J. Brady Crouch
ConocoPhillips Company
Risk Management & Remediation
Program Manager

600 N. Dairy Ashford
EC3-06-W056
Houston, TX 77079
Phone: 832-486-3016

ConocoPhillips

Mr. Randolph Bayliss, P. E.
District III & IV Hydrologist
New Mexico Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

March 21, 2017

Re: NMOCD Case No. 3R-1038, 2016 Annual Groundwater Monitoring and Site Assessment Report

Dear Mr. Bayliss:

Enclosed is the 2016 Annual Groundwater Monitoring and Site Assessment Report for the Mangum No. 1 site. This report, prepared by GHD Services, Inc., contains the results of groundwater monitoring and site assessment activities in 2016.

Please let me know if you have any questions.

Sincerely,

Joseph B. Crouch

J. Brady Crouch

Enc

2016 Well Installation and Groundwater Monitoring Report

Mangum No. 1
S27, T29N, R11W
San Juan County, New Mexico
API# 30-045-07835
NMOCD# 3R-1038

ConocoPhillips Company

GHD | 6121 Indian School Rd NE Suite 200 Albuquerque NM 87110 USA

11102646| Report No 4 | March 21, 2017

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1. Introduction

This report presents the results of monitoring well installation and quarterly groundwater monitoring events conducted on behalf of ConocoPhillips Company (ConocoPhillips) by GHD Services, Inc. (GHD) at the Mangum No. 1 natural gas well site (hereafter referred to as the "Site"). The Site is located on federal land in Section 27, Township 29N, Range 11W of San Juan County, New Mexico. Geographical coordinates for the Site are 36.6965°North, 107.9840°West. The Site consists of a natural gas well and associated equipment. The Site Location Map and Site Plan are presented as Figure 1 and 2, respectively.

1.1 Site History

Site remediation was performed to address soil impacts from an historical release of produced water and condensate. An excavation with dimensions of approximately 100 feet (ft) by 40 ft, from 9 ft to 17 ft deep was was dug in February 2016. Approximately 1,400 cubic yards (cy) of impacted soils were hauled away for off-Site disposal. Groundwater was encountered in the excavation at 16 ft below ground surface (bgs). Approximately 1 foot of groundwater saturated soil was removed from beneath the water table. . The groundwater accumulation at the bottom of the excavation was evacuated using a vacuum truck. Groundwater was allowed to recharge overnight and was evacuated for three consecutive days. Approximately 275 barrels (bbls) of groundwater were removed and transported for off-Site disposal.

A sample was obtained from the groundwater accumulation at the bottom of the excavation. The groundwater sample was analyzed for VOCs, dissolved metals including arsenic, barium, cadmium, calcium, chromium, iron, manganese, magnesium, sodium, and zinc, and for general chemistry analytes including chloride, potassium, nitrate, sulfate, fluoride, total alkalinity, bicarbonate, total hardness, pH, and specific conductivity. The groundwater sample indicated analytical results exceeding the applicable New Mexico Water Quality Control Commission (NMWQCC) groundwater quality standards for benzene, xylenes, dissolved manganese, and sulfate. The excavation was backfilled with segregated field screened soils (i.e., below 100 parts per million (ppm) on photo-ionization detector) and clean, imported fill. A report summarizing the soil excavation and subsequent groundwater recovery and sampling activities was submitted under separate cover earlier in 2016.

In May 2016, four groundwater monitoring wells were installed at the Site to assess the extent of impacts. Following the installation and development of the new wells, groundwater samples were collected in June and again in September and November 2016. Details of the monitor well installations and quarterly groundwater sampling events are presented below.

2. Monitor Well Installation

Monitor wells MW-1 through MW-4 were installed May 25-27, 2016 by National EWP of Peralta, New Mexico. Monitor well locations were proposed in a workplan submitted to both the New Mexico Oil Conservation Division and the federal Bureau Land Management. GHD met on Site with

representatives from these agencies prior to beginning drilling to evaluate proposed locations and reach consensus based on lease access limitations.

2.1 Monitor Well Drilling and Installation

Prior to initiation of monitor well installation activities, permits were submitted to and approved by the New Mexico Office of the State Engineer and a utility clearance protocol was completed. Borings were pre-drilled to a depth of 5 feet below ground surface (ft bgs) using hydro-excavation.

Yellow Jacket Drilling Services of Gilbert, Arizona, installed the monitoring wells May 25-27, 2016. The boreholes were drilled using a CME-85 drill rig and Stratex drilling equipment to address subsurface gravels and cobbles observed during the Site excavation. Boring MW-1 was drilled through excavation backfill and encountered silty-sand fill material to 18 ft bgs where a soft, weathered shale was encountered. Borings MW-2 through MW-4 encountered poorly-graded sand to 8 to 10 ft bgs, below which a sandy gravel/cobble layer until the weathered shale was encountered generally at 18 to 19 ft bgs. Groundwater was encountered at approximately 15 ft bgs, though it was generally a thin layer of moist to wet soils from 15 to 19 ft bgs where the dry shale was encountered. The Boring Log and Well Completion Forms are included as Appendix A.

Two-inch diameter, schedule 40 PVC monitoring wells were installed in each boring. The wells were installed to depths of 18 to 20 ft bgs and constructed with 10 ft of 2-inch machine slot 0.02-inch PVC screen. The wells were completed with 2-inch diameter PVC blank casing above the screened intervals.

The annulus in each borehole was backfilled with a 10/20 silica sand pack from the bottom to approximately 2 feet above the well screen. A 2-foot thick seal of 3/8-inch hydrated bentonite chips was placed above the sand pack. The remainder of the borehole annulus in each borehole was filled with a high solids bentonite grout mix.

Monitor well MW-1 was completed with a traffic-rated flush mount well cover embedded in a 2-foot by 2-foot by 4-inch thick concrete pad. Monitor wells MW-2 through MW-4 surface completions consist of a locking, stick-up well vault placed within a 2-foot by 2-foot by 4-inch thick concrete pad.

Well development was performed by bailing and surging the wells until turbidity visibly cleared and field parameters of pH, temperature, and conductivity stabilized (within a 10% margin). Well development water was placed in the on-Site produced water tank.

3. Groundwater Monitoring

3.1 Groundwater Monitoring Results

Quarterly groundwater sampling events took place in June, September and November. Depth to groundwater was gauged at monitoring wells MW-1, MW-2, MW-3 and MW-4 using an oil/water interface probe prior to sampling. A summary of historical depths to water and groundwater elevations can be found in Table 1. Groundwater potentiometric surface maps detailing groundwater elevations and groundwater flow direction using data collected during the 2016

quarterly sampling events are presented as Figures 3, 4, and 5. Groundwater flow direction at the site varies seasonally from north to northwest.

Prior to sample collection, monitor wells MW-1, MW-2, MW-3 and MW-4 were purged of at least three casing volumes of water using a dedicated polyethylene bailer prior to sampling. Groundwater quality parameters including pH, temperature, oxidation reduction potential, total dissolved solids, and conductivity were collected using a calibrated YSI 556 Multi Parameter Sonde and were recorded on GHD groundwater sampling field forms. Field parameters collected during sampling are included in Table 2.

Groundwater samples were placed in laboratory prepared bottles, packed on ice and shipped under chain of custody documentation to Pace Analytical Laboratories (Pace) located in Lenexa, Kansas. Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260 (all wells) and for dissolved manganese by EPA Method 6010B, and for sulfate by EPA Method 300.0.

The benzene and dissolved manganese concentrations where above the regulatory limit across all wells and dates. The concentrations of sulfates, xylenes and ethylbenzene were sporadically above and below the regulatory limit.

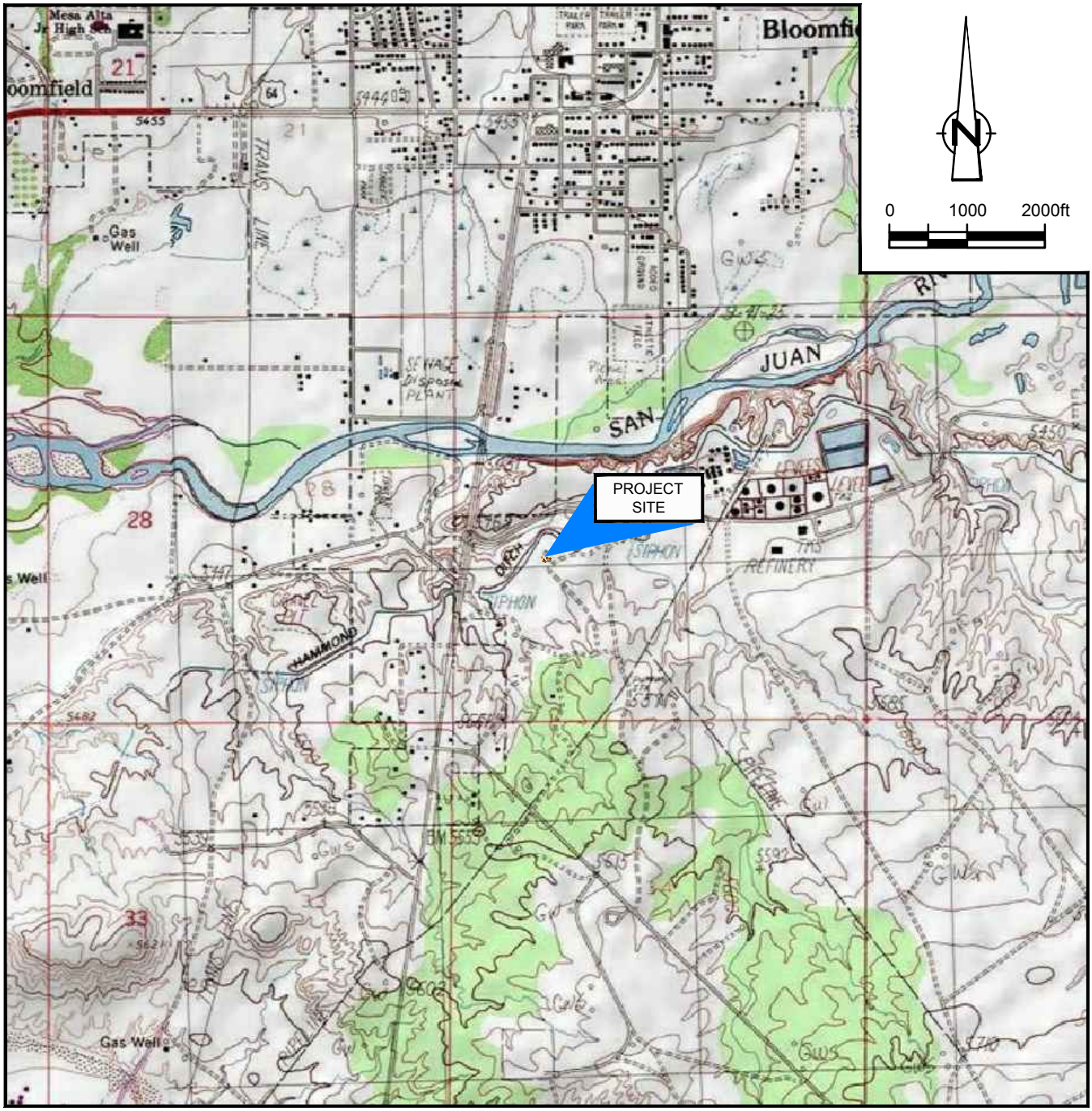
A summary of historical laboratory analytical results is presented as Table 3. Groundwater laboratory analytical reports are included as Appendix B.

4. Conclusions and Recommendations

Based on analytical results from the groundwater samples collected from Site monitor wells to date, the following observations and recommendations are made:

- Four monitor wells were installed at the Site to assess the extent of groundwater impacts.
- Samples from the monitor wells were collected during three quarterly groundwater monitoring events in 2016.
- Concentrations of BTEX constituents and dissolved manganese and sulfates occur in Site groundwater at levels above NMWQCC standards.
- Continuation of quarterly groundwater monitoring through 2017 is recommended to verify seasonal fluctuations in groundwater flow direction and gradient.

