-SB4		074638-JMF-SB4		074638-JMF-SB4		074638-JMF-SS1		074638-JMF-SS2	
	Depth:	0 ft		15 ft		30 ft		50 ft		3.5 ft		3.5 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-17-14 15:06		Mar-17-14 15:12		Mar-17-14 15:14		Mar-17-14 15:35		Mar-17-14 15:58		Mar-17-14 16:00	
BTEX by EPA 8021B	***Extracted:***	Mar-22-14 14:00		Mar-22-14 14:00						Mar-22-14 14:00		Mar-22-14 14:00	
	Analyzed:	Mar-22-14 19:07		Mar-22-14 19:23						Mar-22-14 19:39		Mar-22-14 19:55	
	Units/RL:	mg/kg	RL	mg/kg	RL					mg/kg	RL	mg/kg	RL
Benzene		ND	0.00101	ND	0.00102					ND	0.00107	ND	0.00112
Toluene		ND	0.00203	ND	0.00204					ND	0.00214	ND	0.00223
Ethylbenzene		ND	0.00101	ND	0.00102					ND	0.00107	ND	0.00112
m_p-Xylenes		ND	0.00203	ND	0.00204					ND	0.00214	ND	0.00223
o-Xylene		ND	0.00101	ND	0.00102					ND	0.00107	ND	0.00112
Total Xylenes		ND	0.00101	ND	0.00102					ND	0.00107	ND	0.00112
Total BTEX		ND	0.00101	ND	0.00102					ND	0.00107	ND	0.00112
Inorganic Anions by EPA 300/300.1	***Extracted:***	Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30		Mar-25-14 09:30	
	Analyzed:	Mar-26-14 17:26		Mar-26-14 17:48		Mar-26-14 18:11		Mar-26-14 19:19		Mar-26-14 19:42		Mar-26-14 20:04	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		6.70	4.07	2.33	2.05	3.04	2.57	2.39	2.12	10.5	4.28	8100	1120
Percent Moisture	***Extracted:***												
	Analyzed:	Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05		Mar-24-14 13:05	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		1.61	1.00	2.37	1.00	22.3	1.00	5.55	1.00	6.64	1.00	10.8	1.00
TPH By SW8015 Mod	***Extracted:***	Mar-20-14 15:00		Mar-20-14 15:00						Mar-20-14 15:00		Mar-20-14 15:00	
	Analyzed:	Mar-21-14 01:46		Mar-21-14 02:13						Mar-21-14 02:36		Mar-21-14 03:03	
	Units/RL:	mg/kg	RL	mg/kg	RL					mg/kg	RL	mg/kg	RL
C6-C12 Gasoline Range Hydrocarbons		ND	15.2	ND	15.3					ND	16.0	ND	16.8
C12-C28 Diesel Range Hydrocarbons		23.8	15.2	ND	15.3					633	16.0	33.9	16.8
Total TPH		23.8	15.2	ND	15.3					688	16.0	33.9	16.8

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 481523

Conestoga Rovers & Associates, Midland, TX

Project Name: ABO Reef Gathering System

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Wed Mar-19-14 12:25 pm
Report Date: 28-MAR-14
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	481523-019		481523-020		481523-021		481523-022		481523-023		481523-024	
	Field Id:	074638-JMF-SS3		074638-JMF-SS4		074638-JMF-SW1		074638-JMF-SW2		074638-JMF-SW3		074638-JMF-SW4	
	Depth:	3.5 ft		3.5 ft		2.5 ft		2.5 ft		2.5 ft		2.5 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-17-14 16:02		Mar-17-14 16:04		Mar-17-14 16:08		Mar-17-14 16:11		Mar-17-14 16:14		Mar-17-14 16:16	
BTEX by EPA 8021B	***Extracted:***	Mar-22-14 14:00		Mar-22-14 14:00		Mar-22-14 14:00		Mar-22-14 14:00		Mar-22-14 14:00		Mar-22-14 14:00	
	Analyzed:	Mar-22-14 20:44		Mar-22-14 21:00		Mar-22-14 21:16		Mar-22-14 21:32		Mar-22-14 21:48		Mar-22-14 22:03	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		ND	0.00108	ND	0.00108	ND	0.00103	ND	0.00103	ND	0.00115	ND	0.00104
Toluene		ND	0.00217	ND	0.00216	ND	0.00207	ND	0.00206	ND	0.00230	ND	0.00207
Ethylbenzene		ND	0.00108	ND	0.00108	ND	0.00103	ND	0.00103	ND	0.00115	ND	0.00104
m_p-Xylenes		ND	0.00217	ND	0.00216	ND	0.00207	ND	0.00206	ND	0.00230	ND	0.00207
o-Xylene		ND	0.00108	ND	0.00108	ND	0.00103	ND	0.00103	ND	0.00115	ND	0.00104
Total Xylenes		ND	0.00108	ND	0.00108	ND	0.00103	ND	0.00103	ND	0.00115	ND	0.00104
Total BTEX		ND	0.00108	ND	0.00108	ND	0.00103	ND	0.00103	ND	0.00115	ND	0.00104
Inorganic Anions by EPA 300/300.1	***Extracted:***	Mar-25-14 09:30		Mar-26-14 09:30		Mar-26-14 09:30		Mar-26-14 09:30		Mar-26-14 09:30		Mar-26-14 09:30	
	Analyzed:	Mar-26-14 20:27		Mar-27-14 14:14		Mar-26-14 22:43		Mar-26-14 23:29		Mar-26-14 23:51		Mar-27-14 00:14	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		61.9	4.37	8.55	4.32	284	10.4	54.3	10.3	816	23.0	977	41.6
Percent Moisture	***Extracted:***												
	Analyzed:	Mar-24-14 13:05		Mar-24-14 17:20		Mar-24-14 17:20		Mar-24-14 17:20		Mar-24-14 17:20		Mar-24-14 17:20	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		8.38	1.00	7.51	1.00	3.67	1.00	3.35	1.00	13.2	1.00	3.76	1.00
TPH By SW8015 Mod	***Extracted:***	Mar-20-14 15:00		Mar-20-14 15:00		Mar-20-14 15:00		Mar-20-14 15:00		Mar-21-14 17:00		Mar-21-14 17:00	
	Analyzed:	Mar-21-14 03:27		Mar-21-14 03:54		Mar-21-14 04:18		Mar-21-14 04:44		Mar-21-14 20:42		Mar-21-14 21:07	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Gasoline Range Hydrocarbons		ND	16.3	ND	16.2	ND	15.6	ND	15.5	56.0	17.2	ND	15.6
C12-C28 Diesel Range Hydrocarbons		262	16.3	908	16.2	ND	15.6	ND	15.5	1610	17.2	983	15.6
Total TPH		287	16.3	979	16.2	ND	15.6	ND	15.5	1780	17.2	1160	15.6

