

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

Well Name and Num: Almost Heroes 1 Fed 4H
Location: Sec. 1, T24S, R29E
Operator: COG
Drilling Contractor: McVay Drilling Company

30-015-39292

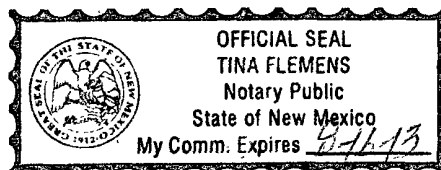
The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.27	187	2.15	5376	89.96	8837
1.09	369	2.86	5612	90.48	9155
0.66	688	1.86	5786	89.25	9344
0.68	984	1.97	5880	92.86	9533
0.54	1220	1.90	6026	91.80	9723
0.74	1721	1.99	6261	90.22	10105
0.28	2036	1.61	6511	90.45	10582
0.09	2256	1.74	6761	89.52	10637
1.25	2476	1.53	7261	90.56	10959
3.02	2872	3.96	7606	92.86	11085
2.82	2966	19.70	7860	85.91	11574
1.77	3123	22.95	7891	84.86	11608
0.96	3336	26.82	7923	86.88	11700
1.63	3650	40.45	8018	93.90	12072
1.38	3775	45.55	8049	89.54	12442
0.96	3336	61.11	8139		
1.47	4090	71.14	8583		

By: *Tina FLEMENS*

Subscribed and sworn to before me this 22 day of September, 2011

Tina FLEMENS
Notary Public, Lea County, New Mexico



30-015-39292

COG OPERATING

Cedar Canyon

Eddy County, NM

Almost Heroes "1" Federal #4H

VH - Job #32K0911864

Survey: Actual

SDI Standard Survey Report

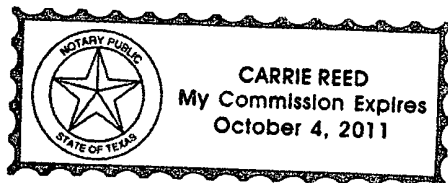
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 4th of October, 2011.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Almost Heroes "1" Federal #4H
Project:	Cedar Canyon	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Almost Heroes "1" Federal #4H	North Reference:	Grid
Wellbore:	VH - Job #32K0911864	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911864	Database:	EDM-Regulatory

Project:	Cedar Canyon		
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:	451,418.62 usft	Latitude:	32° 14' 25.697 N
From:	Lat/Long	Easting:	619,937.35 usft	Longitude:	103° 56' 43.503 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.21 °

Well	Almost Heroes "1" Federal #4H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	451,418.62 usft	Latitude:	32° 14' 25.697 N
	+E/-W	0 0 usft	Easting:	619,937.35 usft	Longitude:	103° 56' 43.503 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0911864				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/9/2011	7.73	60.13	48,587

Design	VH - Job #32K0911864				
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	359 42	

Survey Program		Date: 10/23/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	7,546 0	Actual (VH - Job #32K0911864)	Keeper	Keeper Gyro

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0
100 0	0 20	137 82	100 0	-0 1	0 1	137 82	0 2
200 0	0 26	29 74	200 0	-0 1	0 3	100 08	0 4
300 0	1 36	5 94	300 0	1 3	0 6	23 87	1 4
400 0	1 10	3 71	400 0	3 5	0 8	12 52	3 5
500 0	0 92	350 20	499 9	5 2	0 7	7 58	5 2
600 0	0 70	346 31	599 9	6 6	0 4	3 57	6 6
700 0	0 48	334 26	699 9	7 6	0 1	0 64	7 6
800 0	0 44	304 45	799 9	8 2	-0 4	357 10	8 2
900 0	0 40	278 86	899 9	8 4	-1 1	352 73	8 5
1,000 0	0 40	231 22	999 9	8 3	-1 7	348 42	8 4
1,100 0	0 40	218 02	1,099 9	7 8	-2 2	344 32	8 1

