

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

FORM APPROVED

OMB NO 1004-0137

Expires July 31, 2010

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5 LEASE DESIGNATION AND SERIAL NO

NMNM59383

6 INDIAN ALLOTTEE OR TRIBE NAME

7 UNIT AGREEMENT

NM127243

8 FARM OR LEASE NAME

Road Lizard 5 Federal Com #2H

9 API WELL NO

30-015-39283

10 FIELD NAME

Culebra Bluff, Bone Spring, South

11 SEC T. R. M. OR BLOCK AND SURVEY
OR AREA 5 T 23S R 29E

12 COUNTY OR PARISH 13 STATE

Eddy

NM

17 ELEVATIONS (DF, RKB, RT, GR, etc)*

3014'

GR

KB

20 Depth Bridge Plug Set
MD
TVD22 Was well cored? ☒ No ☐ Yes (Submit analysis)Was DST run? ☒ No ☐ Yes (Submit report)Directional Survey? ☐ No ☒ Yes (Submit copy)

23 Casing and Liner Record (Report all strings set in well)

Hole Size	Size/ Grade	Wt (#/ft)	Top (MD)	Bottom(MD)	Stage Cementer Depth	No of Sks & Type of Cement	Slurry Vol (Bbl)	Cement Top*	Amount Pulled
17 1/2"	13 3/8" H40	54#	0	265'		400 sx		0	None
12 1/4"	9 5/8" J55	36#	0	2975'		1000 sx		0	None
7 7/8"	7" P110	26#	0	8919'					
7 7/8"	5 1/2" P110	17#	8920'	16805'	2445'	2700 sx		0	None

24 Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)

25 Producing Intervals

Formation	Top	Bottom	26 Perforation Record	Size	No of Holes	Perf Status
A) Bone Spring	8940'	16755'	8940-16755'	0.43"	796	Open
B)						
C)						
D)						

27 Acid, Fracture Treatment, Cement Squeeze, Etc

Depth Interval	Amount and Type of Material
8940-16755'	Acidz w/70056 gal 7 1/2% acid; Frac w/11920158# sand & 4742580 gal fluid

Accepted for record

NMOC

RECLAMATION
DUE 6-20-12

28 Production- Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr API	Gas Gravity	Production Method
12/29/11	1/3/12	24	→	402	860	2516			Flowing
Choke Size	Tbg Press Flwg	Csg Press	24 Hr Rate	Oil Bbl	Gas MCF	Water Bbl	Gas Oil Ratio	Well Status	
36/64"	500#		→	402	860	2516			Producing

28a Production- Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil Bbl	Gas MCF	Water Bbl	Gas Oil Ratio	Well Status	
			→						

BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

28b Production- Interval C

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil Bbl	Gas MCF	Water Bbl	Gas Oil Ratio	Well Status	
			→						

28c Production- Interval D

Date First Produced	Test Date	Hours Tested	Test Production	Oil Bbl	Gas MCF	Water Bbl	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil Bbl	Gas MCF	Water Bbl	Gas Oil Ratio	Well Status	
			→						

29 Disposition of Gas (Sold, used for fuel, vented, etc)

Sold

30 Summary of Porous Zones (include Aquifers)

Show all important zones of porosity and contents thereof Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries

31 Formation (Log) Markers

Formation	Top	Bottom	Descriptions Contents, Etc	Name	Top
					Measured Depth
Delaware Bone Spring	2915'	6551'		Top of Salt	315'
	6552'	16805'		Bottom of Salt	2686'
				Delaware	2915'
				Bone Spring	6552'
					TD 16805'

32 Additional remarks (include plugging procedure)

33 Indicate which items have been attached by placing a check in the appropriate boxes

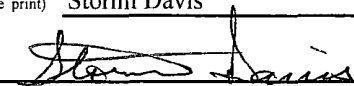
- ☒ Electrical/ Mechanical Logs (1 full set required)
 ☐ Geologic Report
 ☐ DST Report
 ☒ Directional Survey
- ☐ Sundry Notice for plugging and cement verification
 ☐ Core Analysis
 ☒ Other Deviation Report

34 I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

Name (please print) Stormi Davis

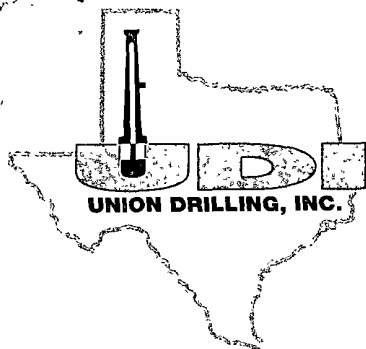
Title Regulatory Analyst

Signature



Date 1/4/12

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction



Well Name & Number: Road Lizard 5 Federal Com #2H

API Number: 30-015-39283

Location: 1,715' FNL & 2,220' FEL, Lot G, Sec. 5, Township 23S, Range 29E,
Eddy County, New Mexico

Operator: COG Operating, LLC

Drilling Contractor: Union Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling Contractor who drilled the above described well and that deviation survey tests were conducted and he obtained the following results:

RECORD OF INCLINATION

*11 Measured Depth (feet)	12 Course Length (Hundreds of feet)	*13 Angle of Inclination (Degrees)	14 Displacement per Hundred Feet (Sine of Angle X100)	15 Course Displacement (feet)	16 Accumulative Displacement (feet)
614	614	.5	0.87	5.36	5.36
1524	910	1	1.75	15.88	21.24
2424	900	1.62	2.83	25.45	46.69
3110	686	.25	0.44	2.99	49.68
3837	727	.5	0.87	6.34	56.02
4532	695	.5	0.87	6.06	62.09
5226	694	.75	1.31	9.08	71.17
5890	664	.25	0.44	2.90	74.07
6615	6615	1	1.75	115.45	189.52
7564	949	2.73	4.76	45.21	234.74
8069	505	2.04	3.56	17.98	252.72
DIRECTIONAL					
TOOK OVER					

Drilling Contractor: Union Drilling, Inc.