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936718 **Sample:** 481523-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/20/14 21:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.3	99.8	79	70-135	
o-Terphenyl	42.1	49.9	84	70-135	

Lab Batch #: 936718 **Sample:** 481523-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/20/14 22:20

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.1	99.8	93	70-135	
o-Terphenyl	48.3	49.9	97	70-135	

Lab Batch #: 936718 **Sample:** 481523-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/20/14 23:39

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.5	99.8	97	70-135	
o-Terphenyl	51.0	49.9	102	70-135	

Lab Batch #: 936718 **Sample:** 481523-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 00:05

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.5	99.9	98	70-135	
o-Terphenyl	51.2	50.0	102	70-135	

Lab Batch #: 936718 **Sample:** 481523-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 00:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.6	99.9	94	70-135	
o-Terphenyl	47.4	50.0	95	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523,

Project ID: 074638

Lab Batch #: 936718 **Sample:** 481523-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 01:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.2	99.6	97	70-135	
o-Terphenyl	49.5	49.8	99	70-135	

Lab Batch #: 936718 **Sample:** 481523-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 01:46

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.4	99.7	78	70-135	
o-Terphenyl	38.9	49.9	78	70-135	

Lab Batch #: 936718 **Sample:** 481523-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 02:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.5	99.8	93	70-135	
o-Terphenyl	46.2	49.9	93	70-135	

Lab Batch #: 936718 **Sample:** 481523-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 02:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.4	99.8	91	70-135	
o-Terphenyl	50.0	49.9	100	70-135	

Lab Batch #: 936718 **Sample:** 481523-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 03:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.8	99.8	80	70-135	
o-Terphenyl	41.0	49.9	82	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523,

Project ID: 074638

Lab Batch #: 936718 **Sample:** 481523-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 03:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.6	99.6	84	70-135	
o-Terphenyl	43.1	49.8	87	70-135	

Lab Batch #: 936718 **Sample:** 481523-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 03:54

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.3	99.7	96	70-135	
o-Terphenyl	54.3	49.9	109	70-135	

Lab Batch #: 936718 **Sample:** 481523-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 04:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.9	99.9	91	70-135	
o-Terphenyl	47.5	50.0	95	70-135	

Lab Batch #: 936718 **Sample:** 481523-022 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 04:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.5	99.9	92	70-135	
o-Terphenyl	46.8	50.0	94	70-135	

Lab Batch #: 936868 **Sample:** 481523-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 20:42

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.2	99.7	94	70-135	
o-Terphenyl	58.0	49.9	116	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936868 **Sample:** 481523-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 21:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.2	99.8	97	70-135	
o-Terphenyl	53.4	49.9	107	70-135	

Lab Batch #: 936861 **Sample:** 481523-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 17:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	80-120	

Lab Batch #: 936861 **Sample:** 481523-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 17:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 936861 **Sample:** 481523-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 18:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 936861 **Sample:** 481523-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 18:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0306	0.0300	102	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936861 **Sample:** 481523-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 19:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 936861 **Sample:** 481523-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 19:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 936861 **Sample:** 481523-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 19:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 936861 **Sample:** 481523-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 19:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0311	0.0300	104	80-120	

Lab Batch #: 936861 **Sample:** 481523-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 20:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936861 **Sample:** 481523-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 21:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

Lab Batch #: 936861 **Sample:** 481523-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 21:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0265	0.0300	88	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 936861 **Sample:** 481523-022 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 21:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

Lab Batch #: 936861 **Sample:** 481523-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 21:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	80-120	
4-Bromofluorobenzene	0.0308	0.0300	103	80-120	

Lab Batch #: 936861 **Sample:** 481523-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 22:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0302	0.0300	101	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936919 **Sample:** 481523-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/24/14 13:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 936919 **Sample:** 481523-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/24/14 14:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0309	0.0300	103	80-120	

Lab Batch #: 936718 **Sample:** 652765-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/20/14 18:12

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.1	100	77	70-135	
o-Terphenyl	42.2	50.0	84	70-130	

Lab Batch #: 936868 **Sample:** 652882-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/21/14 19:28

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.6	100	78	70-135	
o-Terphenyl	39.6	50.0	79	70-130	

Lab Batch #: 936861 **Sample:** 652876-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/22/14 15:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936919 **Sample:** 652884-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/24/14 12:21

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0306	0.0300	102	80-120	

Lab Batch #: 936718 **Sample:** 652765-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/20/14 18:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	100	103	70-135	
o-Terphenyl	53.1	50.0	106	70-130	

Lab Batch #: 936868 **Sample:** 652882-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/21/14 19:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	53.2	50.0	106	70-130	

Lab Batch #: 936861 **Sample:** 652876-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/22/14 16:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0294	0.0300	98	80-120	
4-Bromofluorobenzene	0.0338	0.0300	113	80-120	

Lab Batch #: 936919 **Sample:** 652884-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/24/14 12:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936718 **Sample:** 652765-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/20/14 18:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.8	100	86	70-135	
o-Terphenyl	49.7	50.0	99	70-130	

Lab Batch #: 936868 **Sample:** 652882-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/21/14 20:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	53.9	50.0	108	70-130	

Lab Batch #: 936861 **Sample:** 652876-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/22/14 16:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0294	0.0300	98	80-120	
4-Bromofluorobenzene	0.0342	0.0300	114	80-120	

Lab Batch #: 936919 **Sample:** 652884-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/24/14 12:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 936718 **Sample:** 481523-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/20/14 22:45

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.2	99.7	93	70-135	
o-Terphenyl	54.1	49.9	108	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936868 **Sample:** 481586-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 21:59

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.8	106	70-135	
o-Terphenyl	61.3	49.9	123	70-130	

Lab Batch #: 936861 **Sample:** 481523-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 16:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0312	0.0300	104	80-120	

Lab Batch #: 936919 **Sample:** 481704-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/24/14 13:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0264	0.0300	88	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 936718 **Sample:** 481523-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/20/14 23:12

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	60.8	50.0	122	70-130	

Lab Batch #: 936868 **Sample:** 481586-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/21/14 22:24

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.8	105	70-135	
o-Terphenyl	62.7	49.9	126	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef Gathering System

Work Orders : 481523, **Project ID:** 074638

Lab Batch #: 936861 **Sample:** 481523-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/22/14 16:59