Figures



SOURCE: USGS 7.5 MINUTE QUAD
"BLOOMFIELD AND HORN CANYON, NEW MEXICO WEST"

LAT/LONG: 36.6955° NORTH, 107.9840° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ONE - NEW MEXICO WEST

Figure 1

SITE LOCATION MAP
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

GHD

11102646-00(000)GN-DL002 FEB 25/2016

Figure 2

SITE PLAN
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

GHD

11102646-00(004)GN-DL001 JAN 25, 2017

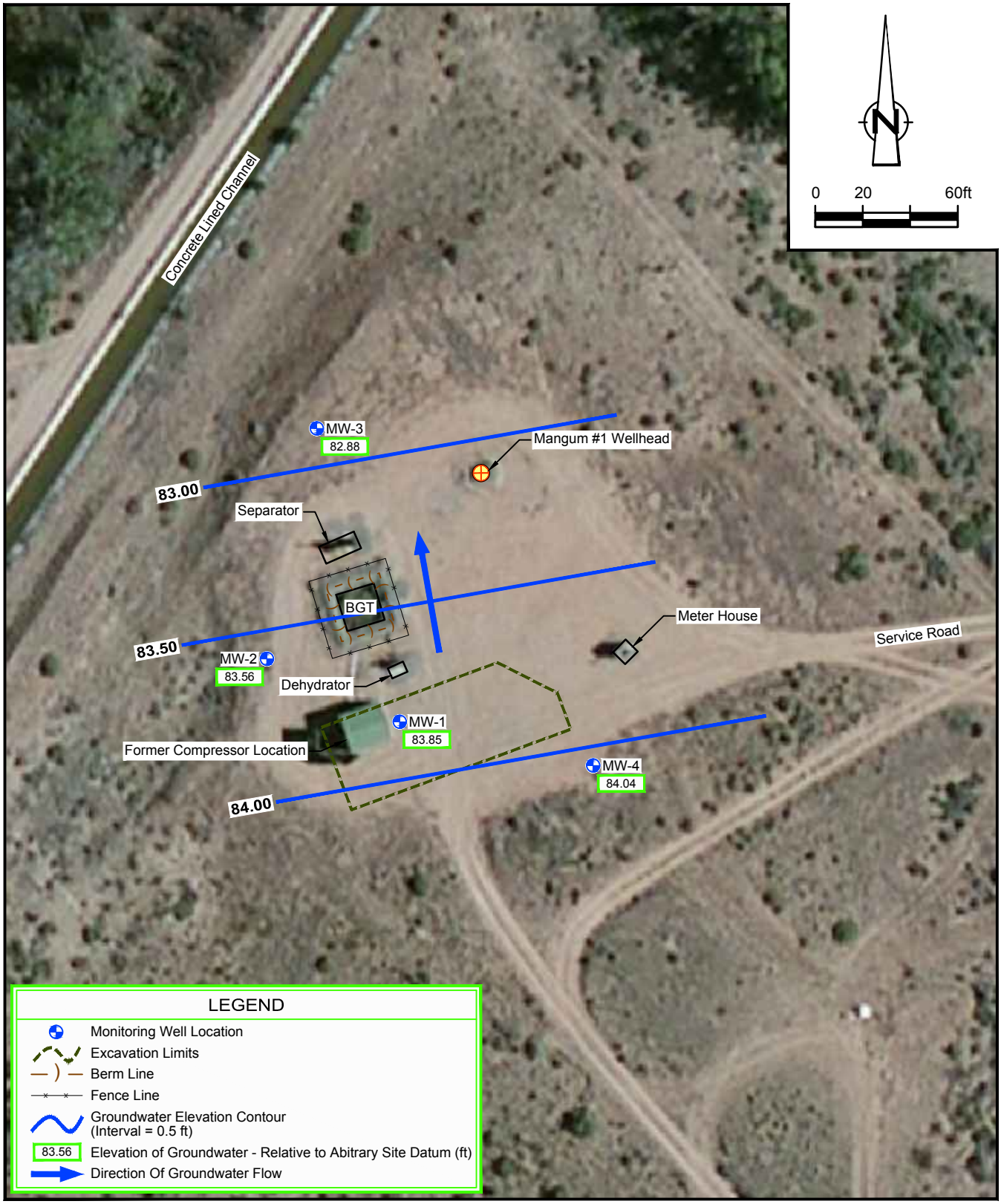


Figure 3

GROUNDWATER ELEVATION CONTOUR MAP - JUNE 2016
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