By: Jim Mayfield
Jim Mayfield

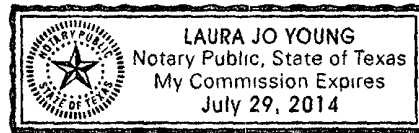
Title: Division Manager

Subscribed and sworn to before me this 25th Day of October, 2011.

Laura Jo Young
Notary Public

My Commission Expires: July 29, 2014

COUNTY OF TAYLOR)
)
STATE OF TEXAS)



30-015-39283

COG OPERATING

Culebra Bluff
Eddy County, NM
Road Lizard 5 Federal Com #2H
VH - Job #32K0911920

Survey: Actual

SDI Standard Survey Report

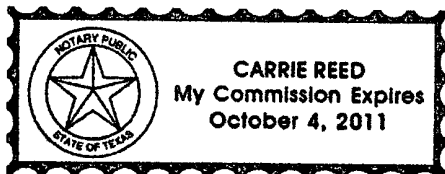
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 4th of October, 2011.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling
Directional Drilling Operations

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Road Lizard 5 Federal Com #2H
Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Road Lizard 5 Federal Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0911920	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911920	Database:	EDM-Regulatory

Project:	Culebra Bluff		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site: Eddy County, NM					
Site Position:		Northing:	486,485 38 usft	Latitude:	32° 20' 13 338 N
From:	Lat/Long	Easting:	601,240 90 usft	Longitude:	104° 0' 19 945 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 18 °

Well	Road Lizard 5 Federal Com #2H, Directional (DDC)					
Well Position	+N/-S	0 0 usft	Northing:	486,485 38 usft	Latitude:	32° 20' 13 338 N
	+E/-W	0 0 usft	Easting:	601,240 90 usft	Longitude:	104° 0' 19 945 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0911920				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/27/2011	7 76	60 21	48,633

Design:	VH - Job #32K0911920				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0 0	0 0	0 0	178 00	

Survey Program		Date	10/23/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 0	8,117 0	Actual (VH - Job #32K0911920)	Keeper	Keeper Gyro	

Survey:								
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance	
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)	
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0	
100 0	0 24	196 13	100 0	-0 2	-0 1	196 13	0 2	
200 0	0 43	231 15	200 0	-0 6	-0 4	212 65	0 8	
300 0	0 53	158 91	300 0	-1 3	-0 5	202 27	1 4	
400 0	0 61	168 16	400 0	-2 3	-0 3	186 54	2 3	
500 0	0 62	179 94	500 0	-3 3	-0 1	182 57	3 3	
600 0	0 76	186 04	600 0	-4 5	-0 2	182 76	4 5	
700 0	0 72	164 29	700 0	-5 8	-0 1	181 17	5 8	
800 0	0 71	195 16	800 0	-7 0	-0 1	180 90	7 0	
900 0	0 87	194 49	900 0	-8 3	-0 5	183 18	8 3	
1,000 0	1 22	219 29	999 9	-9 9	-1 3	187 64	10 0	
1,100 0	1 41	229 13	1,099 9	-11 5	-2 9	194 29	11 9	

Scientific Drilling International, Inc.
SDI Standard Survey Report



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Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Road Lizard 5 Federal Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0911920	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911920	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,200.0	1.39	228.74	1,199.9	-13.1	-4.8	200.00	14.0	
1,300.0	1.46	237.17	1,299.8	-14.6	-6.8	204.82	16.1	
1,400.0	1.24	239.14	1,399.8	-15.8	-8.8	208.91	18.1	
1,500.0	0.90	238.67	1,499.8	-16.8	-10.4	211.63	19.7	
1,600.0	0.97	223.56	1,599.8	-17.8	-11.6	213.06	21.3	
1,700.0	1.16	225.18	1,699.8	-19.2	-12.9	213.97	23.1	
1,800.0	0.95	230.02	1,799.8	-20.4	-14.3	214.95	24.9	
1,900.0	0.56	244.82	1,899.7	-21.1	-15.3	215.96	26.1	
2,000.0	0.47	237.65	1,999.7	-21.6	-16.1	216.78	26.9	
2,100.0	0.69	164.66	2,099.7	-22.4	-16.3	216.10	27.7	
2,200.0	1.29	147.37	2,199.7	-23.9	-15.5	213.04	28.5	
2,300.0	1.34	149.53	2,299.7	-25.9	-14.3	209.03	29.6	
2,400.0	1.96	144.76	2,399.7	-28.3	-12.8	204.31	31.0	
2,500.0	2.78	144.68	2,499.6	-31.6	-10.4	198.16	33.3	
2,600.0	2.10	144.20	2,599.5	-35.1	-7.9	192.69	36.0	
2,700.0	1.61	133.19	2,699.4	-37.6	-5.8	188.80	38.0	
2,800.0	0.90	132.58	2,799.4	-39.0	-4.2	186.15	39.3	
2,900.0	0.81	125.09	2,899.4	-40.0	-3.1	184.37	40.1	
3,000.0	0.61	137.57	2,999.4	-40.8	-2.1	182.97	40.8	
3,100.0	0.83	148.88	3,099.4	-41.8	-1.4	181.89	41.8	
3,200.0	0.45	152.87	3,199.4	-42.8	-0.8	181.11	42.8	
3,300.0	0.44	135.49	3,299.4	-43.4	-0.4	180.50	43.4	
3,400.0	0.41	116.87	3,399.4	-43.8	0.2	179.73	43.8	
3,500.0	0.46	167.62	3,499.4	-44.4	0.6	179.21	44.4	
3,600.0	0.30	136.42	3,599.4	-45.0	0.9	178.88	45.0	
3,700.0	0.48	132.21	3,699.4	-45.4	1.4	178.27	45.5	
3,800.0	0.32	115.17	3,799.4	-45.8	1.9	177.58	45.9	
3,900.0	0.35	88.88	3,899.4	-45.9	2.5	176.89	46.0	
4,000.0	0.44	115.57	3,999.3	-46.1	3.1	176.10	46.2	
4,100.0	0.32	114.08	4,099.3	-46.4	3.7	175.38	46.5	
4,200.0	0.33	135.12	4,199.3	-46.7	4.2	174.86	46.9	
4,300.0	0.34	177.08	4,299.3	-47.2	4.4	174.65	47.4	
4,400.0	0.25	121.84	4,399.3	-47.6	4.6	174.45	47.8	
4,500.0	0.46	168.34	4,499.3	-48.1	4.9	174.20	48.4	
4,600.0	0.29	193.71	4,599.3	-48.8	4.9	174.25	49.0	
4,700.0	0.46	158.94	4,699.3	-49.4	5.0	174.22	49.6	
4,800.0	0.45	196.68	4,799.3	-50.1	5.0	174.28	50.4	
4,900.0	0.51	165.97	4,899.3	-50.9	5.0	174.37	51.2	
5,000.0	0.77	183.48	4,999.3	-52.0	5.1	174.42	52.3	
5,100.0	0.84	164.08	5,099.3	-53.4	5.2	174.39	53.7	
5,200.0	0.43	180.56	5,199.3	-54.5	5.4	174.29	54.8	
5,300.0	0.57	168.53	5,299.3	-55.4	5.5	174.28	55.6	
5,400.0	0.43	174.66	5,399.3	-56.2	5.7	174.24	56.5	
5,500.0	0.62	180.85	5,499.3	-57.1	5.7	174.30	57.4	