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Almost Heroes "1" Federal #4H
Project:	Cedar Canyon	TVd Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Almost Heroes "1" Federal #4H	North Reference:	Grid
Wellbore:	VH - Job #32K0911864	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911864	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	0 57	203 59	1,199 9	7 0	-2 6	339 76	7 5
1,300 0	0 94	198 21	1,299 9	5 8	-3 0	332 27	6 6
1,400 0	1 19	200 06	1,399 9	4 0	-3 7	317 85	5 5
1,500 0	1 45	201 64	1,499 9	1 9	-4 5	292 89	4 9
1,600 0	1 57	205 33	1,599 8	-0 5	-5 5	264 63	5 6
1,700 0	0 99	206 72	1,699 8	-2 5	-6 5	248 76	7 0
1,800 0	0 71	207 28	1,799 8	-3 9	-7 2	241 79	8 2
1,900 0	0 73	210 15	1,899 8	-5 0	-7 8	237 53	9 2
2,000 0	0 69	213 75	1,999 8	-6 0	-8 4	234 57	10 4
2,100 0	0 60	241 54	2,099 8	-6 8	-9 2	233 82	11 4
2,200 0	0 64	262 03	2,199 8	-7 1	-10 3	235 35	12 5
2,300 0	0 55	257 25	2,299 8	-7 3	-11 3	237 19	13 4
2,400 0	0 36	160 33	2,399 8	-7 7	-11 6	236 61	13 9
2,500 0	2 23	124 09	2,499 7	-9 1	-9 9	227 60	13 4
2,600 0	2 85	121 48	2,599 6	-11 4	-6 2	208 39	13 0
2,700 0	2 87	125 63	2,699 5	-14 2	-2 0	188 14	14 3
2,800 0	3 02	131 33	2,799 4	-17 4	2 0	173 50	17 5
2,900 0	3 17	134 63	2,899 2	-21 1	5 9	164 29	21 9
3,000 0	2 81	136 20	2,999 1	-24 8	9 6	158 85	26 6
3,100 0	2 08	136 86	3,099 0	-27 9	12 5	155 80	30 6
3,200 0	1 69	137 52	3,198 9	-30 3	14 8	154 01	33 7
3,300 0	1 42	135 98	3,298 9	-32 3	16 6	152 75	36 3
3,400 0	1 57	135 30	3,398 9	-34 1	18 4	151 61	38 8
3,500 0	1 61	133 37	3,498 8	-36 1	20 4	150 47	41 5
3,600 0	1 72	133 70	3,598 8	-38 1	22 5	149 38	44 3
3,700 0	1 35	137 58	3,698 8	-40 0	24 4	148 59	46 9
3,800 0	1 33	142 02	3,798 7	-41 8	25 9	148 17	49 2
3,900 0	1 33	139 83	3,898 7	-43 6	27 4	147 85	51 5
4,000 0	1 36	139 40	3,998 7	-45 4	28 9	147 49	53 8
4,100 0	1 38	142 14	4,098 7	-47 2	30 4	147 20	56 2
4,200 0	1 28	143 04	4,198 6	-49 1	31 8	147 02	58 5
4,300 0	1 25	140 60	4,298 6	-50 8	33 2	146 83	60 7
4,400 0	1 34	142 42	4,398 6	-52 6	34 6	146 64	62 9
4,500 0	1 44	143 37	4,498 5	-54 5	36 1	146 50	65 3
4,600 0	1 39	139 97	4,598 5	-56 4	37 6	146 33	67 8
4,700 0	1 45	143 96	4,698 5	-58 4	39 1	146 18	70 3
4,800 0	1 31	154 93	4,798 5	-60 4	40 3	146 27	72 7
4,900 0	1 43	158 06	4,898 4	-62 6	41 3	146 60	75 0
5,000 0	1 44	164 75	4,998 4	-65 0	42 1	147 07	77 4
5,100 0	1 63	164 70	5,098 4	-67 6	42 8	147 66	80 0
5,200 0	1 70	172 21	5,198 3	-70 4	43 4	148 37	82 7
5,300 0	2 09	174 45	5,298 3	-73 7	43 8	149 31	85 7
5,400 0	2 16	170 41	5,398 2	-77 4	44 2	150 24	89 1
5,500 0	2 30	174 49	5,498 1	-81 2	44 8	151 15	92 8