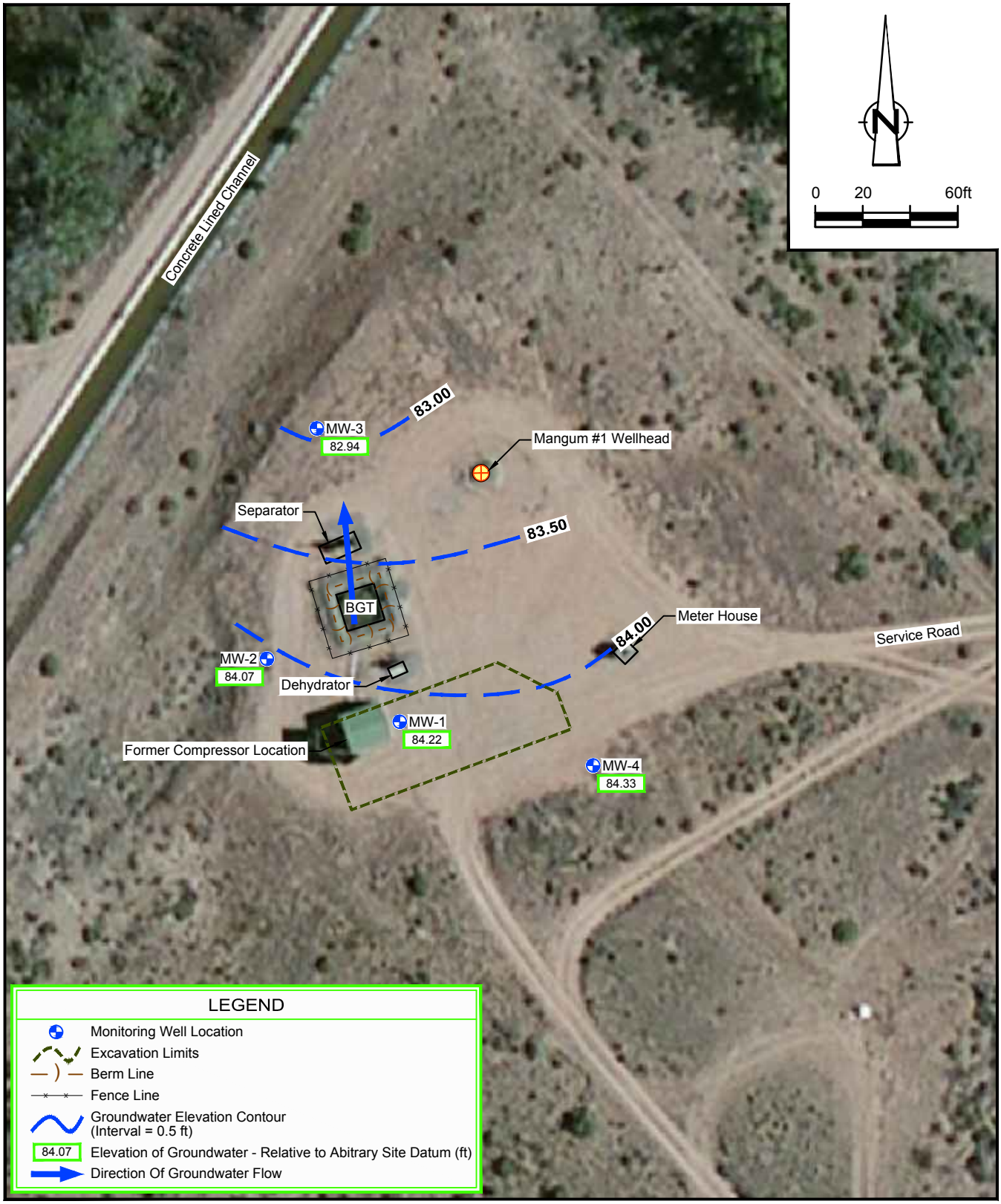


Figure 4

GROUNDWATER ELEVATION CONTOUR MAP - SEPTEMBER 2016
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

11102646-00(004)GN-DL001 JAN 25, 2017

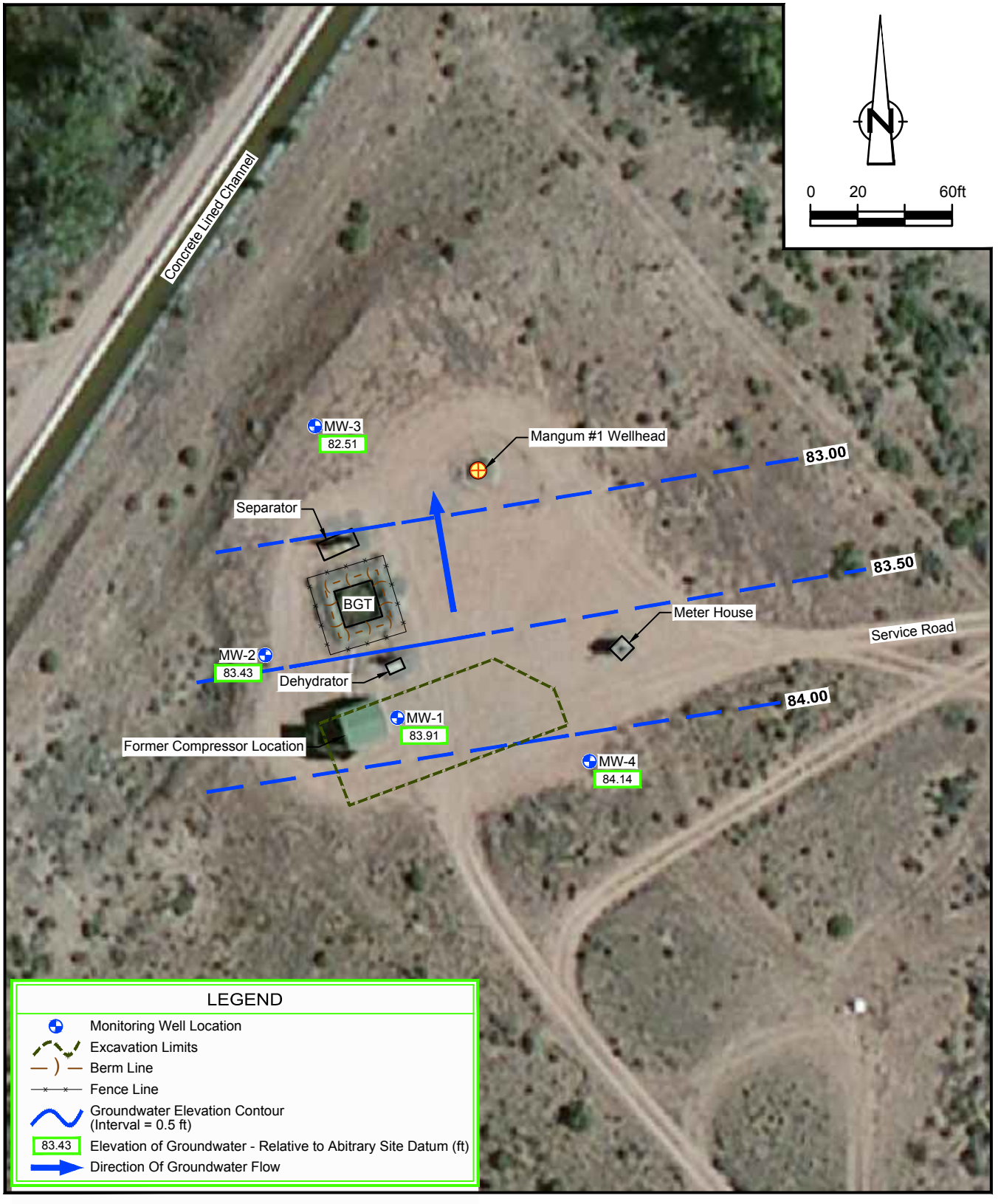


Figure 5

GROUNDWATER ELEVATION CONTOUR MAP - NOVEMBER 2016
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

11102646-00(004)GN-DL001 FEB 8, 2017

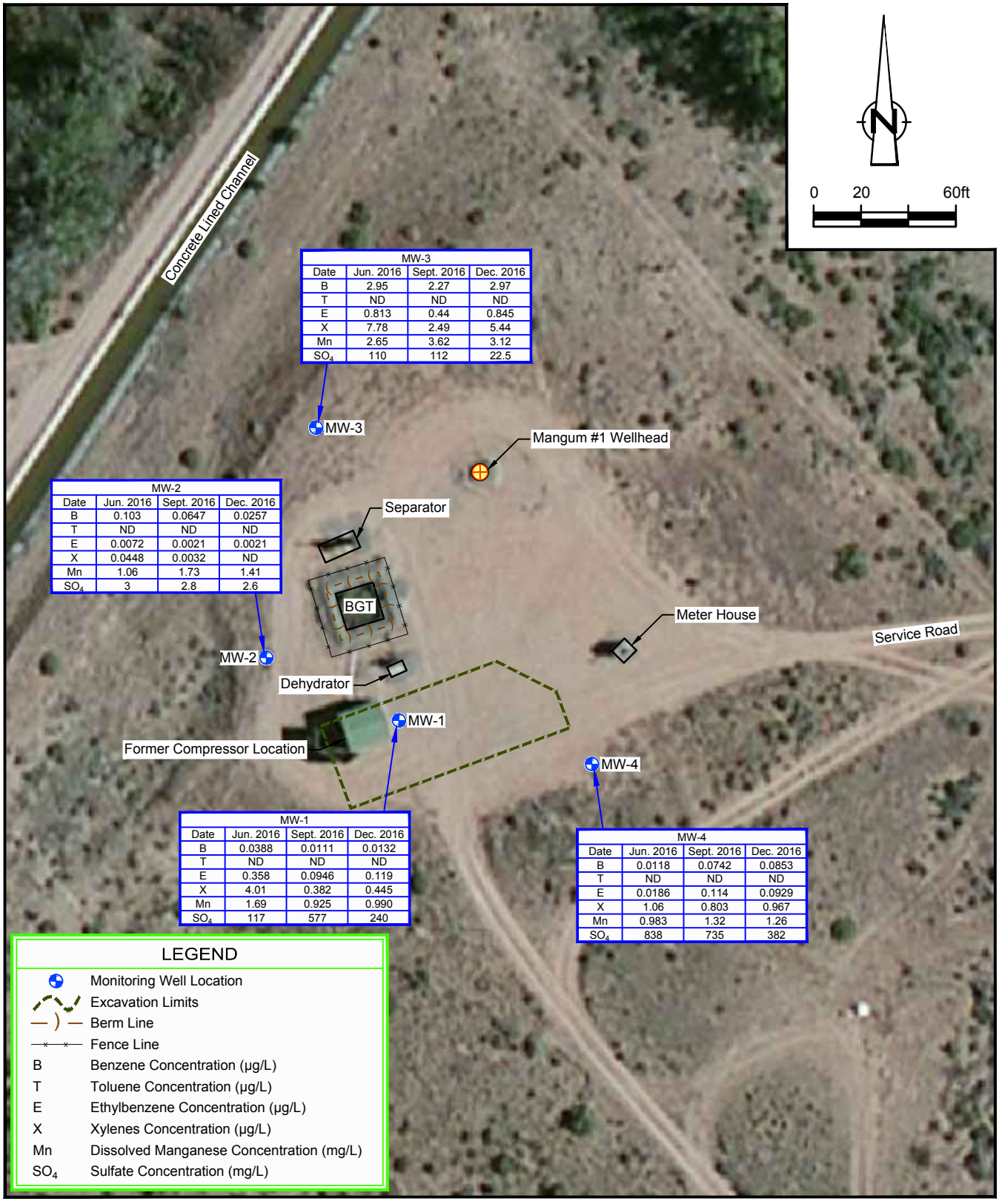


Figure 6

GROUNDWATER CONCENTRATIONS MAP
MANGUM #1
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

Tables

Table 1

Groundwater Elevations
ConocoPhillips Company
Mangum No.1
San Juan County, New Mexico

Well ID	Top of Casing (feet)	Date of Measurement	Depth to Water (feet)	Groundwater Elevation (feet)
MW-1	98.97	6/8/2016	15.12	83.85
		9/12/2016	14.75	84.22
		11/29/2016	15.06	83.91
MW-2	101.05	6/8/2016	17.49	83.56
		9/12/2016	17.28	84.07
		11/29/2016	17.62	83.43
MW-3	101.35	6/8/2016	18.47	82.88
		9/12/2016	18.41	82.94
		11/29/2016	18.84	82.51
MW-4	103.76	6/8/2016	19.72	84.04
		9/12/2016	19.43	84.33
		11/29/2016	19.62	84.14

Table 2

Field Parameters
ConocoPhillips Company
Mangum No.1
San Juan County, New Mexico

Well ID	Date	Temp˚C	pH	TDS (g/L)	SC (µS/cm)	DO (mg/L)	ORP (mV)	Volume (gal)
MW-1	11/29/2016	16.54	7.42	--	2.607	1.52	-155.3	--
MW-2	11/29/2016	16.04	7.2	--	2.299	2.21	-109.3	--
MW-3	11/29/2016	15.01	7.09	--	3.091	2.52	-91	--
MW-4	6/23/2016	15.1	7.29	--	2.95	1.04	-148.5	1.5
	11/29/2016	16.01	7.4	--	2.396	1.59	-127.5	--

Notes:
TDS = total dissolved solids
SC = Soil Conductivity
DO = dissolved oxygen
ORP = oxidation-reduction potential

Table 3

Groundwater Laboratory Analytical Results Summary
ConocoPhillips Company
Mangum No.1
San Juan County, New Mexico

Well ID	Sample ID	Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	Sulfate (mg/L)	Manganese (Dissolved) (mg/L)	Total Dissolved Solids (mg/L)
NMWQCC Groundwater Quality Standards				**0.01**	**0.75**	**0.75**	**0.62**	**600**	**0.2**	**1000**
MW-1	WT-11102646-060816-JWMW1	6/8/2016	(orig)	**0.0388**	<0.020	0.358	**4.01**	**1170**	**1.69**	**2590**
	GW-11102646-091216-CM-MW-1	9/12/2016	(orig)	**0.0111**	< 0.001	0.0946	0.382	577	**0.925**	--
	GW-11102646-112916-CN-MW-1	11/29/2016	(orig)	**0.0132**	< 0.001	0.119	0.445	240	**0.990**	--
MW-2	WT-11102646-060816-JW-MW-2	6/8/2016	(orig)	**0.103**	< 0.001	0.0072	0.0448	3.0	**1.06**	**1580**
	GW-11102646-091216-CM-MW-2	9/12/2016	(orig)	**0.0647**	< 0.001	0.0021	0.0032	2.8	**1.73**	--
	GW-11102646-112916-CN-MW-2	11/29/2016	(orig)	**0.0257**	< 0.001	0.0021	< 0.003	2.6	**1.41**	--
MW-3	WT-11102646-060816-JW-MW-3	6/8/2016	(orig)	**2.95**	<0.020	**0.813**	**7.78**	110	**2.65**	**2190**
	GW-11102646-091216-CM-MW-3	9/12/2016	(orig)	**2.27**	< 0.001	0.44	**2.49**	112	**3.62**	--
	GW-11102646-091216-CN-MW-3	11/29/2016	(orig)	**2.97**	< 0.001	**0.845**	**5.44**	22.5	**3.12**	--
MW-4	GW-11102646-062316-SP-MW-4	6/23/2016	(orig)	**0.118**	< 0.001	0.186	**1.06**	**838**	**0.983**	--
	GW-11102646-091216-CM-MW-4	9/12/2016	(orig)	**0.0742**	< 0.001	0.114	**0.803**	**735**	**1.32**	--
	GW-11102646-112916-CN-MW-4	11/29/2016	(orig)	**0.0853**	< 0.001	0.0929	**0.967**	382	**1.26**	--

Notes:
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
< 0.001 = Below Laboratory Detection Limit of 0.001 mg/L, etc
-- = Not Analyzed

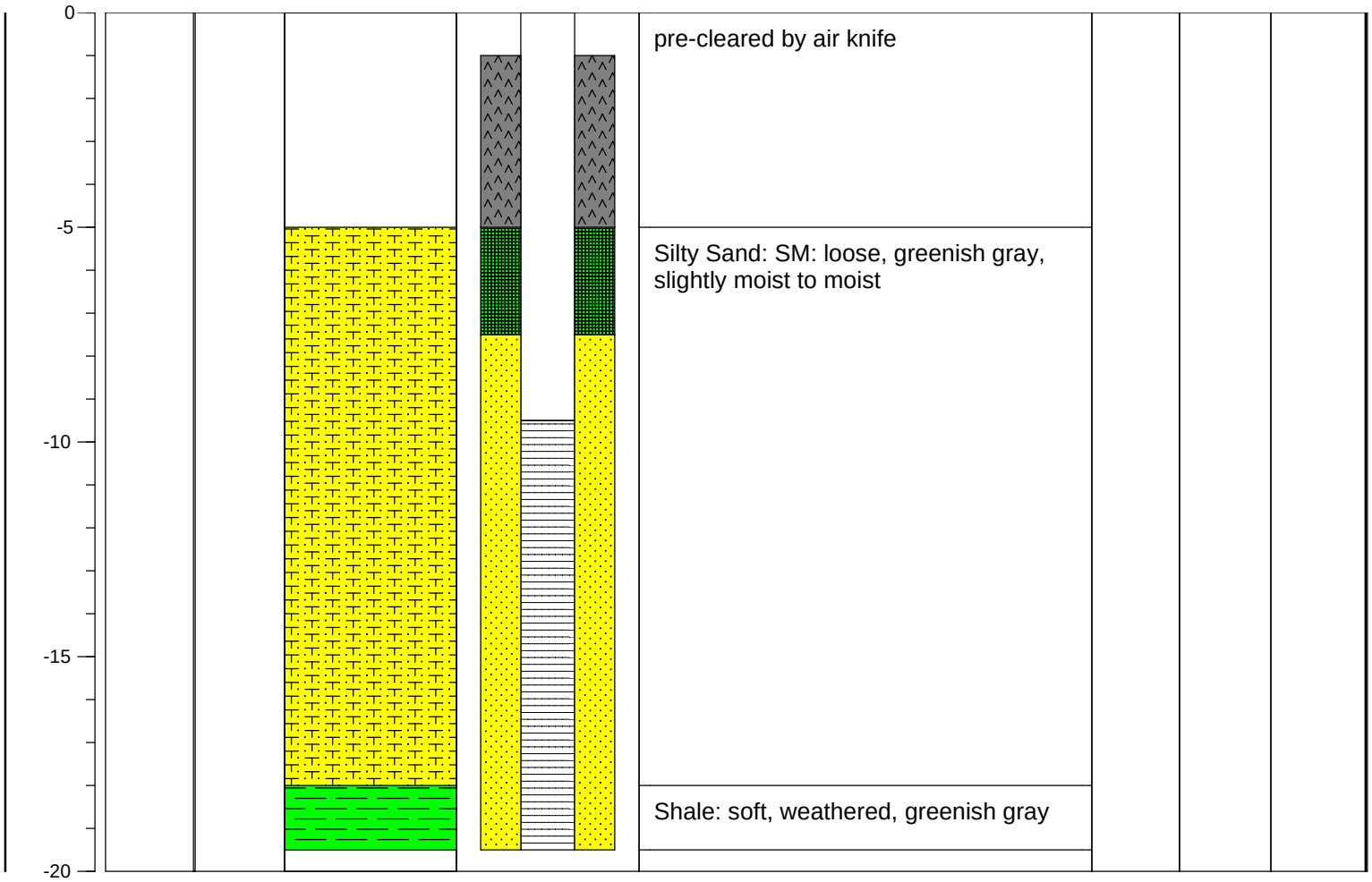
Appendices

Appendix A
Boring Logs/Well Completion Diagrams

PROJECT NAME: Mangum No. 1
LOCATION: San Juan County, New Mexico
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): No survey data available
GROUNDWATER ELEVATION (msl):
REMARKS:
COORDINATES:

SOIL BORING NO: MW-1
DRILL TYPE: Stratex
CME-85
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: Yellow Jacket Drilling
DATE/TIME HOLE STARTED: 5/26/2016
DATE/TIME HOLE COMPLETED: 5/26/2016

DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	PID (ppm)	Total BTEX (mg/kg)	Total TPH (mg/kg)



