

Results of Directional Survey

API number:	30-025-40103		
OGRID:		Operator:	COG OPERATING LLC
		Property:	STRATOJET 31 STATE COM # 3H

surface	ULSTR:	N	31	T	20S	R	35E
				330	FSL	1980	FWL

BH Loc	ULSTR:	C	31	T	20S	R	35E
15062	MD	10758.4	TVD	4949	FSL	1943	FWL

Top Perf/OH	ULSTR:	N	31	T	20S	R	35E
11024	MD	10735.1	TVD	916	FSL	1911	FWL

Bot Perf/OH	ULSTR:	C	31	T	20S	R	35E
14962	MD	10758.1	TVD	4849	FSL	1940	FWL

	MD	N/S	E/W	VD
	10993	556.47	-68.39	10726.82
TOP PERFS/OH	11024	586.35	-69.12	10735.05
	11024	586.35	-69.12	10735.05
	14874	4430.59	-42.29	10757.86
BOT PERFS/OH	14962	4518.55	-39.69	10758.13
	15015	4571.53	-38.13	10758.30

NEXT TO LAST	14874	4430.59	-42.29	10757.86
LAST READING	15015	4571.53	-38.13	10758.30
TD	15062	4618.51	-36.74	10758.45

Surface Location	330	FS	1980	FW
Projected BHL	4949	FS	1943	FW
Location of				
Top Perfs/OH	916	FS	1911	FW
Bottom Perfs/OH	4849	FS	1940	FW

SUMMARY of Subsurface Locations

Surface Location	N-31-20S-35E	330	FS	1980	FW	Vert. Depth
Top Perfs/OH	N-31-20S-35E	916	FS	1911	FW	10735.05
Bottom Perfs/OH	C-31-20S-35E	4849	FS	1940	FW	10758.13
Projected TD	C-31-20S-35E	4949	FS	1943	FW	10758.45

AUG 31 2011

**McVAY DRILLING COMPANY**

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

HOBBS OCD**AUG 18 2011****RECEIVED**

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JUL 05 2011
ARTESIA WEST

Well Name and Num: Strato Jet 31 State Com #3H
Location: Sec. 31, T20S, R35E
Operator: COG
Drilling Contractor: McVay Drilling Company

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>	<u>Degrees @</u>	<u>Depth</u>
0.63	362	1.36	8619	62.34	10812	90.04	15015
0.58	746	3.99	9124	75.71	11024		
1.00	994	3.92	9378	85.03	11272		
0.75	1374	3.89	9569	91.19	11453		
1.00	1811	3.24	9728	90.57	11949		
0.26	2168	3.55	9982	90.40	12228		
0.20	2513	4.02	10262	89.78	12506		
0.25	2859	2.52	10941	87.05	12878		
2.95	3549	3.01	11095	88.72	13064		
2.24	3706	3.68	11589	92.86	13443		
1.37	3584	3.69	10194	90.31	13829		
0.99	4240	3.78	10215	89.08	14117		
2.00	5700	5.63	10225	92.86	13443		
1.05	6100	27.26	10379	90.31	13829		
0.65	6600	38.95	10503	89.08	14117		
1.54	7100	54.43	10688	90.66	14405		
1.42	8113	55.66	10250	89.60	14592		

SUR: N-31-20s-35e, 330/S & 1980/W
BHL: C-31-20s-35e, 4949/S & 1943/W
API # 30-025-40103

By: *Tina Flemens*

Subscribed and sworn to before me this 30th day of June, 2011

Tina Flemens
Notary Public, Lea County, New Mexico



SUR: N-31-20s-35e, 330/S & 1980/W
BHL: C-31-20s-35e, 4949/S & 1943/W
API # 30-025-40103