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Almost Heroes "1" Federal #4H
Project:	Cedar Canyon	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Almost Heroes "1" Federal #4H	North Reference:	Grid
Wellbore:	VH - Job #32K0911864	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0911864	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	2 38	179.75	5,598 0	-85 3	45 0	152 22	96 4
5,700 0	2 31	180 48	5,698 0	-89 4	44 9	153 31	100 1
5,800 0	2 07	182 79	5,797 9	-93 2	44 8	154 31	103 5
5,900 0	2 07	181 95	5,897 8	-96 8	44 7	155 23	106 7
6,000 0	1 89	186 42	5,997 8	-100 3	44 4	156 10	109 7
6,100 0	1 83	186 77	6,097 7	-103 5	44 1	156 94	112 5
6,200 0	1 78	185 66	6,197 6	-106 6	43 7	157 70	115 3
6,300 0	1 74	189 93	6,297 6	-109 7	43 3	158 45	117 9
6,400 0	1 77	187 87	6,397 6	-112 7	42 8	159 19	120 6
6,500 0	1 80	190 75	6,497 5	-115 8	42 3	159 91	123 3
6,600 0	1 95	188 95	6,597 5	-119 0	41 8	160 65	126 1
6,700 0	2 04	193 21	6,697 4	-122 4	41 1	161 44	129 1
6,800 0	1 73	196 35	6,797 3	-125 6	40 3	162 22	131 9
6,900 0	1 76	205 15	6,897 3	-128 4	39 2	163 03	134 3
7,000 0	1 58	212 73	6,997 3	-131 0	37 8	163 90	136 3
7,100 0	1 34	219 50	7,097 2	-133 0	36 3	164 73	137 9
7,200 0	1 51	232 59	7,197 2	-134 7	34 5	165 63	139 1
7,300 0	1 65	235 42	7,297 1	-136 4	32 3	166 68	140 1
7,400 0	3 21	216 31	7,397 1	-139 4	29 4	168 07	142 5
7,500 0	4 21	212 70	7,496 8	-144 8	25 8	169 89	147 1
7,546 0	3 83	209 72	7,542 7	-147 5	24 1	170 71	149 5



Scientific Drilling
Directional Drilling Operations

Project: Cedar Canyon
Eddy County, NM
Well: Almost Heroes "1" Federal #4H
Wellbore: VH - Job #32K0911864
Design: VH - Job #32K0911864



Azimuths to Grid North
True North -0.21°
Magnetic North 7.52°

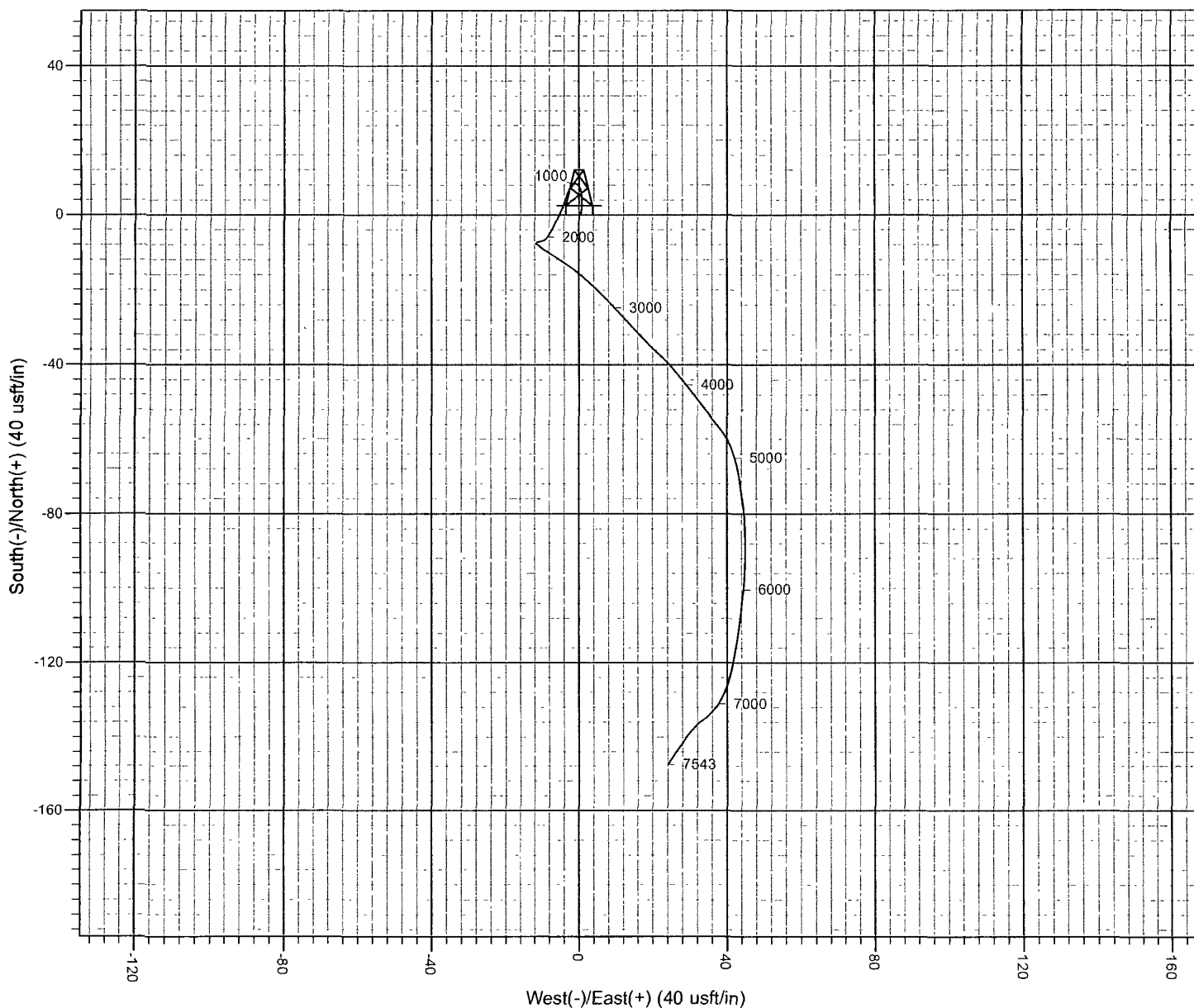
Magnetic Field
Strength 48586.7 nT
Dip Angle 60.13°
Date 9/9/2011
Model IGRF2010