TD = 19.5 feet bgs

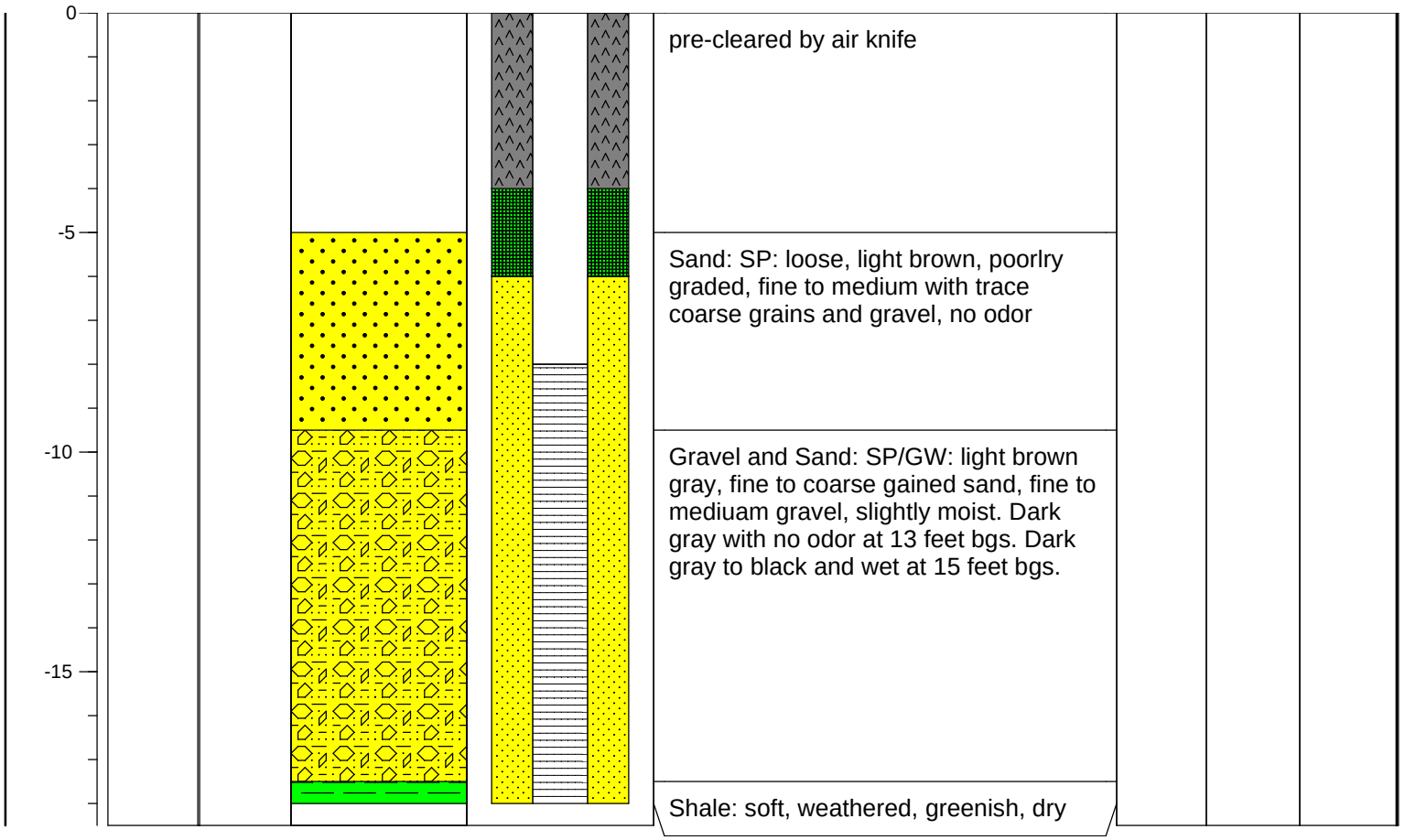
GHD Services Inc.

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: Mangum No. 1
LOCATION: San Juan County, New Mexico
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): No survey data available
GROUNDWATER ELEVATION (msl):
REMARKS:
COORDINATES:

SOIL BORING NO: MW-2
DRILL TYPE: Stratex
CME-85
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: Yellow Jacket Drilling
DATE/TIME HOLE STARTED: 5/26/2016
DATE/TIME HOLE COMPLETED: 5/26/2016

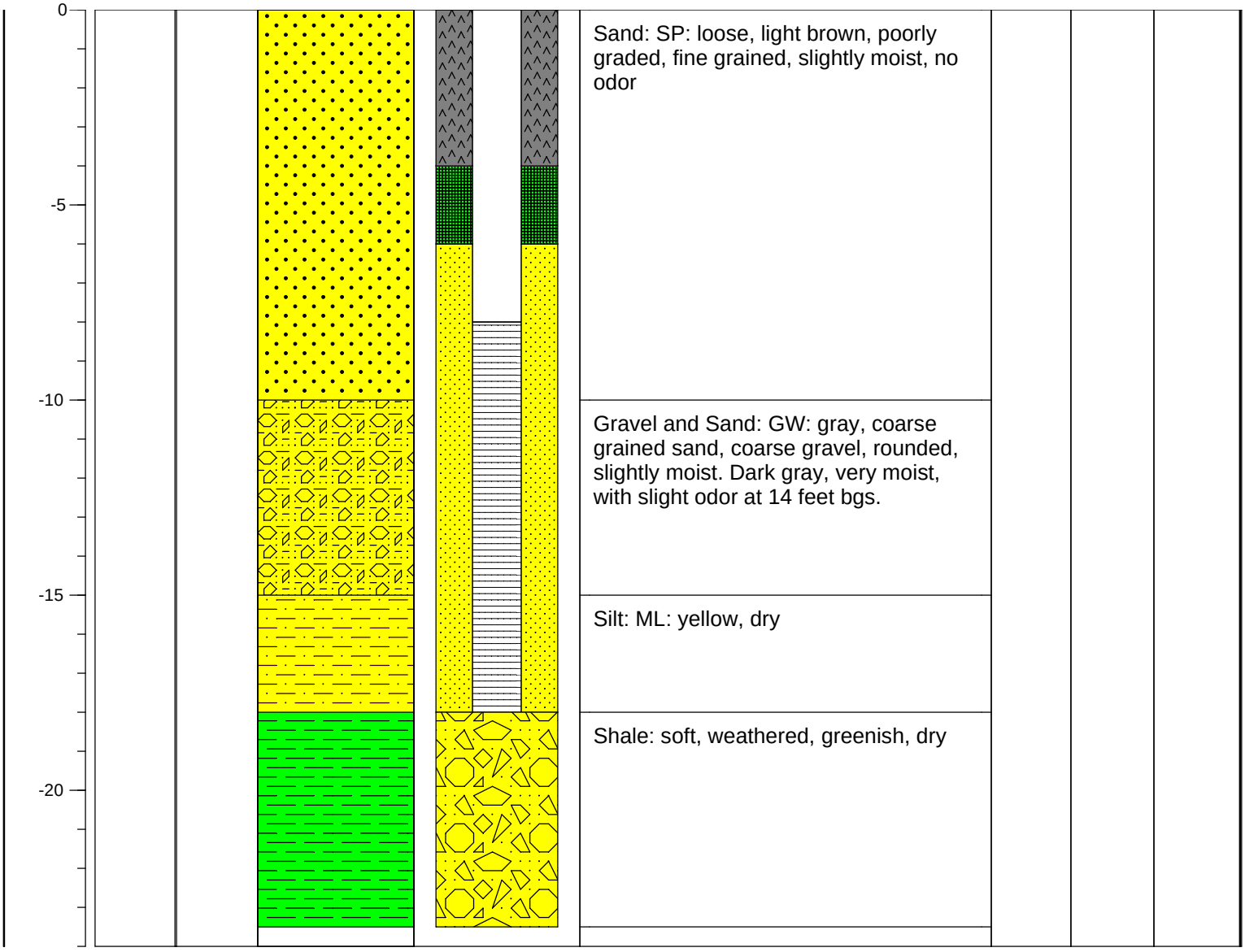
DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	PID (ppm)	Total BTEX (mg/kg)	Total TPH (mg/kg)



PROJECT NAME: Mangum No. 1
LOCATION: San Juan County, New Mexico
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): No survey data available
GROUNDWATER ELEVATION (msl):
REMARKS:
COORDINATES:

SOIL BORING NO: MW-3
DRILL TYPE: Stratex
CME-85
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: Yellow Jacket Drilling
DATE/TIME HOLE STARTED: 5/26/2016
DATE/TIME HOLE COMPLETED: 5/26/2016

DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	PID (ppm)	Total BTEX (mg/kg)	Total TPH (mg/kg)
0					Sand: SP: loose, light brown, poorly graded, fine grained, slightly moist, no odor			
-5								
-10					Gravel and Sand: GW: gray, coarse grained sand, coarse gravel, rounded, slightly moist. Dark gray, very moist, with slight odor at 14 feet bgs.			
-15					Silt: ML: yellow, dry			
-20					Shale: soft, weathered, greenish, dry			



TD = 23.5 feet bgs

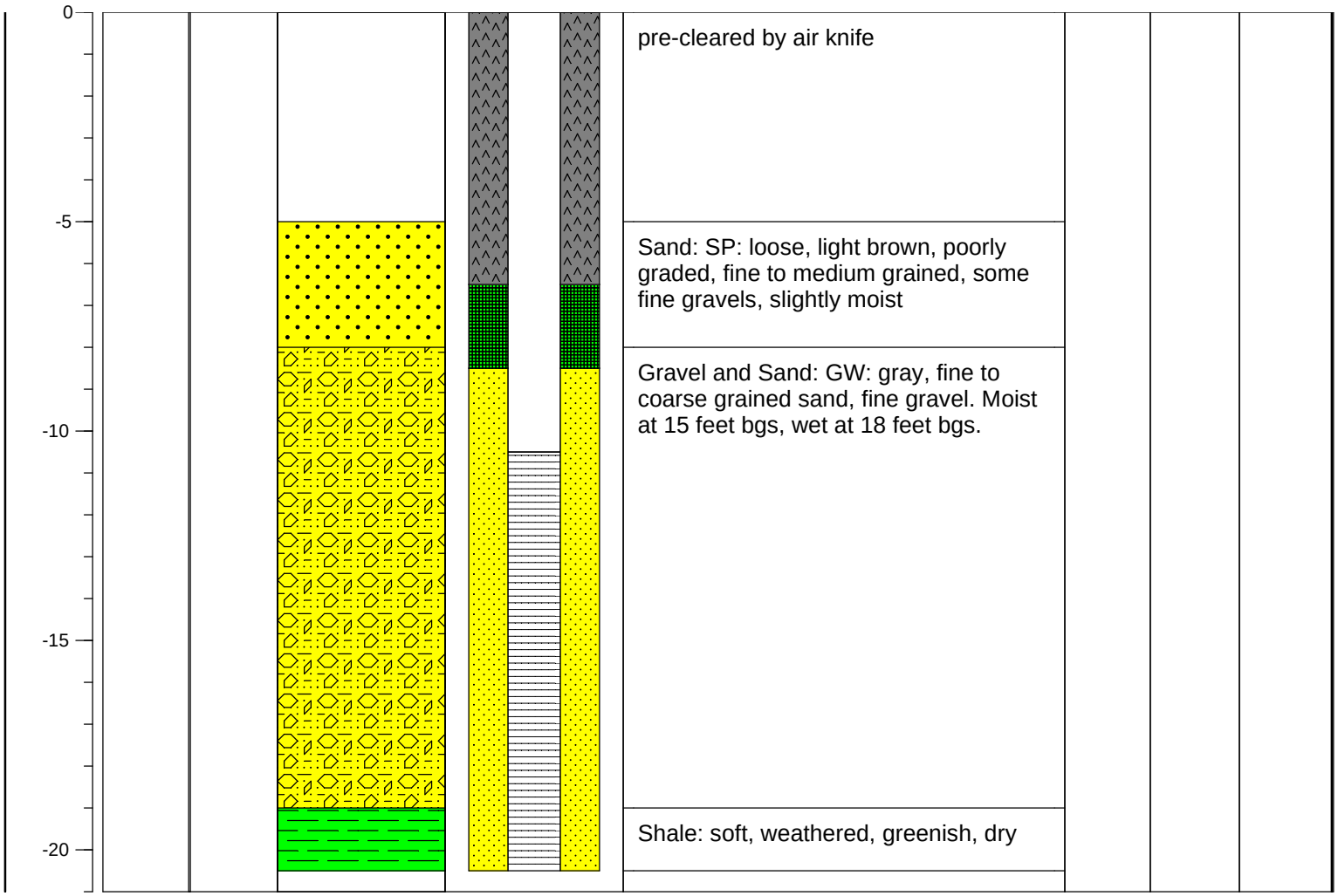
GHD Services Inc.