Scientific Drilling International, Inc.
SDI Standard Survey Report

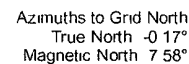


Company:	COG OPERATING	Local Co-ordinate Reference:	Well Road Lizard 5 Federal Com #2H
Project:	Culebra Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Road Lizard 5 Federal Com #2H	North Reference:	Grid
Wellbore:	VH - Job #32K0911920	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911920	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.0	0.42	192.81	5,599.3	-58.0	5.6	174.48	58.3
5,700.0	0.70	191.77	5,699.3	-59.0	5.4	174.76	59.2
5,800.0	0.60	187.88	5,799.3	-60.1	5.2	175.05	60.3
5,900.0	0.56	210.82	5,899.3	-61.0	4.9	175.42	61.2
6,000.0	0.89	188.97	5,999.3	-62.2	4.5	175.85	62.4
6,100.0	0.72	197.97	6,099.3	-63.6	4.2	176.22	63.7
6,200.0	0.78	205.55	6,199.2	-64.8	3.7	176.72	64.9
6,300.0	0.69	196.61	6,299.2	-66.0	3.2	177.18	66.1
6,400.0	1.16	206.13	6,399.2	-67.5	2.6	177.77	67.5
6,500.0	0.97	210.22	6,499.2	-69.1	1.8	178.54	69.1
6,600.0	1.16	213.22	6,599.2	-70.7	0.8	179.37	70.7
6,700.0	1.44	247.31	6,699.2	-72.0	-0.9	180.74	72.0
6,800.0	1.90	248.18	6,799.1	-73.1	-3.6	182.84	73.2
6,900.0	2.44	255.91	6,899.1	-74.3	-7.2	185.57	74.6
7,000.0	3.08	270.17	6,998.9	-74.8	-12.0	189.11	75.7
7,100.0	3.42	275.43	7,098.8	-74.5	-17.6	193.33	76.6
7,200.0	3.32	281.19	7,198.6	-73.6	-23.5	197.67	77.3
7,300.0	2.90	289.10	7,298.5	-72.3	-28.7	201.65	77.7
7,400.0	2.62	281.72	7,398.3	-71.0	-33.3	205.15	78.4
7,500.0	2.74	273.06	7,498.2	-70.4	-37.9	208.33	79.9
7,600.0	2.89	274.78	7,598.1	-70.0	-42.8	211.45	82.1
7,700.0	2.59	271.85	7,698.0	-69.8	-47.6	214.32	84.4
7,800.0	2.30	270.82	7,797.9	-69.6	-51.9	216.68	86.8
7,900.0	2.04	260.18	7,897.8	-69.9	-55.6	218.51	89.4
8,000.0	1.96	259.36	7,997.8	-70.5	-59.1	219.94	92.0
8,100.0	1.82	257.87	8,097.7	-71.2	-62.3	221.19	94.6
8,117.0	1.80	252.04	8,114.7	-71.3	-62.8	221.37	95.0



Project: Culebra Bluff
Eddy County, NM
Well: Road Lizard 5 Federal Com #2H
Vellbore VH - Job #32K0911920
Design: VH - Job #32K0911920