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0341	0.0300	114	80-120	

Lab Batch #: 936919 **Sample:** 481704-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/24/14 13:26

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: ABO Reef Gathering System

Work Order #: 481523 **Project ID:** 074638

Analyst: ARM **Date Prepared:** 03/22/2014 **Date Analyzed:** 03/22/2014

Lab Batch ID: 936861 **Sample:** 652876-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.106	106	0.100	0.108	108	2	70-130	35	
Toluene	<0.00200	0.100	0.106	106	0.100	0.107	107	1	70-130	35	
Ethylbenzene	<0.00100	0.100	0.112	112	0.100	0.113	113	1	71-129	35	
m_p-Xylenes	<0.00200	0.200	0.230	115	0.200	0.234	117	2	70-135	35	
o-Xylene	<0.00100	0.100	0.115	115	0.100	0.117	117	2	71-133	35	

Analyst: ARM **Date Prepared:** 03/24/2014 **Date Analyzed:** 03/24/2014

Lab Batch ID: 936919 **Sample:** 652884-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00100	0.100	0.105	105	0.100	0.107	107	2	70-130	35	
Toluene	<0.00200	0.100	0.105	105	0.100	0.107	107	2	70-130	35	
Ethylbenzene	<0.00100	0.100	0.112	112	0.100	0.113	113	1	71-129	35	
m_p-Xylenes	<0.00200	0.200	0.231	116	0.200	0.234	117	1	70-135	35	
o-Xylene	<0.00100	0.100	0.115	115	0.100	0.117	117	2	71-133	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: ABO Reef Gathering System

Work Order #: 481523 **Project ID:** 074638

Analyst: AMB **Date Prepared:** 03/25/2014 **Date Analyzed:** 03/26/2014

Lab Batch ID: 937259 **Sample:** 652941-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<2.00	50.0	51.4	103	50.0	51.0	102	1	80-120	20	

Analyst: AMB **Date Prepared:** 03/26/2014 **Date Analyzed:** 03/26/2014

Lab Batch ID: 937197 **Sample:** 652943-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<2.00	50.0	52.0	104	50.0	54.0	108	4	80-120	20	

Analyst: ARM **Date Prepared:** 03/20/2014 **Date Analyzed:** 03/20/2014

Lab Batch ID: 936718 **Sample:** 652765-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<15.0	1000	804	80	1000	808	81	0	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.0	1000	811	81	1000	802	80	1	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: ABO Reef Gathering System

Work Order #: 481523 **Project ID:** 074638

Analyst: ARM **Date Prepared:** 03/21/2014 **Date Analyzed:** 03/21/2014

Lab Batch ID: 936868 **Sample:** 652882-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<15.0	1000	907	91	1000	846	85	7	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.0	1000	990	99	1000	834	83	17	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: ABO Reef Gathering System

Work Order #: 481523

Lab Batch #: 937197 **Project ID:** 074638

Date Analyzed: 03/26/2014 **Date Prepared:** 03/26/2014 **Analyst:** AMB

QC- Sample ID: 481523-021 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	284	260	619	129	80-120	X

Lab Batch #: 937197

Date Analyzed: 03/27/2014 **Date Prepared:** 03/26/2014 **Analyst:** AMB

QC- Sample ID: 481937-001 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	1210	1070	2510	121	80-120	X

Lab Batch #: 937259

Date Analyzed: 03/26/2014 **Date Prepared:** 03/25/2014 **Analyst:** AMB

QC- Sample ID: 481523-001 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	18.1	170	186	99	80-120	

Lab Batch #: 937259

Date Analyzed: 03/26/2014 **Date Prepared:** 03/25/2014 **Analyst:** AMB

QC- Sample ID: 481523-011 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX / MATRIX SPIKE RECOVERY STUDY					
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	7.20	78.0	86.0	101	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: ABO Reef Gathering System

Work Order # : 481523 **Project ID:** 074638

Lab Batch ID: 936861 **QC- Sample ID:** 481523-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/22/2014 **Date Prepared:** 03/22/2014 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00169	0.169	0.149	88	0.169	0.157	93	5	70-130	35	
Toluene	<0.00339	0.169	0.140	83	0.169	0.148	88	6	70-130	35	
Ethylbenzene	<0.00169	0.169	0.136	80	0.169	0.145	86	6	71-129	35	
m_p-Xylenes	<0.00339	0.339	0.281	83	0.337	0.296	88	5	70-135	35	
o-Xylene	<0.00169	0.169	0.140	83	0.169	0.148	88	6	71-133	35	

Lab Batch ID: 936919 **QC- Sample ID:** 481704-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/24/2014 **Date Prepared:** 03/24/2014 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00547	0.547	0.518	95	0.547	0.536	98	3	70-130	35	
Toluene	<0.0109	0.547	0.530	97	0.547	0.556	102	5	70-130	35	
Ethylbenzene	<0.00547	0.547	0.555	101	0.547	0.575	105	4	71-129	35	
m_p-Xylenes	<0.0109	1.09	1.14	105	1.09	1.19	109	4	70-135	35	
o-Xylene	<0.00547	0.547	0.567	104	0.547	0.594	109	5	71-133	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: ABO Reef Gathering System

Work Order # : 481523 **Project ID:** 074638

Lab Batch ID: 936718 **QC- Sample ID:** 481523-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/20/2014 **Date Prepared:** 03/20/2014 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<15.7	1050	865	82	1050	1020	97	16	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.7	1050	883	84	1050	1100	105	22	70-135	35	

Lab Batch ID: 936868 **QC- Sample ID:** 481586-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/21/2014 **Date Prepared:** 03/21/2014 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<15.4	1030	934	91	1030	988	96	6	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.4	1030	1000	97	1030	1030	100	3	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Sample Duplicate Recovery

Project Name: ABO Reef Gathering System

Work Order #: 481523

Lab Batch #: 936913 **Project ID:** 074638
Date Analyzed: 03/24/2014 13:05 **Date Prepared:** 03/24/2014 **Analyst:** WRU
QC- Sample ID: 481522-026 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	3.34	3.63	8	20	

Lab Batch #: 936913
Date Analyzed: 03/24/2014 13:05 **Date Prepared:** 03/24/2014 **Analyst:** WRU
QC- Sample ID: 481523-010 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	21.0	23.9	13	20	

Lab Batch #: 936927
Date Analyzed: 03/24/2014 17:20 **Date Prepared:** 03/24/2014 **Analyst:** WRU
QC- Sample ID: 481523-020 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	7.51	7.52	0	20	

Lab Batch #: 936927
Date Analyzed: 03/24/2014 17:20 **Date Prepared:** 03/24/2014 **Analyst:** WRU
QC- Sample ID: 481652-004 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	4.42	4.14	7	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.
BRL - Below Reporting Limit