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: Mangum No. 1
LOCATION: San Juan County, New Mexico
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): No survey data available
GROUNDWATER ELEVATION (msl):
REMARKS:
COORDINATES:

SOIL BORING NO: MW-4
DRILL TYPE: Stratex
CME-85
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: Yellow Jacket Drilling
DATE/TIME HOLE STARTED: 5/26/2016
DATE/TIME HOLE COMPLETED: 5/26/2016

DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	PID (ppm)	Total BTEX (mg/kg)	Total TPH (mg/kg)



TD = 20.5 feet bgs

GHD Services Inc.

BORING LOG AND WELL COMPLETION FORM

Appendix B
Groundwater Laboratory Analytical Reports

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

June 22, 2016

Jeffrey Walker
GHD Services, Inc
6121 Indian School Rd NE
Ste 200
Albuquerque, NM 87110

RE: Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Dear Jeffrey Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on June 10, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Alice Flanagan
alice.flanagan@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60221153001	**WT-11102646-060816-JW-MW1**	Water	06/08/16 15:35	06/10/16 10:20
60221153002	**WT-11102646-060816-JW-MW2**	Water	06/08/16 15:15	06/10/16 10:20
60221153003	**WT-11102646-060816-JW-MW3**	Water	06/08/16 14:30	06/10/16 10:20

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60221153001	**WT-11102646-060816-JW-MW1**	EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1
60221153002	**WT-11102646-060816-JW-MW2**	EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1
60221153003	**WT-11102646-060816-JW-MW3**	EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: June 22, 2016

General Information:
3 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

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

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

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

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

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

Additional Comments:

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Method: **EPA 5030B/8260**
Description: 8260 MSV
Client: GHD Services_COP NM
Date: June 22, 2016

General Information:
3 samples were analyzed for EPA 5030B/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

pH: Post-analysis pH measurement indicates insufficient VOA sample preservation.
- WT-11102646-060816-JW-MW3 (Lab ID: 60221153003)

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

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

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

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

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

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

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

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

QC Batch: MSV/76443

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: MSV/76476

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: GHD Services_COP NM
Date: June 22, 2016

General Information:
3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: June 22, 2016

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

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

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

Additional Comments:

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

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ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Sample: WT-11102646-060816-JW-MW1 **Lab ID: 60221153001** Collected: 06/08/16 15:35 Received: 06/10/16 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1690**	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:23	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Benzene	**38.8**	ug/L	20.0	20		06/16/16 17:50	71-43-2	
Ethylbenzene	**358**	ug/L	20.0	20		06/16/16 17:50	100-41-4	
Toluene	ND	ug/L	20.0	20		06/16/16 17:50	108-88-3	
Xylene (Total)	**4010**	ug/L	60.0	20		06/16/16 17:50	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	77-130	20		06/16/16 17:50	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	81-127	20		06/16/16 17:50	17060-07-0	
Toluene-d8 (S)	101	%	80-120	20		06/16/16 17:50	2037-26-5	
Preservation pH	**1.0**		0.10	20		06/16/16 17:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2590**	mg/L	5.0	1		06/14/16 13:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**1170**	mg/L	100	100		06/21/16 14:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Sample: WT-11102646-060816-JW-MW2 **Lab ID: 60221153002** Collected: 06/08/16 15:15 Received: 06/10/16 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1060**	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:27	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Benzene	**103**	ug/L	1.0	1		06/15/16 17:19	71-43-2	
Ethylbenzene	**7.2**	ug/L	1.0	1		06/15/16 17:19	100-41-4	
Toluene	ND	ug/L	1.0	1		06/15/16 17:19	108-88-3	
Xylene (Total)	**44.8**	ug/L	3.0	1		06/15/16 17:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	77-130	1		06/15/16 17:19	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	81-127	1		06/15/16 17:19	17060-07-0	
Toluene-d8 (S)	108	%	80-120	1		06/15/16 17:19	2037-26-5	
Preservation pH	**1.0**		0.10	1		06/15/16 17:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1580**	mg/L	5.0	1		06/14/16 13:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**3.0**	mg/L	1.0	1		06/21/16 15:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Sample: WT-11102646-060816-JW-MW3 **Lab ID: 60221153003** Collected: 06/08/16 14:30 Received: 06/10/16 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**2650**	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:31	7439-96-5	
8260 MSV	Analytical Method: EPA 5030B/8260							
Benzene	**2950**	ug/L	20.0	20		06/16/16 18:05	71-43-2	
Ethylbenzene	**813**	ug/L	20.0	20		06/16/16 18:05	100-41-4	
Toluene	ND	ug/L	20.0	20		06/16/16 18:05	108-88-3	
Xylene (Total)	**7780**	ug/L	60.0	20		06/16/16 18:05	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	77-130	20		06/16/16 18:05	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	81-127	20		06/16/16 18:05	17060-07-0	
Toluene-d8 (S)	100	%	80-120	20		06/16/16 18:05	2037-26-5	
Preservation pH	**6.0**		0.10	20		06/16/16 18:05		pH
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2190**	mg/L	5.0	1		06/14/16 13:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**110**	mg/L	10.0	10		06/21/16 15:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

QC Batch: MPRP/36317 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60221153001, 60221153002, 60221153003

METHOD BLANK: 1775614 Matrix: Water
Associated Lab Samples: 60221153001, 60221153002, 60221153003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	06/15/16 14:42	

LABORATORY CONTROL SAMPLE: 1775615

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1775616 1775617

Parameter	Units	60221108001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	0.70 mg/L	1000	1000	1700	1680	100	98	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

QC Batch: MSV/76443
QC Batch Method: EPA 5030B/8260
Analysis Method: EPA 5030B/8260
Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60221153002

METHOD BLANK: 1776644
Matrix: Water
Associated Lab Samples: 60221153002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/15/16 14:26	
Ethylbenzene	ug/L	ND	1.0	06/15/16 14:26	
Toluene	ug/L	ND	1.0	06/15/16 14:26	
Xylene (Total)	ug/L	ND	3.0	06/15/16 14:26	
1,2-Dichloroethane-d4 (S)	%	101	81-127	06/15/16 14:26	
4-Bromofluorobenzene (S)	%	101	77-130	06/15/16 14:26	
Toluene-d8 (S)	%	103	80-120	06/15/16 14:26	

LABORATORY CONTROL SAMPLE: 1776645

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	18.8	94	79-116	
Ethylbenzene	ug/L	20	19.5	97	80-120	
Toluene	ug/L	20	19.4	97	80-120	
Xylene (Total)	ug/L	60	58.9	98	80-120	
1,2-Dichloroethane-d4 (S)	%			103	81-127	
4-Bromofluorobenzene (S)	%			101	77-130	
Toluene-d8 (S)	%			104	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

QC Batch: MSV/76476
QC Batch Method: EPA 5030B/8260
Analysis Method: EPA 5030B/8260
Analysis Description: 8260 MSV Water 10 mL Purge
Associated Lab Samples: 60221153001, 60221153003

METHOD BLANK: 1777507
Matrix: Water
Associated Lab Samples: 60221153001, 60221153003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/16/16 13:45	
Ethylbenzene	ug/L	ND	1.0	06/16/16 13:45	
Toluene	ug/L	ND	1.0	06/16/16 13:45	
Xylene (Total)	ug/L	ND	3.0	06/16/16 13:45	
1,2-Dichloroethane-d4 (S)	%	99	81-127	06/16/16 13:45	
4-Bromofluorobenzene (S)	%	98	77-130	06/16/16 13:45	
Toluene-d8 (S)	%	100	80-120	06/16/16 13:45	

LABORATORY CONTROL SAMPLE: 1777508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	20.0	100	79-116	
Ethylbenzene	ug/L	20	19.4	97	80-120	
Toluene	ug/L	20	19.6	98	80-120	
Xylene (Total)	ug/L	60	60.1	100	80-120	
1,2-Dichloroethane-d4 (S)	%			100	81-127	
4-Bromofluorobenzene (S)	%			99	77-130	
Toluene-d8 (S)	%			100	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

QC Batch: WET/62374 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60221153001, 60221153002, 60221153003

METHOD BLANK: 1775869 Matrix: Water
Associated Lab Samples: 60221153001, 60221153002, 60221153003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	06/14/16 13:13	

LABORATORY CONTROL SAMPLE: 1775870

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	967	97	80-120	

SAMPLE DUPLICATE: 1775871

Parameter	Units	60220983002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1050	1070	2	10	

SAMPLE DUPLICATE: 1775872

Parameter	Units	60221030001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	338	352	4	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

QC Batch: WETA/40171 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60221153001, 60221153002, 60221153003

METHOD BLANK: 1779589 Matrix: Water
Associated Lab Samples: 60221153001, 60221153002, 60221153003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	06/21/16 08:58	

LABORATORY CONTROL SAMPLE: 1779590

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1779591 1779592

Parameter	Units	60221033002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	260	100	100	357	356	97	96	80-120	0	15	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/76443

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/76476

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

pH Post-analysis pH measurement indicates insufficient VOA sample preservation.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11102646 COP Magnum No1
Pace Project No.: 60221153

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60221153001	**WT-11102646-060816-JW-MW1**	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153002	**WT-11102646-060816-JW-MW2**	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153003	**WT-11102646-060816-JW-MW3**	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153001	**WT-11102646-060816-JW-MW1**	EPA 5030B/8260	MSV/76476		
60221153002	**WT-11102646-060816-JW-MW2**	EPA 5030B/8260	MSV/76443		
60221153003	**WT-11102646-060816-JW-MW3**	EPA 5030B/8260	MSV/76476		
60221153001	**WT-11102646-060816-JW-MW1**	SM 2540C	WET/62374		
60221153002	**WT-11102646-060816-JW-MW2**	SM 2540C	WET/62374		
60221153003	**WT-11102646-060816-JW-MW3**	SM 2540C	WET/62374		
60221153001	**WT-11102646-060816-JW-MW1**	EPA 300.0	WETA/40171		
60221153002	**WT-11102646-060816-JW-MW2**	EPA 300.0	WETA/40171		
60221153003	**WT-11102646-060816-JW-MW3**	EPA 300.0	WETA/40171		

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Sample Condition Upon Receipt

WO# : 60221153

60221153

Client Name: GHD

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 6508 8165 1964 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☑ None ☐ Other ☐

Thermometer Used: CF -0.1 T-239 / CF 0.0 T-262

Type of Ice: Wet Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 4.1

Temperature should be above freezing to 6°C

Date and initials of person examining contents: BB 6/10/16

Chain of Custody present:	☑Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☑Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☑Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☑Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	7.
Sufficient volume:	☑Yes ☐No ☐N/A	8.
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	9.
Containers intact:	☑Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	12.
Sample labels match COC: Includes date/time/ID/analyses Y Matrix: WT	☑Yes ☐No ☐N/A	13.
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☑Yes ☐No	Initial when completed / Lot # of added preservative
Trip Blank present: Pace Trip Blank lot # (if purchased):	☐Yes ☑No ☐N/A	15.
Headspace in VOA vials (>6mm):	☐Yes ☑No ☑N/A BB 6/10	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☑N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☑N/A	18.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 6/10/16

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 1

Section A – Required Client Information:		Section B – Required Project Information:		Section C – Invoice Information:	
Company:	GHD Services_COP NM	Report To:	Christine Mathews	Attention:	
Address:	6212 Indian School Rd. NE St2	Copy To:	Jeff Walker	Company Name:	
	Albuquerque, NM 87110		Angela Bown	Address:	
Email:	christine.mathews@ghd.com	Purchase Order #:		Pace Quote:	
Phone:	505-884-0672 Fax:	Project Name:	~~074937 Wilmuth No1 COP~~ Mangum	Pace Project Manager:	alice.flanagan@pacelabs.com,
Requested Due Date:		Project #:	11102646 COP	Pace Profile #:	

Regulatory Agency

State / Location: NM

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Sulfate	Dissolved Mn-field filtered	TDS	BTEX 8260		BP3U	BP3N		Residual Chlorine (Y/N)	00221153
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS / CODE												(3)	(2)				Y	N	N	N							
1	WT-11102646-060816-SW-MW1	WT	G	6/8/16	1535	—	—						X	X				X	X	X	X			BP3U		BP3N		3DG9H	001
2	WT-11102646-060816-SW-MW2	↓	G	↓	1515								X	X				X	X	X	X			↓		↓		↓	002
3	WT-11102646-060816-SW-MW3	↓	G	↓	1430								X	X				X	X	X	X			↓		↓		↓	003
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jeff Walker/GHD	6/9/16	0810		6/10/16	1020	4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE			TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:						
SIGNATURE of SAMPLER:	DATE Signed:					