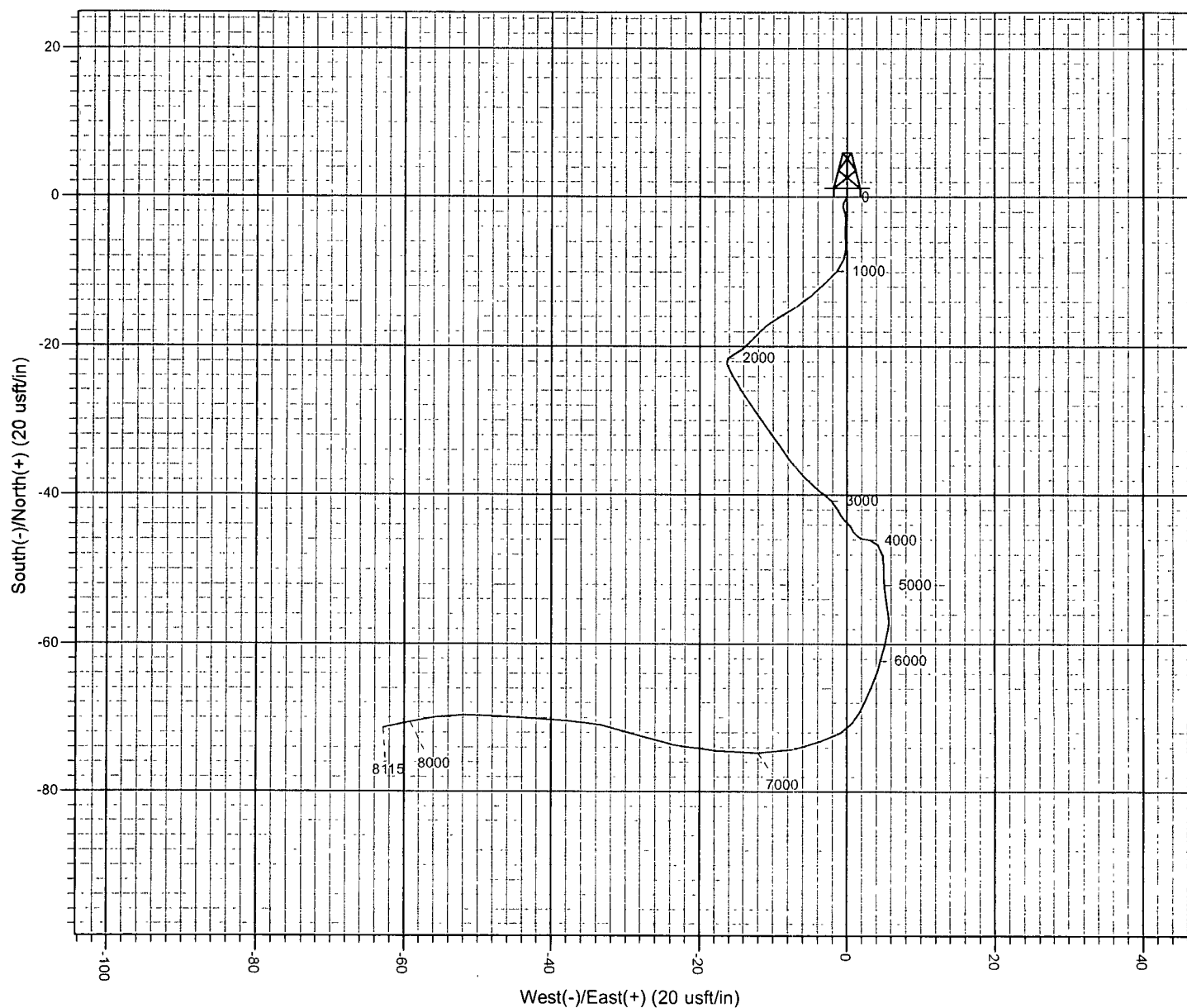
Magnetic Field
Strength 48633 3snT
Dip Angle 60 21°
Date 9/27/2011
Model IGRF2010

WELL DETAILS: Road Lizard 5 Federal Com #2H
WELL @ 0.0usft (Original Well Elev)

Ground Level.	0.0
---------------	-----

Ground Level.	0.0
---------------	-----

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	486485.38	601240.90	32° 20' 13.338 N	104° 0' 19.945 W	



PROJECT DETAILS: Culebra Bluff
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 20' 13.338 N
Longitude: 104° 0' 19.945 W
Positional Uncertainty: 0.0
Convergence: 0.18
Local North: Grid

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC
 ROAD LIZARD 5 FED #2H
 CULEBRA BLUFF; BONE SPRING
 Rig:UDI 216
 PathFinder Office Supervisor: STEVE BIBB
 PathFinder Field Engineers: CHARLIE SANDIFER
 ZACH

Survey Horiz. Reference:WELLHEAD
 Ref Coordinates: LAT:32.20.13.3378 N LON:104.0.19.9449 W
 GRID Reference:NAD83 new mexico east Transverse Mercator
 Ref GRID Coord: X: 642576.2300 Y: 486501.4700
 North Aligned To:TRUE NORTH
 Total Magnetic Correction: 7.58°EAST TO TRUE
 Vertical Section Plane: 178.00
 Survey Vert. Reference: 21.00' Kelly Bushing To Ground
 Altitude:3014.10' Ground To MSL