WELL DETAILS: Almost Heroes "1" Federal #4H

WELL @ 0.0usft (Original Well Elev)

Ground Level 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	451418.62	619937.35	32° 14' 25.697 N	103° 56' 43.503 W	



PROJECT DETAILS: Cedar Canyon
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° 14' 25.697 N
Longitude: 103° 56' 43.503 W
Positional Uncertainty: 0.0
Convergence: 0.21
Local North: Grid

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC.
ALMOST HEROES 1 FEDERAL #4H
EDDY COUNTY, NM
Rig:MCVAY 7
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers: JUAN ALCOCER
HUEY SANDIFER

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.14.25.6966 N LON:103.56.43.5025 W
GRID Reference:NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 661272.3200 Y: 451433.5600
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.52° EAST TO GRID
Vertical Section Plane: 359.42
Survey Vert. Reference: 17.00' Kelly Bushing To Ground
Altitude:3096.40' Ground To MSL

Survey Calculations by RX5 V6.03E using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
0.00	0.00	0.00	-0.00	0.00	0.01	0.01 N	0.00 W	0.01@	333.91	0.00
THE FOLLOWING ARE SCIENTIFIC DRILLING GYRO SURVEYS.										
100.00	0.20	137.82	100.00	100.00	-0.12	0.12 S	0.11 E	0.17@	137.01	0.20
200.00	0.26	29.74	200.00	100.00	-0.06	0.05 S	0.34 E	0.35@	98.95	0.37
300.00	1.36	5.94	299.98	100.00	1.32	1.32 N	0.58 E	1.44@	23.62	1.13
400.00	1.10	3.71	399.96	100.00	3.45	3.46 N	0.76 E	3.54@	12.44	0.26
500.00	0.92	350.20	499.95	100.00	5.20	5.21 N	0.69 E	5.26@	7.53	0.30
600.00	0.70	346.31	599.94	100.00	6.59	6.60 N	0.41 E	6.61@	3.54	0.23
700.00	0.48	334.26	699.93	100.00	7.56	7.57 N	0.08 E	7.57@	0.62	0.25
800.00	0.44	304.45	799.93	100.00	8.16	8.16 N	0.42 W	8.17@	357.07	0.24
900.00	0.40	278.86	899.92	100.00	8.44	8.43 N	1.08 W	8.50@	352.71	0.19
1000.00	0.40	231.22	999.92	100.00	8.28	8.27 N	1.70 W	8.44@	348.41	0.32
1100.00	0.40	218.02	1099.92	100.00	7.79	7.77 N	2.18 W	8.07@	344.31	0.09
1200.00	0.57	203.59	1199.92	100.00	7.07	7.04 N	2.60 W	7.51@	339.76	0.21
1300.00	0.94	198.21	1299.91	100.00	5.84	5.81 N	3.05 W	6.56@	332.27	0.38
1400.00	1.19	200.06	1399.89	100.00	4.09	4.05 N	3.66 W	5.46@	317.87	0.25
1500.00	1.45	201.64	1499.86	100.00	1.95	1.90 N	4.49 W	4.87@	292.96	0.26
1600.00	1.57	205.33	1599.83	100.00	-0.46	0.51 S	5.54 W	5.56@	264.71	0.15
1700.00	0.99	206.72	1699.80	100.00	-2.46	2.52 S	6.51 W	6.99@	248.83	0.58
1800.00	0.71	207.28	1799.79	100.00	-3.77	3.85 S	7.19 W	8.15@	241.85	0.28
1900.00	0.73	210.15	1899.78	100.00	-4.87	4.95 S	7.79 W	9.23@	237.59	0.04
2000.00	0.69	213.75	1999.78	100.00	-5.91	6.00 S	8.45 W	10.36@	234.62	0.06
2100.00	0.60	241.54	2099.77	100.00	-6.65	6.75 S	9.24 W	11.44@	233.86	0.32
2200.00	0.64	262.03	2199.77	100.00	-6.97	7.08 S	10.25 W	12.46@	235.39	0.22
2300.00	0.55	257.25	2299.76	100.00	-7.14	7.26 S	11.28 W	13.41@	237.23	0.10
2400.00	0.36	160.33	2399.76	100.00	-7.54	7.66 S	11.64 W	13.93@	236.64	0.69