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 07, 2016

Christine Mathews
GHD Services, Inc.
6212 Indian School Rd. NE St2
Albuquerque, NM 87110

RE: Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Dear Christine Mathews:
Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Alice Flanagan
alice.flanagan@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Jeffrey Walker, GHD Services, Inc

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CERTIFICATIONS

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587

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SAMPLE SUMMARY

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60222266001	**GW-11102646-062316-SP-MW4**	Water	06/23/16 12:12	06/27/16 08:30
60222266002	**GW-11102646-062316-SP-DUP**	Water	06/23/16 00:00	06/27/16 08:30
60222266003	**TRIP BLANK**	Water	06/23/16 12:12	06/27/16 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60222266001	**GW-11102646-062316-SP-MW4**	EPA 6010	JGP	1
		EPA 8260	JDH, JTK	9
		EPA 300.0	OL	1
60222266002	**GW-11102646-062316-SP-DUP**	EPA 8260	JDH, JTK	9
60222266003	**TRIP BLANK**	EPA 8260	JTK	9

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: July 07, 2016

General Information:
1 sample was analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Method: **EPA 8260**
Description: 8260 MSV GRO and Oxygenates
Client: GHD Services_COP NM
Date: July 07, 2016

General Information:
3 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

pH: Post-analysis pH measurement indicates insufficient VOA sample preservation.
- GW-11102646-062316-SP-DUP (Lab ID: 60222266002)

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

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

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

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

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

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

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

QC Batch: MSV/76710

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- LCS (Lab ID: 1784775)
  - Benzene

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

QC Batch: MSV/76710

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60222142002,60222142010

R1: RPD value was outside control limits.
- MSD (Lab ID: 1784777)
  - Benzene
  - Ethylbenzene
  - Toluene

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: July 07, 2016

General Information:
1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

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

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

Additional Comments:

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

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ANALYTICAL RESULTS

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Sample: GW-11102646-062316-SP-MW4 **Lab ID: 60222266001** Collected: 06/23/16 12:12 Received: 06/27/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**983**	ug/L	5.0	1	06/28/16 10:45	06/29/16 09:20	7439-96-5	
8260 MSV GRO and Oxygenates	Analytical Method: EPA 8260							
Benzene	**118**	ug/L	5.0	5		06/30/16 09:47	71-43-2	
Ethylbenzene	**186**	ug/L	5.0	5		06/30/16 09:47	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 01:48	108-88-3	
TPH-GRO	**14500**	ug/L	2500	5		06/30/16 09:47		
Xylene (Total)	**1060**	ug/L	15.0	5		06/30/16 09:47	1330-20-7	
Surrogates								
Toluene-d8 (S)	105	%	80-120	1		06/29/16 01:48	2037-26-5	
4-Bromofluorobenzene (S)	101	%	77-130	1		06/29/16 01:48	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		06/29/16 01:48	17060-07-0	
Preservation pH	**1.0**		0.10	1		06/29/16 01:48		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**838**	mg/L	100	100		06/28/16 10:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Sample: GW-11102646-062316-SP-DUP **Lab ID: 60222266002** Collected: 06/23/16 00:00 Received: 06/27/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV GRO and Oxygenates	Analytical Method: EPA 8260							
Benzene	**119**	ug/L	5.0	5		06/30/16 10:06	71-43-2	
Ethylbenzene	**185**	ug/L	5.0	5		06/30/16 10:06	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 02:03	108-88-3	
TPH-GRO	**16400**	ug/L	2500	5		06/30/16 10:06		
Xylene (Total)	**1030**	ug/L	15.0	5		06/30/16 10:06	1330-20-7	
Surrogates								
Toluene-d8 (S)	105	%	80-120	1		06/29/16 02:03	2037-26-5	
4-Bromofluorobenzene (S)	104	%	77-130	1		06/29/16 02:03	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		06/29/16 02:03	17060-07-0	
Preservation pH	**4.0**		0.10	1		06/29/16 02:03		pH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Sample: TRIP BLANK **Lab ID: 60222266003** Collected: 06/23/16 12:12 Received: 06/27/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV GRO and Oxygenates	Analytical Method: EPA 8260							
Benzene	ND	ug/L	1.0	1		06/29/16 02:18	71-43-2	L1
Ethylbenzene	ND	ug/L	1.0	1		06/29/16 02:18	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 02:18	108-88-3	
TPH-GRO	ND	ug/L	500	1		06/29/16 02:18		
Xylene (Total)	ND	ug/L	3.0	1		07/05/16 14:06	1330-20-7	
Surrogates								
Toluene-d8 (S)	97	%	80-120	1		06/29/16 02:18	2037-26-5	
4-Bromofluorobenzene (S)	99	%	77-130	1		06/29/16 02:18	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	81-127	1		06/29/16 02:18	17060-07-0	
Preservation pH	**1.0**		0.10	1		06/29/16 02:18		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

QC Batch: MPRP/36479
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60222266001

METHOD BLANK: 1784029 Matrix: Water
Associated Lab Samples: 60222266001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	06/29/16 09:13	

LABORATORY CONTROL SAMPLE: 1784030

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	1000	972	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784031 1784032

Parameter	Units	60222267002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	2260	1000	1000	3110	3120	85	85	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

QC Batch: MSV/76710 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV MO GRO Oxygenates
Associated Lab Samples: 60222266001, 60222266002, 60222266003

METHOD BLANK: 1784774 Matrix: Water
Associated Lab Samples: 60222266001, 60222266002, 60222266003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/29/16 01:19	
Ethylbenzene	ug/L	ND	1.0	06/29/16 01:19	
Toluene	ug/L	ND	1.0	06/29/16 01:19	
TPH-GRO	ug/L	ND	500	06/29/16 01:19	
1,2-Dichloroethane-d4 (S)	%	97	81-127	06/29/16 01:19	
4-Bromofluorobenzene (S)	%	100	77-130	06/29/16 01:19	
Toluene-d8 (S)	%	95	80-120	06/29/16 01:19	

LABORATORY CONTROL SAMPLE: 1784775

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	23.8	119	79-116	L0
Ethylbenzene	ug/L	20	21.4	107	81-110	
Toluene	ug/L	20	21.7	108	82-111	
TPH-GRO	ug/L	4000	4960	124	58-138	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			98	77-130	
Toluene-d8 (S)	%			96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784776 1784777

Parameter	Units	60222142002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	20.2	12.1	98	58	37-151	50	40	R1
Ethylbenzene	ug/L	ND	20	20	17.4	10	87	50	29-151	54	45	R1
Toluene	ug/L	ND	20	20	17.5	10.2	87	51	37-147	53	43	R1
1,2-Dichloroethane-d4 (S)	%						99	99	81-127			
4-Bromofluorobenzene (S)	%						99	99	77-130			
Toluene-d8 (S)	%						95	94	80-120			
Preservation pH		11.0			11.0	11.0				0		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784778 1784779

Parameter	Units	60222142010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	16.6	13.6	78	63	37-151	20	40	
Ethylbenzene	ug/L	ND	20	20	14.1	11.1	68	53	29-151	24	45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784778 1784779

Parameter	Units	60222142010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Toluene	ug/L	ND	20	20	14.3	11.3	70	55	37-147	23	43	
1,2-Dichloroethane-d4 (S)	%						99	99	81-127			
4-Bromofluorobenzene (S)	%						98	100	77-130			
Toluene-d8 (S)	%						94	94	80-120			
Preservation pH		11.0			11.0	11.0				0		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

QC Batch: MSV/76735 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV MO GRO Oxygenates
Associated Lab Samples: 60222266001, 60222266002

METHOD BLANK: 1785516 Matrix: Water
Associated Lab Samples: 60222266001, 60222266002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/30/16 05:31	
Ethylbenzene	ug/L	ND	1.0	06/30/16 05:31	
TPH-GRO	ug/L	ND	500	06/30/16 05:31	
Xylene (Total)	ug/L	ND	3.0	06/30/16 05:31	
1,2-Dichloroethane-d4 (S)	%	99	81-127	06/30/16 05:31	
4-Bromofluorobenzene (S)	%	101	77-130	06/30/16 05:31	
Toluene-d8 (S)	%	101	80-120	06/30/16 05:31	

LABORATORY CONTROL SAMPLE: 1785517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.1	96	79-116	
Ethylbenzene	ug/L	20	19.4	97	81-110	
TPH-GRO	ug/L	4000	4460	112	58-138	
Xylene (Total)	ug/L	60	57.6	96	80-111	
1,2-Dichloroethane-d4 (S)	%			99	81-127	
4-Bromofluorobenzene (S)	%			99	77-130	
Toluene-d8 (S)	%			101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1785518 1785519

Parameter	Units	60222424003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	0.0024 mg/L	20	20	19.9	18.9	88	83	37-151	5	40	
Ethylbenzene	ug/L	ND	20	20	17.3	17.7	86	88	29-151	2	45	
Xylene (Total)	ug/L	ND	60	60	52.3	52.5	87	87	27-156	0	46	
1,2-Dichloroethane-d4 (S)	%						100	100	81-127			
4-Bromofluorobenzene (S)	%						102	101	77-130			
Toluene-d8 (S)	%						100	99	80-120			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

QC Batch: MSV/76821 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV MO GRO Oxygenates
Associated Lab Samples: 60222266003

METHOD BLANK: 1788379 Matrix: Water
Associated Lab Samples: 60222266003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Xylene (Total)	ug/L	ND	3.0	07/05/16 13:51	
1,2-Dichloroethane-d4 (S)	%	100	81-127	07/05/16 13:51	
4-Bromofluorobenzene (S)	%	107	77-130	07/05/16 13:51	
Toluene-d8 (S)	%	97	80-120	07/05/16 13:51	

LABORATORY CONTROL SAMPLE: 1788380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Xylene (Total)	ug/L	60	60.5	101	80-111	
1,2-Dichloroethane-d4 (S)	%			100	81-127	
4-Bromofluorobenzene (S)	%			102	77-130	
Toluene-d8 (S)	%			102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1788381 1788382

Parameter	Units	60222731006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Xylene (Total)	ug/L	0.027 mg/L	60	60	68.4	96.3	69	115	27-156	34	46	
1,2-Dichloroethane-d4 (S)	%						102	103	81-127			
4-Bromofluorobenzene (S)	%						100	98	77-130			
Toluene-d8 (S)	%						96	100	80-120			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

QC Batch: WETA/40299 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60222266001

METHOD BLANK: 1784001 Matrix: Water
Associated Lab Samples: 60222266001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	06/28/16 08:56	

LABORATORY CONTROL SAMPLE: 1784002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784003 1784004

Parameter	Units	60221593005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	79.2	25	25	106	106	109	106	80-120	1	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
R1	RPD value was outside control limits.
pH	Post-analysis pH measurement indicates insufficient VOA sample preservation.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11102646 COP Mangum No 1
Pace Project No.: 60222266

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60222266001	**GW-11102646-062316-SP-MW4**	EPA 3010	MPRP/36479	EPA 6010	ICP/26591
60222266001	**GW-11102646-062316-SP-MW4**	EPA 8260	MSV/76710		
60222266001	**GW-11102646-062316-SP-MW4**	EPA 8260	MSV/76735		
60222266002	**GW-11102646-062316-SP-DUP**	EPA 8260	MSV/76710		
60222266002	**GW-11102646-062316-SP-DUP**	EPA 8260	MSV/76735		
60222266003	**TRIP BLANK**	EPA 8260	MSV/76710		
60222266003	**TRIP BLANK**	EPA 8260	MSV/76821		
60222266001	**GW-11102646-062316-SP-MW4**	EPA 300.0	WETA/40299		

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www.pacelabs.com

Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60222266

60222266

Client Name: GHD COP

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7834 3312 2094 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☐ No ☒ Seals intact: Yes ☐ No ☒

Packing Material: Bubble Wrap ☐ Bubble Bags ☒ Foam ☒ None ☐ Other ☐

Thermometer Used: CF -0.1 T-239 / CF 0.0 T-262 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 2.0

Date and initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1. Ice melted completely, out of temp
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: WT		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☒Yes ☐No	Initial when completed / Lot # of added preservative
Trip Blank present:	☒Yes ☐No ☐N/A	
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	☐Yes ☒No ☐N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: J Walker Date/Time: 6/27/16 email

Comments/ Resolution: move forward with analysis

Project Manager Review: aaf Date: 6/27/16

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 0930	Start:
End: 0936	End:
Temp:	Temp:

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 1

Section A
Required Client Information:

Company:	GHD Services_COP NM
Address:	6121 Indian School Rd NE
	Albuquerque, NM 87110
Email:	jeff.walker@ghd.com
Phone:	505-377-3920 Fax:
Requested Due Date:	

Section B
Required Project Information:

Report To:	Jeffrey Walker
Copy To:	
Purchase Order #:	
Project Name:	11102646
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	alice.flanagan@pacelabs.com,
Pace Profile #:	8644, line 3?