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Lakeland, Florida (863-646-8526)
Tampa, Florida (813-620-2000)
www.xenco.com

Xenco Quote #
Xenco Job # 481523

Client / Reporting Information

Company Name / Branch: CRA
Company Address: 2135 S. Loop 250 W, Midland, TX 79703
Email: jfergerson@craworld.com
Phone No: (432) 686-0086
Project Contact: Chris Knight / Jake Ferenz
Samplers's Name: John Fergerson

Project Information

Project Name/Number: ABO Reef Gathering System/074638
Project Location: Lea County, NM
Invoice To:
PO Number:

Analytical Information

Matrix Codes

A= Air
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
WW= Waste Water
W = Wipe
O = Oil

WW= Waste Water

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	BTEX	TPH (GRO+DRO)	Chlorides	Field Comments
1	074638-JMF-SB1	0'	3/17/14	1125	S	1								✓	✓	✓	✓	
2	074638-JMF-SB1	15'	3/17/14	1134	S	1								✓	✓	✓	✓	
3	074638-JMF-SB1	30'	3/17/14	1144	S	1								✓			✓	
4	074638-JMF-SB1	50'	3/17/14	1206	S	1								✓			✓	
5	074638-JMF-SB2	0'	3/17/14	1300	S	1								✓	✓	✓	✓	
6	074638-JMF-SB2	15'	3/17/14	1312	S	1								✓	✓	✓	✓	
7	074638-JMF-SB2	30'	3/17/14	1314	S	1								✓			✓	
8	074638-JMF-SB2	50'	3/17/14	1329	S	1								✓			✓	
9	074638-JMF-SB3	0'	3/17/14	1408	S	1								✓	✓	✓	✓	
10	074638-JMF-SB3	15'	3/17/14	1413	S	1								✓	✓	✓	✓	

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☑ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/19/14 1225	1	2	3/19/14 12:25	
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☐ Cooler Temp. 1.5 Thermo. Corr. Factor

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Norcross, Georgia (770-449-8800)

Lakeland, Florida (863-646-8526)

Tampa, Florida (813-620-2000)

Xenco Quote #

Xenco Job # 481523

Client / Reporting Information

Company Name / Branch: CRA

Company Address: 2135 S. Loop 250 W, Midland, TX 79703

Email: jfergerson@craworld.com Phone No: (432) 686-0086

Project Contact: Chris Knight/Jake Ferenz

Samplers's Name: John Fergerson

Project Information

Project Name/Number: ABO Reef Gathering System/074638

Project Location: Lea County, NM

Invoice To:

PO Number:

Analytical Information

Matrix Codes

A= Air
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
WW= Waste Water
W = Wipe
O = Oil

WW= Waste Water

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	BTEX	TPH GRO + DRO	Chlorides	Field Comments
1	074638-JMF-SB3	30'	3/17/14	1417	S	1								✓			✓	
2	074638-JMF-SB3	50'	3/17/14	1433	S	1								✓			✓	
3	074638-JMF-SB4	0'	3/17/14	1506	S	1								✓	✓	✓	✓	
4	074638-JMF-SB4	15'	3/17/14	1512	S	1								✓	✓	✓	✓	
5	074638-JMF-SB4	30'	3/17/14	1514	S	1								✓			✓	
6	074638-JMF-SB4	50'	3/17/14	1535	S	1								✓			✓	
7	074638-JMF-SS1	3.5'	3/17/14	1558	S	1								✓	✓	✓	✓	
8	074638-JMF-SS2	3.5'	3/17/14	1600	S	1								✓	✓	✓	✓	
9	074638-JMF-SS3	3.5'	3/17/14	1602	S	1								✓	✓	✓	✓	
10	074638-JMF-SS4	3.5'	3/17/14	1604	S	1								✓	✓	✓	✓	

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- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☑ 7 Day TAT
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- ☐ 3 Day EMERGENCY

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- ☐ TRRP Checklist

Notes:

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	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	John Fergerson	3/19/14 1225		2	3/19/14 12:25	2
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
			3	4		4
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
			5		☐	☐ 1.5

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WW= Waste Water

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	BTEX	TPH (GRO+ DRO)	Chlorides	Field Comments
1	074638-JMF-SW1	2.5'	3/17/14	1608	S	1								✓	✓	✓	✓	
2	074638-JMF-SW2	2.5'	3/17/14	1611	S	1								✓	✓	✓	✓	
3	074638-JMF-SW3	2.5'	3/17/14	1614	S	1								✓	✓	✓	✓	
4	074638-JMF-SW4	2.5'	3/17/14	1616	S	1								✓	✓	✓	✓	
5																		
6																		
7																		
8																		
9																		
10																		

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☑ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		3/19/14 1225	1	2	3/19/14 12:25	3
3	Relinquished By:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☐

Cooler Temp. 1.5 Thermo. Corr. Factor

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to XENCO Laboratories and its affiliates, subcontractors and assigns XENCO's standard terms and conditions of service unless previously negotiated under a fully executed client contract.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Conestoga Rovers & Associates

Date/ Time Received: 03/19/2014 12:25:00 PM

Work Order #: 481523

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**N/A**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**N/A**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**N/A**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:	PH Device/Lot#:

Checklist completed by: Ruriko Konuma Date: 03/19/2014

Checklist reviewed by: Kelsey Brooks Date: 03/19/2014

Analytical Report 514048

for

GHD Services, INC- Midland

Project Manager: Jacob Ferenz

ABO Reef

074638

01-SEP-15

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-15-19), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Texas (T104704477), Louisiana (04176), USDA (P330-07-00105)

Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

01-SEP-15

Project Manager: **Jacob Ferenz**
GHD Services, INC- Midland
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **514048**
ABO Reef
Project Address:

Jacob Ferenz:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 514048. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 514048 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 514048