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC.
ALMOST HEROES 1 FEDERAL #4H
EDDY COUNTY, NM
RIG:MCVAY 7

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
2500.00	2.23	124.09	2499.73	100.00	-8.95	9.05 S	9.92 W	13.43@	227.64	1.95
2600.00	2.85	121.48	2599.63	100.00	-11.37	11.44 S	6.19 W	13.00@	208.42	0.63
2700.00	2.87	125.63	2699.51	100.00	-14.17	14.19 S	2.03 W	14.34@	188.16	0.21
2800.00	3.02	131.33	2799.37	100.00	-17.41	17.39 S	1.98 E	17.50@	173.51	0.33
2900.00	3.17	134.63	2899.23	100.00	-21.13	21.07 S	5.92 E	21.89@	164.30	0.23
3000.00	2.81	136.20	2999.09	100.00	-24.88	24.78 S	9.59 E	26.57@	158.85	0.37
3100.00	2.08	136.86	3099.00	100.00	-28.00	27.88 S	12.53 E	30.56@	155.80	0.73
3200.00	1.69	137.52	3198.95	100.00	-30.44	30.29 S	14.76 E	33.70@	154.01	0.39
3300.00	1.42	135.98	3298.91	100.00	-32.43	32.27 S	16.62 E	36.30@	152.75	0.27
3400.00	1.57	135.30	3398.87	100.00	-34.32	34.13 S	18.44 E	38.80@	151.61	0.15
3500.00	1.61	133.37	3498.84	100.00	-36.28	36.07 S	20.43 E	41.45@	150.47	0.07
3600.00	1.72	133.70	3598.79	100.00	-38.30	38.07 S	22.54 E	44.24@	149.38	0.11
3700.00	1.35	137.58	3698.76	100.00	-40.22	39.98 S	24.42 E	46.84@	148.59	0.38
3800.00	1.33	142.02	3798.73	100.00	-42.02	41.76 S	25.92 E	49.16@	148.17	0.11
3900.00	1.33	139.83	3898.70	100.00	-43.84	43.57 S	27.39 E	51.46@	147.84	0.05
4000.00	1.36	139.40	3998.68	100.00	-45.64	45.35 S	28.91 E	53.78@	147.49	0.03
4100.00	1.38	142.14	4098.65	100.00	-47.51	47.20 S	30.42 E	56.16@	147.20	0.07
4200.00	1.28	143.04	4198.62	100.00	-49.37	49.05 S	31.83 E	58.47@	147.02	0.10
4300.00	1.25	140.60	4298.60	100.00	-51.12	50.78 S	33.19 E	60.67@	146.83	0.06
4400.00	1.34	142.42	4398.57	100.00	-52.90	52.55 S	34.60 E	62.92@	146.64	0.10
4500.00	1.44	143.37	4498.54	100.00	-54.85	54.49 S	36.06 E	65.34@	146.50	0.10
4600.00	1.39	139.97	4598.51	100.00	-56.80	56.42 S	37.59 E	67.80@	146.33	0.10
4700.00	1.45	143.96	4698.48	100.00	-58.77	58.38 S	39.12 E	70.27@	146.18	0.12
4800.00	1.31	154.93	4798.45	100.00	-60.84	60.43 S	40.34 E	72.66@	146.27	0.30
4900.00	1.43	158.06	4898.42	100.00	-63.04	62.63 S	41.30 E	75.02@	146.60	0.14
5000.00	1.44	164.75	4998.39	100.00	-65.42	65.00 S	42.09 E	77.44@	147.07	0.17
5100.00	1.63	164.70	5098.36	100.00	-68.01	67.58 S	42.80 E	79.99@	147.65	0.19
5200.00	1.70	172.21	5198.31	100.00	-70.86	70.42 S	43.37 E	82.71@	148.37	0.23