Survey Calculations by RX5 V6.03E using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
8117.00	1.80	252.04	8114.71	8093.71	69.12	71.36 S	62.81 W	95.06@	221.35	0.00	0.00
TIED INTO DDC MWD SURVEYS @ 8143' MD.											
8143.00	1.90	252.60	8140.70	8119.70	69.35	71.61 S	63.61 W	95.79@	221.61	0.39	0.00
8175.00	3.00	224.90	8172.67	8151.67	70.06	72.37 S	64.71 W	97.08@	221.80	4.96	0.00
8206.00	6.60	195.80	8203.56	8182.56	72.32	74.66 S	65.77 W	99.49@	221.38	13.67	0.00
8237.00	11.30	186.40	8234.17	8213.17	77.02	79.39 S	66.59 W	103.62@	219.99	15.83	0.00
8269.00	15.80	179.50	8265.28	8244.28	84.48	86.87 S	66.90 W	109.64@	217.60	14.92	0.00
8300.00	20.30	178.90	8294.74	8273.74	94.08	96.47 S	66.76 W	117.32@	214.68	14.53	0.00
8331.00	23.90	179.50	8323.46	8302.46	105.74	108.13 S	66.60 W	127.00@	211.63	11.64	0.00
8363.00	27.40	178.30	8352.30	8331.30	119.59	121.98 S	66.33 W	138.84@	208.54	11.06	0.00
8394.00	31.10	176.40	8379.35	8358.35	134.73	137.10 S	65.61 W	151.99@	205.57	12.30	0.00
8425.00	35.00	175.10	8405.33	8384.33	151.62	153.96 S	64.35 W	166.86@	202.68	12.79	0.00
8457.00	38.30	175.70	8431.00	8410.00	170.70	172.99 S	62.82 W	184.05@	199.96	10.37	0.00
8488.00	40.70	176.90	8454.92	8433.92	190.40	192.67 S	61.56 W	202.26@	197.72	8.12	0.00
8519.00	43.30	178.00	8477.95	8456.95	211.14	213.39 S	60.64 W	221.84@	195.86	8.72	0.00
8550.00	46.40	178.70	8499.93	8478.93	233.00	235.24 S	60.01 W	242.78@	194.31	10.13	0.00
8582.00	50.20	178.70	8521.21	8500.21	256.89	259.12 S	59.47 W	265.86@	192.93	11.88	0.00
8613.00	53.80	178.10	8540.29	8519.29	281.31	283.54 S	58.78 W	289.57@	191.71	11.71	0.00
8644.00	57.40	177.40	8557.80	8536.80	306.89	309.09 S	57.78 W	314.45@	190.59	11.76	0.00
8676.00	61.50	176.80	8574.07	8553.07	334.44	336.61 S	56.38 W	341.30@	189.51	12.91	0.00
8707.00	64.50	177.00	8588.14	8567.14	362.05	364.19 S	54.89 W	368.30@	188.57	9.69	0.00
8739.00	67.20	177.80	8601.23	8580.23	391.24	393.35 S	53.57 W	396.98@	187.75	8.74	0.00
8770.00	69.70	178.00	8612.61	8591.61	420.07	422.16 S	52.51 W	425.42@	187.09	8.09	0.00
8802.00	72.30	178.30	8623.03	8602.03	450.33	452.40 S	51.53 W	455.33@	186.50	8.17	0.00
8833.00	75.10	178.00	8631.73	8610.73	480.08	482.14 S	50.57 W	484.78@	185.99	9.08	0.00
8864.00	77.50	177.40	8639.07	8618.07	510.19	512.23 S	49.36 W	514.60@	185.50	7.97	0.00

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
8896.00	79.70	176.80	8645.40	8624.40	541.56	543.55 S	47.78 W	545.65@	185.02	7.12	0.00
8926.00	82.60	177.40	8650.01	8629.01	571.19	573.16 S	46.28 W	575.02@	184.62	9.87	0.00
8958.00	86.20	177.40	8653.13	8632.13	603.03	604.97 S	44.83 W	606.62@	184.24	11.25	0.00
9017.00	89.70	178.60	8655.25	8634.25	661.98	663.88 S	42.78 W	665.26@	183.69	6.27	0.00
9079.00	89.80	178.50	8655.52	8634.52	723.98	725.86 S	41.21 W	727.03@	183.25	0.23	0.00
9142.00	89.50	178.30	8655.90	8634.90	786.98	788.84 S	39.45 W	789.82@	182.86	0.57	0.00
9205.00	89.00	178.40	8656.73	8635.73	849.97	851.80 S	37.63 W	852.64@	182.53	0.81	0.00
9267.00	89.30	178.20	8657.64	8636.64	911.96	913.77 S	35.79 W	914.47@	182.24	0.58	0.00
9331.00	89.80	179.70	8658.15	8637.15	975.95	977.76 S	34.62 W	978.37@	182.03	2.47	0.00
9394.00	90.70	179.90	8657.87	8636.87	1038.92	1040.75 S	34.40 W	1041.32@	181.89	1.46	0.00
9457.00	90.60	178.40	8657.16	8636.16	1101.90	1103.74 S	33.47 W	1104.25@	181.74	2.39	0.00
9520.00	90.60	176.30	8656.50	8635.50	1164.89	1166.67 S	30.55 W	1167.07@	181.50	3.33	0.00
9583.00	89.40	176.20	8656.50	8635.50	1227.86	1229.53 S	26.43 W	1229.81@	181.23	1.91	0.00
9647.00	88.80	175.60	8657.50	8636.50	1291.81	1293.36 S	21.86 W	1293.54@	180.97	1.33	0.00
9710.00	88.70	176.50	8658.88	8637.88	1354.75	1356.19 S	17.52 W	1356.31@	180.74	1.44	0.00
9773.00	90.20	178.50	8659.48	8638.48	1417.74	1419.12 S	14.77 W	1419.20@	180.60	3.97	0.00
9836.00	90.60	178.20	8659.04	8638.04	1480.74	1482.10 S	12.96 W	1482.15@	180.50	0.79	0.00
9899.00	89.90	177.60	8658.77	8637.77	1543.74	1545.05 S	10.65 W	1545.09@	180.39	1.46	0.00
9962.00	89.40	177.20	8659.15	8638.15	1606.74	1607.99 S	7.79 W	1608.01@	180.28	1.02	0.00
10026.00	88.80	177.10	8660.16	8639.16	1670.72	1671.90 S	4.61 W	1671.91@	180.16	0.95	0.00
10089.00	88.30	177.40	8661.75	8640.75	1733.69	1734.81 S	1.59 W	1734.81@	180.05	0.93	0.00
10152.00	88.00	177.50	8663.79	8642.79	1796.66	1797.71 S	1.21 E	1797.71@	179.96	0.50	0.00
10215.00	88.80	177.70	8665.55	8644.55	1859.63	1860.63 S	3.85 E	1860.64@	179.88	1.31	0.00
10278.00	89.10	177.70	8666.70	8645.70	1922.62	1923.57 S	6.38 E	1923.58@	179.81	0.48	0.00
10341.00	89.40	177.00	8667.52	8646.52	1985.61	1986.50 S	9.29 E	1986.52@	179.73	1.21	0.00
10404.00	89.10	176.10	8668.35	8647.35	2048.58	2049.38 S	13.08 E	2049.42@	179.63	1.51	0.00
10436.00	88.70	175.50	8668.96	8647.96	2080.55	2081.28 S	15.42 E	2081.34@	179.58	2.25	0.00
10467.00	88.40	176.80	8669.75	8648.75	2111.53	2112.20 S	17.50 E	2112.28@	179.53	4.30	0.00