GHD Services, INC- Midland, Midland, TX

ABO Reef

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SS-081915-JF-SB1 0'	S	08-19-15 10:00	- 0 ft	514048-001
SS-081915-JF-SB1 5'	S	08-19-15 10:05	- 5 ft	514048-002
SS-081915-JF-SB1 10'	S	08-19-15 10:10	- 10 ft	514048-003
SS-081915-JF-SB1 15'	S	08-19-15 10:20	- 15 ft	514048-004
SS-081915-JF-SB1 20'	S	08-19-15 10:25	- 20 ft	514048-005
SS-081915-JF-SB1 30'	S	08-19-15 10:30	- 30 ft	514048-006
SS-081915-JF-SB1 40'	S	08-19-15 10:35	- 40 ft	514048-007
SS-081915-JF-SB1 50'	S	08-19-15 10:40	- 50 ft	514048-008
SS-081915-JF-SB2 0'	S	08-19-15 10:45	- 0 ft	514048-009
SS-081915-JF-SB2 5'	S	08-19-15 10:50	- 5 ft	514048-010
SS-081915-JF-SB2 10'	S	08-19-15 10:55	- 10 ft	514048-011
SS-081915-JF-SB2 15'	S	08-19-15 11:00	- 15 ft	514048-012
SS-081915-JF-SB2 20'	S	08-19-15 11:05	- 20 ft	514048-013
SS-081915-JF-SB2 30'	S	08-19-15 11:10	- 30 ft	514048-014
SS-081915-JF-SB2 40'	S	08-19-15 11:15	- 40 ft	514048-015
SS-081915-JF-SB2 50'	S	08-19-15 11:20	- 50 ft	514048-016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 514048

GHD Services, INC- Midland, Midland, TX

Project Name: ABO Reef

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Fri Aug-21-15 04:15 pm
Report Date: 01-SEP-15
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	514048-001		514048-002		514048-003		514048-004		514048-005		514048-006	
	Field Id:	SS-081915-JF-SB1 0'		SS-081915-JF-SB1 5'		SS-081915-JF-SB1 10'		SS-081915-JF-SB1 15'		SS-081915-JF-SB1 20'		SS-081915-JF-SB1 30'	
	Depth:	0 ft		5 ft		10 ft		15 ft		20 ft		30 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-19-15 10:00		Aug-19-15 10:05		Aug-19-15 10:10		Aug-19-15 10:20		Aug-19-15 10:25		Aug-19-15 10:30	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Aug-28-15 16:00		Aug-28-15 16:00		Aug-28-15 16:00		Aug-28-15 16:00		Aug-28-15 16:00		Aug-28-15 16:00	
	Analyzed:	Aug-29-15 20:16		Aug-29-15 20:39		Aug-29-15 21:01		Aug-29-15 21:24		Aug-29-15 22:32		Aug-29-15 22:55	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		60.9	11.6	8.81	2.42	5.31	2.56	6.05	2.24	9.07	3.61	5.55	3.17
Percent Moisture	***Extracted:***												
	Analyzed:	Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		14.0	1.00	17.3	1.00	21.7	1.00	10.6	1.00	44.6	1.00	37.0	1.00
TPH By SW8015B Mod	***Extracted:***	Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00	
	Analyzed:	Aug-31-15 19:28		Aug-31-15 21:09		Aug-31-15 21:57		Aug-31-15 22:34		Aug-31-15 23:10		Aug-30-15 00:19	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C10 Gasoline Range Hydrocarbons		ND	17.4	ND	18.1	ND	19.2	ND	16.8	ND	27.1	ND	23.8
C10-C28 Diesel Range Hydrocarbons		85.4	17.4	ND	18.1	ND	19.2	ND	16.8	ND	27.1	ND	23.8
Total TPH		85.4	17.4	ND	18.1	ND	19.2	ND	16.8	ND	27.1	ND	23.8

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 514048

GHD Services, INC- Midland, Midland, TX

Project Name: ABO Reef

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Fri Aug-21-15 04:15 pm
Report Date: 01-SEP-15
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	514048-007		514048-008		514048-009		514048-010		514048-011		514048-012	
	Field Id:	SS-081915-JF-SB1 40'		SS-081915-JF-SB1 50'		SS-081915-JF-SB2 0'		SS-081915-JF-SB2 5'		SS-081915-JF-SB2 10'		SS-081915-JF-SB2 15'	
	Depth:	40 ft		50 ft		0 ft		5 ft		10 ft		15 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-19-15 10:35		Aug-19-15 10:40		Aug-19-15 10:45		Aug-19-15 10:50		Aug-19-15 10:55		Aug-19-15 11:00	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Aug-28-15 16:00		Aug-28-15 16:00		Aug-28-15 16:00		Aug-29-15 11:30		Aug-29-15 11:30		Aug-29-15 11:30	
	Analyzed:	Aug-29-15 23:17		Aug-29-15 23:40		Aug-30-15 00:03		Aug-30-15 02:19		Aug-30-15 03:05		Aug-30-15 03:27	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		18.0	2.23	20.4	2.19	24.7	2.93	20.4	2.04	15.9	2.10	16.7	2.73
Percent Moisture	***Extracted:***												
	Analyzed:	Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30		Aug-27-15 17:30		Aug-28-15 17:30		Aug-28-15 17:30	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		10.5	1.00	8.75	1.00	31.8	1.00	2.13	1.00	4.67	1.00	26.8	1.00
TPH By SW8015B Mod	***Extracted:***	Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00	
	Analyzed:	Aug-30-15 14:08		Aug-30-15 19:01		Aug-30-15 19:32		Aug-30-15 20:03		Aug-30-15 20:35		Aug-30-15 22:08	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C10 Gasoline Range Hydrocarbons		18.4	16.8	ND	16.4	ND	22.0	ND	15.3	ND	15.7	ND	20.5
C10-C28 Diesel Range Hydrocarbons		ND	16.8	ND	16.4	ND	22.0	ND	15.3	ND	15.7	ND	20.5
Total TPH		18.4	16.8	ND	16.4	ND	22.0	ND	15.3	ND	15.7	ND	20.5

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 514048

GHD Services, INC- Midland, Midland, TX

Project Name: ABO Reef

Project Id: 074638
Contact: Jacob Ferenz
Project Location:

Date Received in Lab: Fri Aug-21-15 04:15 pm
Report Date: 01-SEP-15
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	514048-013		514048-014		514048-015		514048-016					
	Field Id:	SS-081915-JF-SB2 20'		SS-081915-JF-SB2 30'		SS-081915-JF-SB2 40'		SS-081915-JF-SB2 50'					
	Depth:	20 ft		30 ft		40 ft		50 ft					
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Aug-19-15 11:05		Aug-19-15 11:10		Aug-19-15 11:15		Aug-19-15 11:20					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Aug-29-15 11:30		Aug-29-15 11:30		Aug-29-15 11:30		Aug-29-15 11:30					
	Analyzed:	Aug-30-15 03:50		Aug-30-15 04:13		Aug-30-15 04:35		Aug-30-15 05:44					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		27.4	2.28	6.87	2.20	7.89	2.24	10.6	2.24				
Percent Moisture	***Extracted:***												
	Analyzed:	Aug-28-15 17:30		Aug-28-15 17:30		Aug-28-15 17:30		Aug-28-15 17:30					
	Units/RL:	%	RL	%	RL	%	RL	%	RL				
Percent Moisture		12.1	1.00	9.24	1.00	10.9	1.00	10.6	1.00				
TPH By SW8015B Mod	***Extracted:***	Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00		Aug-29-15 18:00					
	Analyzed:	Aug-30-15 22:39		Aug-31-15 20:17		Aug-31-15 12:22		Aug-31-15 12:53					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
C6-C10 Gasoline Range Hydrocarbons		ND	17.1	ND	16.5	ND	16.8	ND	16.8				
C10-C28 Diesel Range Hydrocarbons		ND	17.1	ND	16.5	ND	16.8	ND	16.8				
Total TPH		ND	17.1	ND	16.5	ND	16.8	ND	16.8				