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC.
ALMOST HEROES 1 FEDERAL #4H
EDDY COUNTY, NM
RIG:MCVAY 7

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
5300.00	2.09	174.45	5298.26	100.00	-74.15	73.71 S	43.75 E	85.71@	149.31	0.40
5400.00	2.16	170.41	5398.19	100.00	-77.82	77.38 S	44.24 E	89.14@	150.24	0.17
5500.00	2.30	174.49	5498.11	100.00	-81.68	81.24 S	44.75 E	92.75@	151.15	0.21
5600.00	2.38	179.75	5598.03	100.00	-85.76	85.31 S	44.95 E	96.43@	152.21	0.23
5700.00	2.31	180.48	5697.95	100.00	-89.85	89.40 S	44.94 E	100.06@	153.31	0.08
5800.00	2.07	182.79	5797.87	100.00	-93.67	93.22 S	44.84 E	103.44@	154.31	0.25
5900.00	2.07	181.95	5897.81	100.00	-97.28	96.83 S	44.69 E	106.64@	155.23	0.03
6000.00	1.89	186.42	5997.75	100.00	-100.72	100.27 S	44.44 E	109.68@	156.10	0.24
6100.00	1.83	186.77	6097.70	100.00	-103.94	103.50 S	44.07 E	112.49@	156.94	0.06
6200.00	1.78	185.66	6197.65	100.00	-107.07	106.63 S	43.73 E	115.25@	157.70	0.06
6300.00	1.74	189.93	6297.60	100.00	-110.10	109.67 S	43.31 E	117.91@	158.45	0.14
6400.00	1.77	187.87	6397.55	100.00	-113.12	112.69 S	42.84 E	120.56@	159.19	0.07
6500.00	1.80	190.75	6497.50	100.00	-116.19	115.77 S	42.34 E	123.27@	159.91	0.09
6600.00	1.95	188.95	6597.45	100.00	-119.41	118.99 S	41.78 E	126.11@	160.65	0.16
6700.00	2.04	193.21	6697.39	100.00	-122.81	122.40 S	41.11 E	129.12@	161.44	0.17
6800.00	1.73	196.35	6797.34	100.00	-125.99	125.59 S	40.28 E	131.89@	162.22	0.33
6900.00	1.76	205.15	6897.29	100.00	-128.81	128.42 S	39.20 E	134.27@	163.03	0.27
7000.00	1.58	212.73	6997.25	100.00	-131.35	130.97 S	37.80 E	136.32@	163.90	0.28
7100.00	1.34	219.50	7097.21	100.00	-133.40	133.04 S	36.31 E	137.90@	164.73	0.30
7200.00	1.51	232.59	7197.18	100.00	-135.08	134.74 S	34.52 E	139.09@	165.63	0.37
7300.00	1.65	235.42	7297.15	100.00	-136.68	136.36 S	32.29 E	140.13@	166.68	0.16
7400.00	3.21	216.31	7397.05	100.00	-139.72	139.43 S	29.44 E	142.50@	168.08	1.74
7500.00	4.21	212.70	7496.84	100.00	-145.03	144.77 S	25.80 E	147.06@	169.89	1.03
** TIE IN TO SCIENTIFIC DRILLING GYRO SURVEYS.										
7546.00	3.83	209.72	7542.73	46.00	-147.77	147.53 S	24.13 E	149.49@	170.71	0.94
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
7606.00	3.96	202.20	7602.59	60.00	-151.41	151.19 S	22.35 E	152.83@	171.59	0.88
7638.00	3.87	203.78	7634.52	32.00	-153.41	153.20 S	21.50 E	154.70@	172.01	0.44
7669.00	2.81	212.92	7665.46	31.00	-155.00	154.80 S	20.67 E	156.17@	172.40	3.82