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
10499.00	88.50	178.10	8670.61	8649.61	2143.51	2144.16 S	18.93 E	2144.24@	179.49	4.07	0.00
10531.00	89.40	178.80	8671.20	8650.20	2175.51	2176.14 S	19.79 E	2176.23@	179.48	3.56	0.00
10562.00	90.10	178.40	8671.34	8650.34	2206.50	2207.13 S	20.55 E	2207.23@	179.47	2.60	0.00
10594.00	90.00	177.90	8671.31	8650.31	2238.50	2239.12 S	21.58 E	2239.22@	179.45	1.59	0.00
10657.00	90.60	177.70	8670.98	8649.98	2301.50	2302.07 S	24.00 E	2302.19@	179.40	1.00	0.00
10720.00	90.80	178.00	8670.21	8649.21	2364.50	2365.02 S	26.37 E	2365.17@	179.36	0.57	0.00
10783.00	89.80	177.30	8669.88	8648.88	2427.49	2427.96 S	28.95 E	2428.14@	179.32	1.94	0.00
10846.00	89.10	176.30	8670.48	8649.48	2490.48	2490.86 S	32.46 E	2491.07@	179.25	1.94	0.00
10910.00	90.60	177.60	8670.65	8649.65	2554.46	2554.77 S	35.87 E	2555.02@	179.20	3.10	0.00
10973.00	90.30	177.20	8670.16	8649.16	2617.46	2617.70 S	38.73 E	2617.99@	179.15	0.79	0.00
11036.00	89.60	176.30	8670.21	8649.21	2680.44	2680.60 S	42.30 E	2680.93@	179.10	1.81	0.00
11099.00	90.60	177.00	8670.10	8649.10	2743.42	2743.49 S	45.98 E	2743.87@	179.04	1.94	0.00
11162.00	90.60	178.40	8669.44	8648.44	2806.42	2806.43 S	48.51 E	2806.85@	179.01	2.22	0.00
11225.00	90.70	179.40	8668.73	8647.73	2869.40	2869.42 S	49.72 E	2869.85@	179.01	1.59	0.00
11288.00	91.20	178.70	8667.68	8646.68	2932.38	2932.40 S	50.76 E	2932.84@	179.01	1.37	0.00
11351.00	91.40	178.40	8666.25	8645.25	2995.36	2995.36 S	52.36 E	2995.82@	179.00	0.57	0.00
11415.00	89.70	176.90	8665.64	8644.64	3059.36	3059.30 S	54.98 E	3059.80@	178.97	3.54	0.00
11509.00	90.60	179.10	8665.39	8644.39	3153.35	3153.24 S	58.26 E	3153.77@	178.94	2.53	0.00
11572.00	90.90	179.80	8664.57	8643.57	3216.32	3216.23 S	58.87 E	3216.77@	178.95	1.21	0.00
11636.00	89.40	178.70	8664.40	8643.40	3280.31	3280.22 S	59.70 E	3280.76@	178.96	2.91	0.00
11699.00	88.50	177.20	8665.55	8644.55	3343.29	3343.17 S	61.96 E	3343.74@	178.94	2.78	0.00
11762.00	89.30	177.30	8666.76	8645.76	3406.27	3406.08 S	64.98 E	3406.70@	178.91	1.28	0.00
11825.00	90.50	178.10	8666.87	8645.87	3469.27	3469.03 S	67.51 E	3469.69@	178.89	2.29	0.00
11888.00	91.00	178.90	8666.05	8645.05	3532.26	3532.00 S	69.16 E	3532.68@	178.88	1.50	0.00
11952.00	90.80	178.40	8665.04	8644.04	3596.25	3595.98 S	70.66 E	3596.67@	178.87	0.84	0.00
12015.00	89.40	177.40	8664.93	8643.93	3659.25	3658.93 S	72.97 E	3659.66@	178.86	2.73	0.00
12078.00	89.00	176.90	8665.81	8644.81	3722.23	3721.85 S	76.10 E	3722.62@	178.83	1.02	0.00
12141.00	88.20	176.30	8667.35	8646.35	3785.20	3784.72 S	79.84 E	3785.56@	178.79	1.59	0.00