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: ABO Reef

Work Orders : 514048,

Project ID: 074638

Lab Batch #: 975961 **Sample:** 514048-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 00:19

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.3	100	94	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

Lab Batch #: 975961 **Sample:** 514048-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 14:08

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	100	107	70-135	
o-Terphenyl	53.5	50.0	107	70-135	

Lab Batch #: 975961 **Sample:** 514048-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 19:01

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.0	100	90	70-135	
o-Terphenyl	45.5	50.0	91	70-135	

Lab Batch #: 975961 **Sample:** 514048-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 19:32

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.6	100	90	70-135	
o-Terphenyl	45.3	50.0	91	70-135	

Lab Batch #: 975961 **Sample:** 514048-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 20:03

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	55.7	50.0	111	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef

Work Orders : 514048,

Project ID: 074638

Lab Batch #: 975961 **Sample:** 514048-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 20:35

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.0	100	88	70-135	
o-Terphenyl	44.6	50.0	89	70-135	

Lab Batch #: 975961 **Sample:** 514048-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 22:08

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	51.3	50.0	103	70-135	

Lab Batch #: 975961 **Sample:** 514048-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/30/15 22:39

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.5	100	90	70-135	
o-Terphenyl	44.8	50.0	90	70-135	

Lab Batch #: 975961 **Sample:** 514048-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 12:22

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.4	100	91	70-135	
o-Terphenyl	45.7	50.0	91	70-135	

Lab Batch #: 975961 **Sample:** 514048-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 12:53

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.7	100	95	70-135	
o-Terphenyl	47.4	50.0	95	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef

Work Orders : 514048,

Project ID: 074638

Lab Batch #: 975961 **Sample:** 514048-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 19:28

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.0	100	97	70-135	
o-Terphenyl	46.0	50.0	92	70-135	

Lab Batch #: 975961 **Sample:** 514048-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 20:17

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.1	100	93	70-135	
o-Terphenyl	46.2	50.0	92	70-135	

Lab Batch #: 975961 **Sample:** 514048-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 21:09

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	100	103	70-135	
o-Terphenyl	50.7	50.0	101	70-135	

Lab Batch #: 975961 **Sample:** 514048-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 21:57

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	55.1	50.0	110	70-135	

Lab Batch #: 975961 **Sample:** 514048-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 22:34

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	50.2	50.0	100	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef

Work Orders : 514048,

Project ID: 074638

Lab Batch #: 975961 **Sample:** 514048-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 23:10

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.4	100	98	70-135	
o-Terphenyl	48.9	50.0	98	70-135	

Lab Batch #: 975961 **Sample:** 697535-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 08/29/15 18:59

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	117	100	117	70-135	
o-Terphenyl	59.6	50.0	119	70-135	

Lab Batch #: 975961 **Sample:** 697535-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 08/29/15 19:45

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	100	101	70-135	
o-Terphenyl	46.3	50.0	93	70-135	

Lab Batch #: 975961 **Sample:** 697535-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 08/29/15 20:34

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	100	106	70-135	
o-Terphenyl	47.3	50.0	95	70-135	

Lab Batch #: 975961 **Sample:** 514048-008 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 16:08

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	100	115	70-135	
o-Terphenyl	50.9	50.0	102	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: ABO Reef

Work Orders : 514048, **Project ID:** 074638

Lab Batch #: 975961 **Sample:** 514048-008 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 08/31/15 16:42

SURROGATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	100	115	70-135	
o-Terphenyl	52.0	50.0	104	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: ABO Reef

Work Order #: 514048 **Project ID:** 074638

Analyst: JUM **Date Prepared:** 08/28/2015 **Date Analyzed:** 08/29/2015

Lab Batch ID: 975766 **Sample:** 697370-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<2.00	50.0	50.6	101	50.0	50.3	101	1	90-110	20	

Analyst: JUM **Date Prepared:** 08/29/2015 **Date Analyzed:** 08/30/2015

Lab Batch ID: 975769 **Sample:** 697375-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<2.00	50.0	49.6	99	50.0	50.0	100	1	90-110	20	

Analyst: PJB **Date Prepared:** 08/29/2015 **Date Analyzed:** 08/29/2015

Lab Batch ID: 975961 **Sample:** 697535-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	835	84	1000	878	88	5	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	747	75	1000	778	78	4	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: ABO Reef

Work Order #: 514048

Lab Batch #: 975766 **Project ID:** 074638

Date Analyzed: 08/29/2015 **Date Prepared:** 08/28/2015 **Analyst:** JUM

QC- Sample ID: 514047-027 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Chloride	3.63	51.8	57.6	104	80-120	

Lab Batch #: 975766

Date Analyzed: 08/29/2015 **Date Prepared:** 08/28/2015 **Analyst:** JUM

QC- Sample ID: 514468-003 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Chloride	1720	2500	4350	105	80-120	

Lab Batch #: 975769

Date Analyzed: 08/30/2015 **Date Prepared:** 08/29/2015 **Analyst:** JUM

QC- Sample ID: 514048-010 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Chloride	20.4	51.1	70.6	98	80-120	

Lab Batch #: 975769

Date Analyzed: 08/30/2015 **Date Prepared:** 08/29/2015 **Analyst:** JUM

QC- Sample ID: 514049-004 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Chloride	599	1150	1840	108	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: ABO Reef

Work Order # : 514048 **Project ID:** 074638

Lab Batch ID: 975961 **QC- Sample ID:** 514048-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 08/31/2015 **Date Prepared:** 08/29/2015 **Analyst:** PJB

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015B Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<16.4	1100	964	88	1100	1030	94	7	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<16.4	1100	990	90	1100	1000	91	1	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Sample Duplicate Recovery