Regulatory Agency
State / Location
NM

MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260 BTEX,GRO	~~DRO by 8015B~~	Sulfate	Dissolved Mn field filtered		Residual Chlorine (Y/N)	6022266
1	GW-11102646-062316-SP-MW4	WT	G	6/23/16	1212	—	—		5										X		X	X	001		TP34 BP3N 250 (3) DG4U
2	GW-11102646-062316-SP-DUP	WT	G	↓		—	—		3										X		~~X~~ SP		002		↓
3																							003		(3) DG4U TB
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Client provided trip blank	Steven Perez (GHD)	6/23/16	1525	[signature]	6/27	0830	2.0	N	N	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Steven Perez

SIGNATURE of SAMPLER: Steven Perez

DATE Signed: 6/23/16

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 28, 2016

Christine Mathews
GHD Services, Inc.
6212 Indian School Rd. NE St2
Albuquerque, NM 87110

RE: Project: 11102646 Magnum No1
Pace Project No.: 60227652

Dear Christine Mathews:
Enclosed are the analytical results for sample(s) received by the laboratory on September 14, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Alice Spiller

Alice Spiller
alice.spiller@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Jeffrey Walker, GHD Services, Inc

Pace Analytical Services, Inc.
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CERTIFICATIONS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587

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SAMPLE SUMMARY

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60227652001	**GW-11102646-091216-CM-MW-1**	Water	09/12/16 14:30	09/14/16 08:50
60227652002	**GW-11102646-091216-CM-MW-2**	Water	09/12/16 14:45	09/14/16 08:50
60227652003	**GW-11102646-091216-CM-MW-3**	Water	09/12/16 15:00	09/14/16 08:50
60227652004	**GW-11102646-091216-CM-MW-4**	Water	09/12/16 15:10	09/14/16 08:50
60227652005	**TB-11102646-091216-CM-001**	Water	09/12/16 14:15	09/14/16 08:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60227652001	**GW-11102646-091216-CM-MW-1**	EPA 6010	TDS	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60227652002	**GW-11102646-091216-CM-MW-2**	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652003	**GW-11102646-091216-CM-MW-3**	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652004	**GW-11102646-091216-CM-MW-4**	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652005	**TB-11102646-091216-CM-001**	EPA 8260	JTK	8

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PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: September 28, 2016

General Information:
4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Method: **EPA 8260**
Description: 8260 MSV UST, Water
Client: GHD Services_COP NM
Date: September 28, 2016

General Information:
5 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

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

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

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

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

QC Batch: 447129

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 447787

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

Pace Analytical Services, Inc.
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PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: September 28, 2016

General Information:
4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

Additional Comments:

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

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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Sample: GW-11102646-091216-CM-MW-1 **Lab ID: 60227652001** Collected: 09/12/16 14:30 Received: 09/14/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**925**	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:21	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**11.1**	ug/L	5.0	5		09/23/16 20:04	71-43-2	
Ethylbenzene	**94.6**	ug/L	5.0	5		09/23/16 20:04	100-41-4	
Toluene	ND	ug/L	5.0	5		09/23/16 20:04	108-88-3	
Xylene (Total)	**382**	ug/L	15.0	5		09/23/16 20:04	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	5		09/23/16 20:04	2037-26-5	
4-Bromofluorobenzene (S)	104	%	77-130	5		09/23/16 20:04	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	81-127	5		09/23/16 20:04	17060-07-0	
Preservation pH	**1.0**		1.0	5		09/23/16 20:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**577**	mg/L	50.0	50		09/27/16 19:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Sample: GW-11102646-091216-CM-MW-2 **Lab ID: 60227652002** Collected: 09/12/16 14:45 Received: 09/14/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1730**	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:27	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**64.7**	ug/L	1.0	1		09/21/16 06:45	71-43-2	
Ethylbenzene	**2.1**	ug/L	1.0	1		09/21/16 06:45	100-41-4	
Toluene	ND	ug/L	1.0	1		09/21/16 06:45	108-88-3	
Xylene (Total)	**3.2**	ug/L	3.0	1		09/21/16 06:45	1330-20-7	
Surrogates								
Toluene-d8 (S)	103	%	80-120	1		09/21/16 06:45	2037-26-5	
4-Bromofluorobenzene (S)	107	%	77-130	1		09/21/16 06:45	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	81-127	1		09/21/16 06:45	17060-07-0	
Preservation pH	**1.0**		1.0	1		09/21/16 06:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		09/27/16 19:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Sample: GW-11102646-091216-CM-MW-3 **Lab ID: 60227652003** Collected: 09/12/16 15:00 Received: 09/14/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**3620**	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:30	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**2270**	ug/L	20.0	20		09/21/16 07:00	71-43-2	
Ethylbenzene	**440**	ug/L	20.0	20		09/21/16 07:00	100-41-4	
Toluene	ND	ug/L	20.0	20		09/21/16 07:00	108-88-3	
Xylene (Total)	**2490**	ug/L	60.0	20		09/21/16 07:00	1330-20-7	
Surrogates								
Toluene-d8 (S)	98	%	80-120	20		09/21/16 07:00	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	20		09/21/16 07:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	81-127	20		09/21/16 07:00	17060-07-0	
Preservation pH	**1.0**		1.0	20		09/21/16 07:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**112**	mg/L	10.0	10		09/27/16 20:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Sample: GW-11102646-091216-CM-MW-4 **Lab ID: 60227652004** Collected: 09/12/16 15:10 Received: 09/14/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1320**	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:32	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**74.2**	ug/L	5.0	5		09/21/16 07:14	71-43-2	
Ethylbenzene	**114**	ug/L	5.0	5		09/21/16 07:14	100-41-4	
Toluene	ND	ug/L	5.0	5		09/21/16 07:14	108-88-3	
Xylene (Total)	**803**	ug/L	15.0	5		09/21/16 07:14	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	5		09/21/16 07:14	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	5		09/21/16 07:14	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	5		09/21/16 07:14	17060-07-0	
Preservation pH	**1.0**		1.0	5		09/21/16 07:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**735**	mg/L	50.0	50		09/27/16 20:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Sample: TB-11102646-091216-CM-001 **Lab ID: 60227652005** Collected: 09/12/16 14:15 Received: 09/14/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	1.0	1		09/21/16 07:29	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		09/21/16 07:29	100-41-4	
Toluene	ND	ug/L	1.0	1		09/21/16 07:29	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		09/21/16 07:29	1330-20-7	
Surrogates								
Toluene-d8 (S)	99	%	80-120	1		09/21/16 07:29	2037-26-5	
4-Bromofluorobenzene (S)	105	%	77-130	1		09/21/16 07:29	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		09/21/16 07:29	17060-07-0	
Preservation pH	**1.0**		1.0	1		09/21/16 07:29		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60227652

QC Batch: 447446 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60227652001, 60227652002, 60227652003, 60227652004

METHOD BLANK: 1830368 Matrix: Water
Associated Lab Samples: 60227652001, 60227652002, 60227652003, 60227652004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	09/22/16 15:26	

LABORATORY CONTROL SAMPLE: 1830369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	1000	996	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1830370 1830371

Parameter	Units	60227652001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	925	1000	1000	1880	1890	96	96	75-125	0	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60227652

QC Batch: 447129 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60227652002, 60227652003, 60227652004, 60227652005

METHOD BLANK: 1828945 Matrix: Water
Associated Lab Samples: 60227652002, 60227652003, 60227652004, 60227652005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	09/21/16 06:00	
Ethylbenzene	ug/L	ND	1.0	09/21/16 06:00	
Toluene	ug/L	ND	1.0	09/21/16 06:00	
Xylene (Total)	ug/L	ND	3.0	09/21/16 06:00	
1,2-Dichloroethane-d4 (S)	%	98	81-127	09/21/16 06:00	
4-Bromofluorobenzene (S)	%	106	77-130	09/21/16 06:00	
Toluene-d8 (S)	%	99	80-120	09/21/16 06:00	

LABORATORY CONTROL SAMPLE: 1828946

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	20.5	103	79-116	
Ethylbenzene	ug/L	20	19.5	97	81-110	
Toluene	ug/L	20	19.3	96	82-111	
Xylene (Total)	ug/L	60	57.9	97	80-111	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			102	77-130	
Toluene-d8 (S)	%			99	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60227652

QC Batch: 447787
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60227652001

METHOD BLANK: 1831824
Matrix: Water
Associated Lab Samples: 60227652001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	09/23/16 18:53	
Ethylbenzene	ug/L	ND	1.0	09/23/16 18:53	
Toluene	ug/L	ND	1.0	09/23/16 18:53	
Xylene (Total)	ug/L	ND	3.0	09/23/16 18:53	
1,2-Dichloroethane-d4 (S)	%	98	81-127	09/23/16 18:53	
4-Bromofluorobenzene (S)	%	102	77-130	09/23/16 18:53	
Toluene-d8 (S)	%	99	80-120	09/23/16 18:53	

LABORATORY CONTROL SAMPLE: 1831825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.0	95	79-116	
Ethylbenzene	ug/L	20	19.0	95	81-110	
Toluene	ug/L	20	19.2	96	82-111	
Xylene (Total)	ug/L	60	58.5	97	80-111	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			101	77-130	
Toluene-d8 (S)	%			101	80-120	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60227652

QC Batch: 448121 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60227652001, 60227652002, 60227652003, 60227652004

METHOD BLANK: 1833255 Matrix: Water
Associated Lab Samples: 60227652001, 60227652002, 60227652003, 60227652004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	09/27/16 14:46	

LABORATORY CONTROL SAMPLE: 1833256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE SAMPLE: 1833259

Parameter	Units	60227617002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	43.0	25	68.7	103	80-120	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: 11102646 Magnum No1
Pace Project No.: 60227652

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 447129

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 447787

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11102646 Magnum No1
Pace Project No.: 60227652

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227652001	**GW-11102646-091216-CM-MW-1**	EPA 3010	447446	EPA 6010	447531
60227652002	**GW-11102646-091216-CM-MW-2**	EPA 3010	447446	EPA 6010	447531
60227652003	**GW-11102646-091216-CM-MW-3**	EPA 3010	447446	EPA 6010	447531
60227652004	**GW-11102646-091216-CM-MW-4**	EPA 3010	447446	EPA 6010	447531
60227652001	**GW-11102646-091216-CM-MW-1**	EPA 8260	447787		
60227652002	**GW-11102646-091216-CM-MW-2**	EPA 8260	447129		
60227652003	**GW-11102646-091216-CM-MW-3**	EPA 8260	447129		
60227652004	**GW-11102646-091216-CM-MW-4**	EPA 8260	447129		
60227652005	**TB-11102646-091216-CM-001**	EPA 8260	447129		
60227652001	**GW-11102646-091216-CM-MW-1**	EPA 300.0	448121		
60227652002	**GW-11102646-091216-CM-MW-2**	EPA 300.0	448121		
60227652003	**GW-11102646-091216-CM-MW-3**	EPA 300.0	448121		
60227652004	**GW-11102646-091216-CM-MW-4**	EPA 300.0	448121		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60227652

60227652

Client Name: COP GHD NM

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 8105 9238 1723 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☒ Bubble Bags ☒ Foam ☐ None ☐ Other ☐

Thermometer Used: CF +1.1 T-266 / CF -0.1 T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.6 **Corr. Factor** CF +1.1 CF -0.1 **Corrected** 1.7

Date and initials of person examining contents: 9/14/16 1430

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: wtr	☑Yes ☐No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☑ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☑No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: alice Date: 09/15/16

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1425	Start:
End: 1430	End:
Temp:	Temp:

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 1

Section A
Required Client Information:

Company:	GHD Services_COP NM
Address:	6121 Indian School Rd NE
	Albuquerque, NM 87110
Email:	jeff.walker@ghd.com
Phone:	505-377-3920
Fax:	
Requested Due Date:	

Section B
Required Project Information:

Report To:	Jeffrey Walker
Copy To:	
Purchase Order #:	
Project Name:	11102646 Magnum No1
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	alice.flanagan@pacelabs.com,
Pace Profile #:	8644,24

Regulatory Agency	
State / Location	NM

MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

SAMPLE ID: One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

Requested Analysis Filtered (Y/N)

6-227652

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260 BTEX	Sulfate by 300.0	Dissolved Mn-field filtered	Residual Chlorine (Y/N)		
1	GW-11102646-091216-CM-MW-1	WT	G	9/12/16	1430				5	1		1	3						X	X	X		1([illegible]) 1([illegible]) 3(BTEX)	001
2	GW-11102646-091216-CM-MW-2	WT	G	9/12/16	1445				5	1		1	3						X	X	X		↓	002
3	GW-11102646-091216-CM-MW-3	WT	G	9/12/16	1500				5	1		1	3						X	X	X		↓	003
4	GW-11102646-091216-CM-MW-4	WT	G	9/12/16	1510				5	1		1	3						X	X	X		↓	004
5	TB-11102646-091316-CM-001	WT		9/13/16	1415				2				2						X				2(BTEX)	005
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / GHD	9/13/16	1430	[signature] / Pace	9/14/16	850	1.7	Y	Y	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Christine Mathews

SIGNATURE of SAMPLER: [signature] DATE Signed: 9/13/16

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 19, 2016

Jeffrey Walker
GHD Services, Inc
6121 Indian School Rd NE
Ste 200
Albuquerque, NM 87110

RE: Project: 11102646 Magnum No1
Pace Project No.: 60233340

Dear Jeffrey Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on December 01, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Alice Spiller

Alice Spiller
alice.spiller@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60233340001	**GW-11102646-112916-CN-MW1**	Water	11/29/16 13:00	12/01/16 08:55
60233340002	**GW-11102646-112916-CN-MW2**	Water	11/29/16 12:30	12/01/16 08:55
60233340003	**GW-11102646-112916-CN-MW3**	Water	11/29/16 12:45	12/01/16 08:55
60233340004	**GW-11102646-112916-CN-MW4**	Water	11/29/16 12:55	12/01/16 08:55
60233340005	**TRIP BLANK**	Water	11/29/16 12:30	12/01/16 08:55

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SAMPLE ANALYTE COUNT

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60233340001	**GW-11102646-112916-CN-MW1**	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340002	**GW-11102646-112916-CN-MW2**	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340003	**GW-11102646-112916-CN-MW3**	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340004	**GW-11102646-112916-CN-MW4**	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340005	**TRIP BLANK**	EPA 8260	EAG	8

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PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: December 19, 2016

General Information:
4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

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

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

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

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

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

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Method: **EPA 8260**
Description: 8260 MSV UST, Water
Client: GHD Services_COP NM
Date: December 19, 2016

General Information:
5 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

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

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

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

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

QC Batch: 458375

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: December 19, 2016

General Information:
4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

Additional Comments:

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

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Sample: GW-11102646-112916-CN-MW1 **Lab ID: 60233340001** Collected: 11/29/16 13:00 Received: 12/01/16 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**990**	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:17	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**13.2**	ug/L	5.0	5		12/10/16 05:26	71-43-2	
Ethylbenzene	**119**	ug/L	5.0	5		12/10/16 05:26	100-41-4	
Toluene	ND	ug/L	5.0	5		12/10/16 05:26	108-88-3	
Xylene (Total)	**445**	ug/L	15.0	5		12/10/16 05:26	1330-20-7	
Surrogates								
Toluene-d8 (S)	104	%	80-120	5		12/10/16 05:26	2037-26-5	
4-Bromofluorobenzene (S)	98	%	77-130	5		12/10/16 05:26	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	81-127	5		12/10/16 05:26	17060-07-0	
Preservation pH	**1.0**		1.0	5		12/10/16 05:26		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**240**	mg/L	20.0	20		12/17/16 17:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Sample: GW-11102646-112916-CN-MW2 **Lab ID: 60233340002** Collected: 11/29/16 12:30 Received: 12/01/16 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1410**	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:21	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**25.7**	ug/L	1.0	1		12/10/16 05:40	71-43-2	
Ethylbenzene	**2.1**	ug/L	1.0	1		12/10/16 05:40	100-41-4	
Toluene	ND	ug/L	1.0	1		12/10/16 05:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		12/10/16 05:40	1330-20-7	
Surrogates								
Toluene-d8 (S)	102	%	80-120	1		12/10/16 05:40	2037-26-5	
4-Bromofluorobenzene (S)	97	%	77-130	1		12/10/16 05:40	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		12/10/16 05:40	17060-07-0	
Preservation pH	**1.0**		1.0	1		12/10/16 05:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**2.6**	mg/L	1.0	1		12/17/16 17:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Sample: GW-11102646-112916-CN-MW3 **Lab ID: 60233340003** Collected: 11/29/16 12:45 Received: 12/01/16 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**3120**	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:25	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**2970**	ug/L	20.0	20		12/10/16 05:54	71-43-2	
Ethylbenzene	**845**	ug/L	20.0	20		12/10/16 05:54	100-41-4	
Toluene	ND	ug/L	20.0	20		12/10/16 05:54	108-88-3	
Xylene (Total)	**5440**	ug/L	60.0	20		12/10/16 05:54	1330-20-7	
Surrogates								
Toluene-d8 (S)	101	%	80-120	20		12/10/16 05:54	2037-26-5	
4-Bromofluorobenzene (S)	95	%	77-130	20		12/10/16 05:54	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	20		12/10/16 05:54	17060-07-0	
Preservation pH	**1.0**		1.0	20		12/10/16 05:54		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**22.5**	mg/L	2.0	2		12/17/16 18:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Sample: GW-11102646-112916-CN-MW4 **Lab ID: 60233340004** Collected: 11/29/16 12:55 Received: 12/01/16 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese, Dissolved	**1260**	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:29	7439-96-5	
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	**85.3**	ug/L	5.0	5		12/10/16 06:08	71-43-2	
Ethylbenzene	**92.9**	ug/L	5.0	5		12/10/16 06:08	100-41-4	
Toluene	ND	ug/L	5.0	5		12/10/16 06:08	108-88-3	
Xylene (Total)	**967**	ug/L	15.0	5		12/10/16 06:08	1330-20-7	
Surrogates								
Toluene-d8 (S)	105	%	80-120	5		12/10/16 06:08	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	5		12/10/16 06:08	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	5		12/10/16 06:08	17060-07-0	
Preservation pH	**1.0**		1.0	5		12/10/16 06:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**382**	mg/L	50.0	50		12/17/16 18:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Sample: TRIP BLANK **Lab ID: 60233340005** Collected: 11/29/16 12:30 Received: 12/01/16 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	1.0	1		12/10/16 06:22	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		12/10/16 06:22	100-41-4	
Toluene	ND	ug/L	1.0	1		12/10/16 06:22	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		12/10/16 06:22	1330-20-7	
Surrogates								
Toluene-d8 (S)	101	%	80-120	1		12/10/16 06:22	2037-26-5	
4-Bromofluorobenzene (S)	96	%	77-130	1		12/10/16 06:22	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		12/10/16 06:22	17060-07-0	
Preservation pH	**1.0**		1.0	1		12/10/16 06:22		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60233340

QC Batch: 457310 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004

METHOD BLANK: 1872141 Matrix: Water
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	12/05/16 16:34	

LABORATORY CONTROL SAMPLE: 1872142

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1872143 1872144

Parameter	Units	60232824001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	0.38 mg/L	1000	1000	1400	1390	101	101	75-125	1	20	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60233340

QC Batch: 458375 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004, 60233340005

METHOD BLANK: 1876626 Matrix: Water
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004, 60233340005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	12/10/16 02:53	
Ethylbenzene	ug/L	ND	1.0	12/10/16 02:53	
Toluene	ug/L	ND	1.0	12/10/16 02:53	
Xylene (Total)	ug/L	ND	3.0	12/10/16 02:53	
1,2-Dichloroethane-d4 (S)	%	98	81-127	12/10/16 02:53	
4-Bromofluorobenzene (S)	%	96	77-130	12/10/16 02:53	
Toluene-d8 (S)	%	102	80-120	12/10/16 02:53	

LABORATORY CONTROL SAMPLE: 1876627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	18.4	92	79-116	
Ethylbenzene	ug/L	20	19.3	97	81-110	
Toluene	ug/L	20	18.6	93	82-111	
Xylene (Total)	ug/L	60	58.6	98	80-111	
1,2-Dichloroethane-d4 (S)	%			96	81-127	
4-Bromofluorobenzene (S)	%			94	77-130	
Toluene-d8 (S)	%			103	80-120	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: 11102646 Magnum No1
Pace Project No.: 60233340

QC Batch: 458963 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004

METHOD BLANK: 1878843 Matrix: Water
Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	12/17/16 09:14	

LABORATORY CONTROL SAMPLE: 1878844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1878845 1878846

Parameter	Units	60233523001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	1450	500	500	1990	1980	108	107	80-120	0	15	

MATRIX SPIKE SAMPLE: 1878847

Parameter	Units	60233523002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1290	500	1820	105	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 11102646 Magnum No1
Pace Project No.: 60233340

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 458375

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11102646 Magnum No1
Pace Project No.: 60233340

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60233340001	**GW-11102646-112916-CN-MW1**	EPA 3010	457310	EPA 6010	457385
60233340002	**GW-11102646-112916-CN-MW2**	EPA 3010	457310	EPA 6010	457385
60233340003	**GW-11102646-112916-CN-MW3**	EPA 3010	457310	EPA 6010	457385
60233340004	**GW-11102646-112916-CN-MW4**	EPA 3010	457310	EPA 6010	457385
60233340001	**GW-11102646-112916-CN-MW1**	EPA 8260	458375		
60233340002	**GW-11102646-112916-CN-MW2**	EPA 8260	458375		
60233340003	**GW-11102646-112916-CN-MW3**	EPA 8260	458375		
60233340004	**GW-11102646-112916-CN-MW4**	EPA 8260	458375		
60233340005	**TRIP BLANK**	EPA 8260	458375		
60233340001	**GW-11102646-112916-CN-MW1**	EPA 300.0	458963		
60233340002	**GW-11102646-112916-CN-MW2**	EPA 300.0	458963		
60233340003	**GW-11102646-112916-CN-MW3**	EPA 300.0	458963		
60233340004	**GW-11102646-112916-CN-MW4**	EPA 300.0	458963		

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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60233340

60233340

Client Name: GHD Cor NM

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7044 6656 7687 Pace Shipping Label Used? Yes ☒ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☑ Bubble Bags ☑ Foam ☐ None ☐ Other ☐

Thermometer Used: CF +0.7 / CF -0.5 T-266 / T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 0.6 **Corr. Factor** CF +0.7 CF -0.5 **Corrected** 1.5

Date and initials of person examining contents: 11/25 JM 12/1/16

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☑Yes ☐No ☐N/A	Unpreserved filtered container provided for Dissolved Mn
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: water	☐Yes ☐No ☑N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☑N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☑Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☑No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Alice Date: 12/01/16

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1120	Start:
End: 1125	End:
Temp:	Temp:

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GHD Services_COP NM	Report To:	Jeffrey Walker	Attention:	
Address:	6121 Indian School Rd NE	Copy To:		Company Name:	
Albuquerque, NM 87110				Address:	
Email:	jeff.walker@ghd.com	Purchase Order #:	34008245	Pace Quote:	
Phone:	505-377-3920 Fax:	Project Name:	11102646 Magnum No1	Pace Project Manager:	alice.spiller@pacelabs.com.
Requested Due Date:		Project #:	11102646	Pace Profile #:	8644,24

Regulatory Agency	
State / Location	NM

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: 8260 BTEX	Sulfate by 300.0	Dissolved Mn-field filtered	Residual Chlorine (Y/N)	60233340
1	GW-11102646-112916-CN-MW1	GW	G	112916	1300			A	5	X			X						X	X	X		3(DISH) 2(BTEX) 001
2	GW-11102646-112916-CN-MW2				1230														X	X	X		002
3	GW-11102646-112916-CN-MW3				1245														X	X	X		003
4	GW-11102646-112916-CN-MW4				1255														X	X	X		004
5																							2(DISH) TB 005
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	J Walker / GHD	113016	1343	[signature] / Pace	12/1/16	855	1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: J Walker for CA

SIGNATURE of SAMPLER: [signature] DATE Signed: 11/30/16