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THE FOLLOWING ARE PATHFINDER MWD SURVEYS											
12275.00	88.60	176.70	8671.09	8650.09	3919.10	3918.41 S	88.02 E	3919.40@	178.71	0.42	151.62
12306.00	89.50	177.30	8671.61	8650.61	3950.09	3949.37 S	89.64 E	3950.38@	178.70	3.49	155.24
12338.00	90.30	177.10	8671.66	8650.66	3982.09	3981.33 S	91.20 E	3982.37@	178.69	2.58	155.24
12369.00	89.90	176.80	8671.61	8650.61	4013.08	4012.28 S	92.85 E	4013.36@	178.67	1.61	155.24
12401.00	89.10	175.90	8671.89	8650.89	4045.06	4044.22 S	94.89 E	4045.33@	178.66	3.76	155.24
12432.00	88.80	176.40	8672.46	8651.46	4076.04	4075.14 S	96.97 E	4076.30@	178.64	1.88	155.24
12464.00	88.60	176.20	8673.18	8652.18	4108.02	4107.07 S	99.03 E	4108.26@	178.62	0.88	155.24
12496.00	90.40	176.80	8673.46	8652.46	4140.01	4139.00 S	100.99 E	4140.24@	178.60	5.93	155.24
12527.00	91.80	177.50	8672.87	8651.87	4171.00	4169.96 S	102.53 E	4171.22@	178.59	5.05	155.24
12559.00	91.80	177.20	8671.86	8650.86	4202.98	4201.91 S	104.01 E	4203.20@	178.58	0.94	155.24
12590.00	91.70	176.70	8670.91	8649.91	4233.96	4232.85 S	105.66 E	4234.17@	178.57	1.64	155.24
12622.00	91.50	176.60	8670.02	8649.02	4265.94	4264.78 S	107.52 E	4266.14@	178.56	0.70	155.24
12653.00	91.20	177.10	8669.29	8648.29	4296.92	4295.73 S	109.23 E	4297.12@	178.54	1.88	155.24
12685.00	91.20	176.80	8668.62	8647.62	4328.91	4327.68 S	110.93 E	4329.10@	178.53	0.94	155.24
12717.00	90.40	176.50	8668.17	8647.17	4360.90	4359.62 S	112.80 E	4361.08@	178.52	2.67	155.24
12748.00	90.40	176.40	8667.96	8646.96	4391.89	4390.56 S	114.72 E	4392.06@	178.50	0.32	155.24
12811.00	90.10	176.20	8667.68	8646.68	4454.86	4453.43 S	118.78 E	4455.01@	178.47	0.57	158.85
12875.00	90.40	176.90	8667.40	8646.40	4518.84	4517.31 S	122.64 E	4518.97@	178.44	1.19	158.85
12938.00	90.40	176.50	8666.96	8645.96	4581.82	4580.20 S	126.26 E	4581.94@	178.42	0.64	158.85
13001.00	90.30	176.20	8666.58	8645.58	4644.79	4643.07 S	130.27 E	4644.90@	178.39	0.50	158.85
13064.00	89.60	175.20	8666.63	8645.63	4707.74	4705.89 S	135.00 E	4707.83@	178.36	1.94	158.85
13127.00	89.80	175.60	8666.96	8645.96	4770.67	4768.69 S	140.05 E	4770.75@	178.32	0.71	155.24
13191.00	91.00	176.90	8666.52	8645.52	4834.64	4832.55 S	144.23 E	4834.70@	178.29	2.76	151.62
13254.00	90.70	177.00	8665.58	8644.58	4897.62	4895.45 S	147.59 E	4897.68@	178.27	0.50	151.62
13317.00	90.60	176.80	8664.87	8643.87	4960.61	4958.36 S	150.99 E	4960.65@	178.26	0.35	151.62
13380.00	90.70	176.70	8664.15	8643.15	5023.59	5021.25 S	154.56 E	5023.63@	178.24	0.23	151.62
13443.00	90.50	175.60	8663.49	8642.49	5086.55	5084.10 S	158.79 E	5086.58@	178.21	1.77	151.62

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13507.00	89.70	175.20	8663.38	8642.38	5150.48	5147.90 S	163.93 E	5150.51@	178.18	1.40	148.01
13570.00	89.80	177.10	8663.66	8642.66	5213.45	5210.75 S	168.16 E	5213.46@	178.15	3.02	148.01
13633.00	89.60	177.00	8663.99	8642.99	5276.44	5273.67 S	171.40 E	5276.45@	178.14	0.35	151.62
13696.00	90.50	178.30	8663.93	8642.93	5339.43	5336.61 S	173.98 E	5339.45@	178.13	2.51	151.62
13759.00	90.70	178.50	8663.27	8642.27	5402.43	5399.59 S	175.74 E	5402.44@	178.14	0.45	151.62
13822.00	90.20	177.00	8662.78	8641.78	5465.42	5462.53 S	178.21 E	5465.44@	178.13	2.51	151.62
13886.00	90.70	177.70	8662.27	8641.27	5529.42	5526.46 S	181.17 E	5529.43@	178.12	1.34	155.24
13949.00	90.80	177.20	8661.45	8640.45	5592.41	5589.39 S	183.98 E	5592.42@	178.11	0.81	151.62
14012.00	90.30	177.00	8660.84	8639.84	5655.40	5652.31 S	187.16 E	5655.41@	178.10	0.85	151.62
14076.00	90.00	176.00	8660.68	8639.68	5719.38	5716.19 S	191.07 E	5719.38@	178.09	1.63	151.62
14138.00	89.90	176.30	8660.73	8639.73	5781.34	5778.05 S	195.23 E	5781.35@	178.06	0.51	151.62
14202.00	89.60	176.30	8661.01	8640.01	5845.31	5841.91 S	199.36 E	5845.32@	178.05	0.47	151.62
14265.00	89.40	175.70	8661.56	8640.56	5908.27	5904.76 S	203.76 E	5908.27@	178.02	1.00	151.62
14328.00	89.30	176.90	8662.28	8641.28	5971.24	5967.62 S	207.82 E	5971.24@	178.01	1.91	151.62
14392.00	89.30	176.40	8663.06	8642.06	6035.22	6031.51 S	211.56 E	6035.22@	177.99	0.78	151.62
14455.00	89.10	177.40	8663.94	8642.94	6098.20	6094.41 S	214.97 E	6098.20@	177.98	1.62	151.62
14518.00	90.40	177.90	8664.21	8643.21	6161.20	6157.35 S	217.55 E	6161.20@	177.98	2.21	151.62
14581.00	90.70	178.10	8663.61	8642.61	6224.19	6220.31 S	219.75 E	6224.19@	177.98	0.57	155.24
14644.00	90.60	177.70	8662.89	8641.89	6287.19	6283.27 S	222.06 E	6287.19@	177.98	0.65	155.24
14707.00	90.40	177.20	8662.34	8641.34	6350.18	6346.20 S	224.86 E	6350.18@	177.97	0.85	155.24
14771.00	90.10	177.00	8662.06	8641.06	6414.17	6410.12 S	228.10 E	6414.17@	177.96	0.56	155.24
14834.00	90.10	177.40	8661.95	8640.95	6477.17	6473.04 S	231.18 E	6477.17@	177.95	0.64	155.24
14895.00	89.70	177.60	8662.06	8641.06	6538.17	6533.98 S	233.84 E	6538.17@	177.95	0.73	155.24
14959.00	90.90	177.60	8661.72	8640.72	6602.16	6597.93 S	236.52 E	6602.16@	177.95	1.88	155.24
15021.00	90.80	177.40	8660.80	8639.80	6664.15	6659.86 S	239.22 E	6664.16@	177.94	0.36	155.24
15084.00	90.60	177.70	8660.04	8639.04	6727.14	6722.80 S	241.92 E	6727.15@	177.94	0.57	155.24
15148.00	90.10	177.70	8659.64	8638.64	6791.14	6786.75 S	244.48 E	6791.15@	177.94	0.78	155.24
15211.00	89.50	177.30	8659.86	8638.86	6854.14	6849.69 S	247.23 E	6854.15@	177.93	1.14	155.24