Project Name: ABO Reef

Work Order #: 514048

Lab Batch #: 975638 **Project ID:** 074638
Date Analyzed: 08/27/2015 17:30 **Date Prepared:** 08/27/2015 **Analyst:** WRU
QC- Sample ID: 514047-011 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	16.8	16.9	1	20	

Lab Batch #: 975638
Date Analyzed: 08/27/2015 17:30 **Date Prepared:** 08/27/2015 **Analyst:** WRU
QC- Sample ID: 514047-021 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	8.95	8.49	5	20	

Lab Batch #: 975640
Date Analyzed: 08/27/2015 17:30 **Date Prepared:** 08/27/2015 **Analyst:** WRU
QC- Sample ID: 513982-001 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	1.70	1.32	25	20	F

Lab Batch #: 975640
Date Analyzed: 08/27/2015 17:30 **Date Prepared:** 08/27/2015 **Analyst:** WRU
QC- Sample ID: 514225-006 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	5.33	5.10	4	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.
BRL - Below Reporting Limit

Sample Duplicate Recovery

Project Name: ABO Reef

Work Order #: 514048

Lab Batch #: 975822 **Project ID:** 074638

Date Analyzed: 08/28/2015 17:30 **Date Prepared:** 08/28/2015 **Analyst:** WRU

QC- Sample ID: 513914-002 D **Batch #:** 1 **Matrix:** Soil

Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	9.85	9.89	0	20	

Lab Batch #: 975822

Date Analyzed: 08/28/2015 17:30 **Date Prepared:** 08/28/2015 **Analyst:** WRU

QC- Sample ID: 514048-011 D **Batch #:** 1 **Matrix:** Soil

Reporting Units: %

Percent Moisture Analyte	SAMPLE / SAMPLE DUPLICATE RECOVERY Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	4.67	4.27	9	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

CHAIN OF CUSTODY

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Norcross, Georgia (770-449-8800)
Lakeland, Florida (863-646-8526)
Tampa, Florida (813-620-2000)
www.xenco.com

Xenco Quote # | Xenco Job # 514048

Client / Reporting Information

Company Name / Branch: GHD Services, Inc - Dallas
Company Address: 1755 Wittington Place, Suite 500 Dallas, TX 75234
Email: Christopher.Knight@GHD.com; Jake.Ferenz@GHD.com
Phone No:
Project Contact: Jake Ferenz
Samplers's Name: John Fergerson

Project Information

Project Name/Number: CEMC1074638
Project Location: Abo Reef
Invoice To:
PO Number:

Analytical Information

TPH (GRO-DRO)
Chlorides

Matrix Codes

A= Air
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
WW= Waste Water
W = Wipe
O = Oil

WW= Waste Water

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Field Comments
1	SS-081915-JF-SB-1	0'	8/19/15	1000	S	1								X	
2	SS-081915-JF-SB-1	5'	8/19/15	1005	S	1								X	
3	SS-081915-JF-SB-1	10'	8/19/15	1010	S	1								X	
4	SS-081915-JF-SB-1	15'	8/19/15	1020	S	1								X	
5	SS-081915-JF-SB-1	20'	8/19/15	1025	S	1								X	
6	SS-081915-JF-SB-1	30'	8/19/15	1030	S	1								X	
7	SS-081915-JF-SB-1	40'	8/19/15	1035	S	1								X	
8	SS-081915-JF-SB-1	50'	8/19/15	1040	S	1								X	
9	SS-081915-JF-SB-2	0'	8/19/15	1045	S	1								X	
10	SS-081915-JF-SB-2	5'	8/19/15	1050	S	1								X	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes: See SOW

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Jennifer Reed	8/21/15 1615	1	2	8/21/15 16:15	2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice: X; Cooler Temp.: 3.4°; Thermo. Corr. Factor

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to XENCO Laboratories and its affiliates, subcontractors and assigns XENCO's standard terms and conditions of service unless previously negotiated under a fully executed client contract.

CHAIN OF CUSTODY

Page 2 Of 2

XENCO LABORATORIES

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Odessa, Texas (432-563-1800)

Norcross, Georgia (770-449-8800)

Lakeland, Florida (863-646-8526)

Tampa, Florida (813-620-2000)

Xenco Quote #

Xenco Job # 514048

Client / Reporting Information

Company Name / Branch: GHD Services, Inc - Dallas

Company Address: 1755 Wittington Place, Suite 500 Dallas, TX 75234

Email: Christopher.knight@GHD.com; Jake.Ferenz@GHD.com

Phone No:

Project Contact: Jake Ferenz

Samplers's Name: John Fergerson

Project Information

Project Name/Number: CENCL 074638

Project Location: Abo Reef

Invoice To:

PO Number:

Analytical Information

Matrix Codes

A= Air
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
WW= Waste Water
W = Wipe
O = Oil

WW= Waste Water

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH (GRO+DRO)	Chlorides	Field Comments
1	SS-081915-JF-SB-2	10'	8/19/15	1055	S	1								X	✓	✓	
2	SS-081915-JF-SB-2	15'	8/19/15	1100	S	1								X	✓	✓	
3	SS-081915-JF-SB-2	20'	8/19/15	1105	S	1								X	✓	✓	
4	SS-081915-JF-SB-2	30'	8/19/15	1110	S	1								X	✓	✓	
5	SS-081915-JF-SB-2	40'	8/19/15	1115	S	1								X	✓	✓	
6	SS-081915-JF-SB-2	50'	8/19/15	1120	S	1								X	✓	✓	
7																	
8																	
9																	
10																	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes: See SSOW

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler: Jennifer Reed	Date Time: 8/21/1615	Received By: 1	Relinquished By: 2	Date Time: 8/21/15 1615	Received By: 2
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice: X; Cooler Temp. 3.4°; Thermo. Corr. Factor

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to XENCO Laboratories and its affiliates, subcontractors and assigns XENCO's standard terms and conditions of service unless previously negotiated under a fully executed client contract.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 08/21/2015 04:15:00 PM

Work Order #: 514048

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.4
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**N/A**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 08/23/2015

Checklist reviewed by: Kelsey Brooks Date: 08/25/2015

Analytical Report 535677

for

GHD Services, INC- Midland

Project Manager: Chris Knight

Abo Reef Gathering System

074638

31-AUG-16

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

Table of Contents

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Project Manager: **Chris Knight**
GHD Services, INC- Midland
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **535677**
Abo Reef Gathering System
Project Address: Lovington, NM

Chris Knight:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 535677. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 535677 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 535677