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC.
ALMOST HEROES 1 FEDERAL #4H
EDDY COUNTY, NM
RIG:MCVAY 7

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
7701.00	2.37	322.34	7697.45	32.00	-155.12	154.93 S	19.84 E	156.19@	172.70	13.24
7733.00	6.51	350.56	7729.35	32.00	-152.80	152.62 S	19.13 E	153.81@	172.85	14.25
7764.00	10.55	355.13	7760.00	31.00	-148.23	148.05 S	18.60 E	149.22@	172.84	13.20
7796.00	14.16	357.41	7791.25	32.00	-141.40	141.22 S	18.18 E	142.39@	172.67	11.38
7828.00	17.15	356.36	7822.06	32.00	-132.77	132.60 S	17.70 E	133.78@	172.40	9.39
7860.00	19.70	358.12	7852.42	32.00	-122.67	122.50 S	17.22 E	123.70@	172.00	8.16
7891.00	22.95	359.43	7881.29	31.00	-111.40	111.23 S	16.99 E	112.52@	171.31	10.60
7923.00	26.82	1.63	7910.32	32.00	-97.94	97.77 S	17.14 E	99.26@	170.06	12.43
7955.00	31.39	1.72	7938.27	32.00	-82.39	82.22 S	17.59 E	84.08@	167.92	14.28
7986.00	35.61	359.87	7964.11	31.00	-65.29	65.11 S	17.81 E	67.51@	164.70	14.00
8018.00	40.45	357.24	7989.31	32.00	-45.59	45.42 S	17.29 E	48.60@	159.15	15.95
8049.00	45.55	355.21	8011.98	31.00	-24.49	24.33 S	15.88 E	29.06@	146.86	17.04
8081.00	50.83	354.69	8033.30	32.00	-0.72	0.58 S	13.78 E	13.79@	92.41	16.54
8112.00	56.72	353.63	8051.62	31.00	24.17	24.29 N	11.23 E	26.76@	24.81	19.20
8139.00	61.11	353.72	8065.55	27.00	47.17	47.26 N	8.68 E	48.05@	10.41	16.26
8171.00	65.60	354.86	8079.90	32.00	75.65	75.71 N	5.84 E	75.94@	4.41	14.39
8203.00	68.59	355.57	8092.35	32.00	105.05	105.09 N	3.39 E	105.14@	1.85	9.56
8234.00	71.93	356.74	8102.82	31.00	134.17	134.19 N	1.43 E	134.20@	0.61	11.34
8298.00	72.11	356.88	8122.58	64.00	194.98	194.97 N	1.95 W	194.98@	359.43	0.35
8362.00	70.96	356.63	8142.85	64.00	255.62	255.58 N	5.39 W	255.64@	358.79	1.84
8425.00	69.73	356.33	8164.04	63.00	314.87	314.80 N	9.03 W	314.93@	358.36	2.00
8487.00	69.82	356.09	8185.47	62.00	372.96	372.85 N	12.88 W	373.07@	358.02	0.39
8519.00	69.82	355.47	8196.51	32.00	402.93	402.80 N	15.09 W	403.08@	357.85	1.82
8551.00	69.29	355.46	8207.69	32.00	432.84	432.69 N	17.46 W	433.04@	357.69	1.66
8583.00	71.14	357.55	8218.52	32.00	462.91	462.74 N	19.29 W	463.14@	357.61	8.44
8615.00	74.92	359.66	8227.86	32.00	493.51	493.33 N	20.03 W	493.74@	357.67	13.39
8647.00	78.61	1.65	8235.19	32.00	524.65	524.47 N	19.67 W	524.84@	357.85	13.02
8679.00	81.34	2.65	8240.76	32.00	556.12	555.96 N	18.49 W	556.27@	358.10	9.07

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8711.00	83.36	2.18	8245.02	32.00	587.79	587.64 N	17.15 W	587.89@	358.33	6.48
8742.00	85.56	2.04	8248.01	31.00	618.61	618.48 N	16.02 W	618.68@	358.52	7.11
8774.00	85.91	1.78	8250.39	32.00	650.49	650.37 N	14.95 W	650.54@	358.68	1.36
8805.00	88.11	1.91	8252.01	31.00	681.42	681.31 N	13.95 W	681.45@	358.83	7.11
8837.00	89.96	1.55	8252.55	32.00	713.38	713.29 N	12.99 W	713.41@	358.96	5.89
8868.00	89.87	1.38	8252.59	31.00	744.36	744.28 N	12.20 W	744.38@	359.06	0.62
8964.00	88.90	0.02	8253.62	96.00	840.33	840.26 N	11.02 W	840.34@	359.25	1.74
9060.00	90.31	359.63	8254.28	96.00	936.32	936.26 N	11.32 W	936.33@	359.31	1.52
9155.00	90.48	359.27	8253.63	95.00	1031.32	1031.25 N	12.23 W	1031.32@	359.32	0.42
9250.00	89.25	358.78	8253.85	95.00	1126.32	1126.23 N	13.85 W	1126.32@	359.30	1.39
9344.00	89.25	359.41	8255.08	94.00	1220.31	1220.22 N	15.33 W	1220.31@	359.28	0.67
9439.00	90.13	359.14	8255.60	95.00	1315.30	1315.20 N	16.53 W	1315.31@	359.28	0.97
9533.00	92.86	359.25	8253.15	94.00	1409.26	1409.16 N	17.85 W	1409.27@	359.27	2.91
9628.00	92.95	358.37	8248.33	95.00	1504.13	1504.01 N	19.82 W	1504.14@	359.24	0.93
9723.00	91.80	359.60	8244.39	95.00	1599.05	1598.91 N	21.50 W	1599.06@	359.23	1.77
9819.00	92.15	359.72	8241.08	96.00	1694.99	1694.85 N	22.07 W	1695.00@	359.25	0.39
9915.00	90.31	0.17	8239.02	96.00	1790.96	1790.83 N	22.16 W	1790.96@	359.29	1.97
10010.00	89.69	358.63	8239.02	95.00	1885.96	1885.82 N	23.16 W	1885.96@	359.30	1.75
10105.00	90.22	358.84	8239.10	95.00	1980.95	1980.79 N	25.26 W	1980.95@	359.27	0.60
10201.00	88.55	0.27	8240.13	96.00	2076.94	2076.78 N	26.00 W	2076.94@	359.28	2.29
10296.00	89.60	0.26	8241.66	95.00	2171.91	2171.76 N	25.56 W	2171.92@	359.33	1.11
10392.00	89.87	0.30	8242.11	96.00	2267.90	2267.76 N	25.09 W	2267.90@	359.37	0.28
10487.00	89.87	0.59	8242.32	95.00	2362.88	2362.76 N	24.36 W	2362.88@	359.41	0.31
10582.00	90.48	0.67	8242.03	95.00	2457.86	2457.75 N	23.31 W	2457.86@	359.46	0.65
10677.00	89.52	359.67	8242.03	95.00	2552.85	2552.75 N	23.03 W	2552.85@	359.48	1.46
10773.00	89.08	359.28	8243.21	96.00	2648.84	2648.74 N	23.91 W	2648.85@	359.48	0.61
10866.00	89.87	359.23	8244.06	93.00	2741.84	2741.73 N	25.12 W	2741.84@	359.48	0.85
10959.00	90.04	359.54	8244.13	93.00	2834.84	2834.72 N	26.12 W	2834.84@	359.47	0.38