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC
ROAD LIZARD 5 FED #2H
CULEBRA BLUFF; BONE SPRING
RIG:UDI 216

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
15274.00	89.70	176.60	8660.30	8639.30	6917.13	6912.59 S	250.58 E	6917.13@	177.92	1.16	155.24
15337.00	89.20	175.50	8660.91	8639.91	6980.09	6975.44 S	254.92 E	6980.10@	177.91	1.92	158.85
15400.00	90.30	175.90	8661.18	8640.18	7043.03	7038.26 S	259.65 E	7043.05@	177.89	1.86	155.24
15463.00	90.60	176.20	8660.69	8639.69	7106.00	7101.11 S	263.99 E	7106.01@	177.87	0.67	158.85
15527.00	90.00	176.00	8660.35	8639.35	7169.96	7164.96 S	268.34 E	7169.98@	177.86	0.99	158.85
15590.00	89.60	175.90	8660.57	8639.57	7232.92	7227.80 S	272.79 E	7232.95@	177.84	0.65	158.85
15653.00	90.70	176.00	8660.41	8639.41	7295.88	7290.64 S	277.24 E	7295.91@	177.82	1.75	158.85
15716.00	90.80	176.00	8659.58	8638.58	7358.83	7353.48 S	281.63 E	7358.87@	177.81	0.16	158.85
15779.00	90.60	175.90	8658.81	8637.81	7421.79	7416.32 S	286.08 E	7421.84@	177.79	0.35	158.85
15843.00	90.00	175.40	8658.48	8637.48	7485.73	7480.14 S	290.94 E	7485.79@	177.77	1.22	158.85
15906.00	91.00	176.30	8657.93	8636.93	7548.68	7542.97 S	295.49 E	7548.75@	177.76	2.14	158.85
15969.00	89.80	178.00	8657.49	8636.49	7611.67	7605.88 S	298.63 E	7611.74@	177.75	3.30	158.85
16032.00	89.40	177.80	8657.93	8636.93	7674.67	7668.84 S	300.94 E	7674.74@	177.75	0.71	158.85
16095.00	89.40	177.70	8658.59	8637.59	7737.67	7731.79 S	303.41 E	7737.74@	177.75	0.16	158.85
16159.00	89.40	177.70	8659.26	8638.26	7801.66	7795.73 S	305.98 E	7801.74@	177.75	0.00	162.46
16222.00	89.00	177.40	8660.14	8639.14	7864.65	7858.67 S	308.67 E	7864.73@	177.75	0.79	162.46
16285.00	88.40	177.30	8661.57	8640.57	7927.63	7921.58 S	311.58 E	7927.71@	177.75	0.97	162.46
16380.00	88.10	176.70	8664.47	8643.47	8022.57	8016.41 S	316.55 E	8022.66@	177.74	0.71	162.46
16443.00	89.10	177.40	8666.01	8645.01	8085.55	8079.31 S	319.79 E	8085.63@	177.73	1.94	162.46
16505.00	90.20	178.50	8666.39	8645.39	8147.54	8141.26 S	322.01 E	8147.63@	177.73	2.51	155.24
16568.00	90.80	179.00	8665.84	8644.84	8210.53	8204.25 S	323.38 E	8210.62@	177.74	1.24	158.85
16632.00	89.90	178.90	8665.45	8644.45	8274.52	8268.23 S	324.56 E	8274.60@	177.75	1.41	162.46
16695.00	89.80	179.00	8665.61	8644.61	8337.51	8331.22 S	325.71 E	8337.59@	177.76	0.23	162.46
STRAIGHT LINE PROJECTION TO BIT											
16805.00	89.80	179.00	8666.00	8645.00	8447.50	8441.21 S	327.63 E	8447.56@	177.78	0.00	162.50