GHD Services, INC- Midland, Midland, TX

Abo Reef Gathering System

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-3-082216-5'	S	08-22-16 11:30	- 5 ft	535677-001
SB-3-082216-10'	S	08-22-16 11:35	- 10 ft	535677-002
SB-3-082216-15'	S	08-22-16 11:40	- 20 ft	535677-003
SB-3-082216-50'	S	08-22-16 11:45	- 50 ft	535677-004

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 535677

GHD Services, INC- Midland, Midland, TX

Project Name: Abo Reef Gathering System

Project Id: 074638
Contact: Chris Knight
Project Location: Lovington, NM

Date Received in Lab: Thu Aug-25-16 11:20 am
Report Date: 31-AUG-16
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	535677-001		535677-002		535677-003		535677-004					
	Field Id:	SB-3-082216-5'		SB-3-082216-10'		SB-3-082216-15'		SB-3-082216-50'					
	Depth:	5 ft		10 ft		20 ft		50 ft					
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Aug-22-16 11:30		Aug-22-16 11:35		Aug-22-16 11:40		Aug-22-16 11:45					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Aug-25-16 17:00		Aug-25-16 17:00		Aug-25-16 17:00		Aug-25-16 17:00					
	Analyzed:	Aug-25-16 19:08		Aug-25-16 19:32		Aug-25-16 19:39		Aug-25-16 19:47					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		ND	10.0	ND	10.0	ND	10.0	ND	10.0				
Percent Moisture by SM2540G	***Extracted:***												
	Analyzed:	Aug-29-16 11:15		Aug-29-16 11:15		Aug-29-16 11:15		Aug-29-16 11:15					
	Units/RL:	%	RL	%	RL	%	RL	%	RL				
Percent Moisture		6.47		4.37		5.78		7.15					

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

	Phone	Fax
4147 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(602) 437-0330	

BS / BSD Recoveries

Project Name: Abo Reef Gathering System

Work Order #: 535677 **Project ID:** 074638

Analyst: MNR **Date Prepared:** 08/25/2016 **Date Analyzed:** 08/25/2016

Lab Batch ID: 1000716 **Sample:** 713076-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	270	108	250	263	105	3	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: Abo Reef Gathering System

Work Order # : 535677 **Project ID:** 074638

Lab Batch ID: 1000716 **QC- Sample ID:** 535668-007 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 08/25/2016 **Date Prepared:** 08/25/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	340	250	585	98	250	588	99	1	90-110	20	

Lab Batch ID: 1000716 **QC- Sample ID:** 535677-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 08/25/2016 **Date Prepared:** 08/25/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	265	106	250	274	110	3	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Sample Duplicate Recovery

Project Name: Abo Reef Gathering System

Work Order #: 535677

Lab Batch #: 1000868 **Project ID:** 074638

Date Analyzed: 08/29/2016 11:15 **Date Prepared:** 08/29/2016 **Analyst:** WRU

QC- Sample ID: 535672-007 D **Batch #:** 1 **Matrix:** Soil

Reporting Units: %

Percent Moisture by SM2540G	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	7.53	7.28	3	20	

Lab Batch #: 1000868

Date Analyzed: 08/29/2016 11:15 **Date Prepared:** 08/29/2016 **Analyst:** WRU

QC- Sample ID: 535677-001 D **Batch #:** 1 **Matrix:** Soil

Reporting Units: %

Percent Moisture by SM2540G	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	6.47	5.73	12	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

CHAIN OF CUSTODY

Page 1 Of 1

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200) | Odessa, Texas (432-563-1800) | Lakeland, Florida (863-646-8526)

Dallas Texas (214-902-0300) | Norcross, Georgia (770-449-8800) | Tampa, Florida (813-620-2000)

Service Center - San Antonio, Texas (210-509-3334) | www.xenco.com

Xenco Quote # | Xenco Job # 535677

Client / Reporting Information

Company Name / Branch: GHD-Midland

Company Address: 2135 S Loop 250 W, Midland, TX 79703

Email: christopher.knight@ghd.com | Phone No: 512-506-8803

Project Contact: Christopher Knight

Samplers's Name

Project Information

Project Name/Number: Abo Reef Gathering System/ 074638

Project Location: Lovington, NM

Invoice To:

PO Number:

Analytical Information

Matrix Codes

S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
W = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chlorides	Percent Moisture	Field Comments
1	SB-3-082216-5'	5'	8/22	1130	S	1								X	X	X	
2	SB-3-082216-10'	10'	8/22	1135	S	↓								↓	↓	↓	
3	SB-3-082216-20'	20'	8/22	1140	S	↓								↓	↓	↓	
4	SB-3-082216-50'	50'	8/22	1145	S	↓								↓	↓	↓	
5																	
6																	
7																	
8																	
9																	
10																	

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ Next Day EMERGENCY
- ☐ 2 Day EMERGENCY
- ☐ 3 Day EMERGENCY
- ☒ 5 Day TAT
- ☐ 7 Day TAT
- ☐ Contract TAT

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level III Std QC+ Forms
- ☐ Level 3 (CLP Forms)
- ☐ TRRP Checklist
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ TRRP Level IV
- ☐ UST / RG -411

Notes:

Reference SSOW
If questions, Please contact Project Manager

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Jennifer Stoffel	8/22/16 1120		2		2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒

Temp: 11.3 IR ID:R-8
C/F:0
Corrected Temp: 11.3

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to XENCO Laboratories and its affiliates, subcontractors and assigns XENCO's standard terms and conditions of service unless previously negi

Final 1.000

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XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 08/25/2016 11:20:00 AM

Work Order #: 535677

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : r8

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	11.3	
#2 *Shipping container in good condition?	**N/A**	
#3 *Samples received on ice?	**Yes**	chilling in progress
#4 *Custody Seal present on shipping container/ cooler?	**N/A**	
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**	
#6 Custody Seals intact on sample bottles?	**N/A**	
#7 *Custody Seals Signed and dated?	**N/A**	
#8 *Chain of Custody present?	**Yes**	
#9 Sample instructions complete on Chain of Custody?	**Yes**	
#10 Any missing/extra samples?	**No**	
#11 Chain of Custody signed when relinquished/ received?	**Yes**	
#12 Chain of Custody agrees with sample label(s)?	**Yes**	
#13 Container label(s) legible and intact?	**Yes**	
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**	
#15 Samples in proper container/ bottle?	**Yes**	
#16 Samples properly preserved?	**Yes**	
#17 Sample container(s) intact?	**Yes**	
#18 Sufficient sample amount for indicated test(s)?	**Yes**	
#19 All samples received within hold time?	**Yes**	
#20 Subcontract of sample(s)?	**N/A**	
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	**N/A**	
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**	
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer
Jessica Kramer
Date: 08/25/2016

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks
Date: 08/25/2016