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11051.00	94.00	359.40	8240.89	92.00	2926.76	2926.64 N	26.97 W	2926.77@	359.47	4.31
11146.00	92.86	0.08	8235.20	95.00	3021.59	3021.47 N	27.40 W	3021.59@	359.48	1.40
11238.00	91.98	1.69	8231.32	92.00	3113.47	3113.37 N	25.98 W	3113.48@	359.52	1.99
11331.00	89.08	1.63	8230.46	93.00	3206.39	3206.32 N	23.28 W	3206.40@	359.58	3.12
11423.00	86.88	3.04	8233.70	92.00	3298.21	3298.18 N	19.54 W	3298.23@	359.66	2.84
11514.00	85.91	2.44	8239.42	91.00	3388.87	3388.89 N	15.20 W	3388.93@	359.74	1.25
11608.00	84.86	1.37	8246.99	94.00	3482.48	3482.53 N	12.08 W	3482.55@	359.80	1.59
11700.00	86.88	0.52	8253.61	92.00	3574.20	3574.27 N	10.57 W	3574.29@	359.83	2.38
11793.00	88.72	359.57	8257.18	93.00	3667.12	3667.20 N	10.50 W	3667.22@	359.84	2.23
11885.00	88.99	0.08	8259.02	92.00	3759.10	3759.18 N	10.78 W	3759.20@	359.84	0.63
11978.00	89.43	359.46	8260.30	93.00	3852.09	3852.17 N	11.15 W	3852.19@	359.83	0.82
12072.00	93.30	0.82	8258.06	94.00	3946.03	3946.12 N	10.92 W	3946.14@	359.84	4.36
12164.00	91.63	0.93	8254.11	92.00	4037.92	4038.03 N	9.52 W	4038.04@	359.86	1.82
12257.00	91.01	359.80	8251.97	93.00	4130.88	4131.00 N	8.93 W	4131.01@	359.88	1.38
12349.00	90.84	359.34	8250.48	92.00	4222.86	4222.98 N	9.62 W	4222.99@	359.87	0.53
12442.00	89.34	358.58	8250.33	93.00	4315.86	4315.96 N	11.30 W	4315.98@	359.85	1.81
12534.00	88.64	358.27	8251.96	92.00	4407.83	4407.91 N	13.83 W	4407.94@	359.82	0.83
12651.00	88.20	358.42	8255.18	117.00	4524.76	4524.82 N	17.21 W	4524.85@	359.78	0.40
STRAIGHT LINE PROJECTION TO BIT @ 12,701' MD.										
12701.00	88.20	358.42	8256.75	50.00	4574.73	4574.78 N	18.59 W	4574.81@	359.77	0.00

** The survey data at tie-in point was furnished by a recognized survey company and entered as submitted. Survey stations above the tie-in point represent recalculated data by PathFinder Energy Services, Inc. and may reflect minor changes due to rounding differences between survey programs. Only survey stations taken by qualified PathFinder personnel are subject to certification.