COG OPERATING

Berry
Lea County, NM
Stratojet 31 State Com #3H
VH - Job #32K0611555

HOBBS OCD

AUG 18 2011

Survey: Actual

RECEIVED

SDI Standard Survey Report

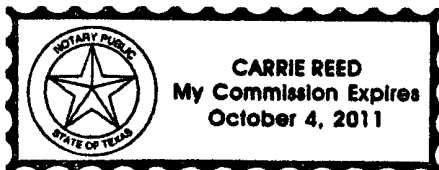
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 22nd of July, 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 Stratojet 31 State Com #3H
Project:	Berry	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Stratojet 31 State Com #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0611555	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611555	Database:	EDM-Regulatory

Project	Berry		
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		Lea County, NM			
Site Position:		Northing:	558,260 79 usft	Latitude:	32° 31' 55 200 N
From:	Lat/Long	Easting:	757,138 31 usft	Longitude:	103° 29' 56 400 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 45 °

Well	Stratojet 31 State Com #3H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	558,260 79 usft	Latitude:	32° 31' 55 200 N
	+E/-W	0 0 usft	Easting:	757,138 31 usft	Longitude:	103° 29' 56 400 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0611555				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/14/2011	7 58	60 49	48,837

Design		VH - Job #32K0611555		
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 63

Survey Program		Date 7/21/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	10,150 0	Actual (VH - Job #32K0611555)	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 48	279 46	100 0	0 1	-0 4	279 46	0 4	
200 0	0 57	279 36	200 0	0 2	-1 3	279 42	1 3	
300 0	0 57	278 08	300 0	0 4	-2 3	279 12	2 3	
400 0	0 45	269 39	400 0	0 4	-3 2	277 78	3 2	
500 0	0 36	266 31	500 0	0 4	-3 9	276 02	3 9	
600 0	0 38	268 33	600 0	0 4	-4 5	274 80	4 6	
700 0	0 44	237 04	700 0	0 2	-5 2	271 79	5 2	
800 0	0 81	232 93	800 0	-0 5	-6 1	265 55	6 1	
900 0	0 80	212 68	900 0	-1 5	-7 0	258 04	7 2	
1,000 0	0 66	193 94	1,000 0	-2 6	-7 5	250 73	8 0	
1,100 0	0 82	181 88	1,099 9	-3 9	-7 7	243 08	8 6	

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Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Stratojet 31 State Com #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0611555	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611555	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 84	175 59	1,199 9	-5 4	-7 7	235 06	9 3
1,300 0	0 97	172 24	1,299 9	-6 9	-7 5	227 26	10 2
1,400 0	0 76	170 12	1,399 9	-8 4	-7 3	220 80	11 1
1,500 0	0 70	170 42	1,499 9	-9 7	-7 0	216 09	12 0
1,600 0	0 81	178 75	1,599 9	-11 0	-6 9	212 26	13 0
1,700 0	1 29	208 92	1,699 9	-12 7	-7 5	210 49	14 7
1,800 0	1 62	226 27	1,799 8	-14 6	-9 0	211 67	17 2
1,900 0	1 68	233 25	1,899 8	-16 5	-11 2	214 24	19 9
2,000 0	0 79	235 24	1,999 8	-17 8	-13 0	216 13	22 0
2,100 0	0 62	235 04	2,099 8	-18 5	-14 0	217 12	23 2
2,200 0	0 60	240 00	2,199 8	-19 0	-14 9	218 00	24 2
2,300 0	0 42	237 52	2,299 8	-19 5	-15 6	218 73	25 0
2,400 0	0 33	245 37	2,399 8	-19 8	-16 2	219 28	25 6
2,500 0	0 32	230 26	2,499 8	-20 1	-16 7	219 68	26 1
2,600 0	0 07	171 43	2,599 8	-20 3	-16 9	219 69	26 4
2,700 0	0 26	104 76	2,699 8	-20 5	-16 7	219 14	26 4
2,800 0	0 24	76 33	2,799 8	-20 5	-16 2	218 41	26 1
2,900 0	0 66	77 99	2,899 8	-20 3	-15 5	217 30	25 5
3,000 0	1 30	66 30	2,999 7	-19 7	-13 9	215 10	24 1
3,100 0	1 95	70 04	3,099 7	-18 7	-11 2	210 99	21 8
3,200 0	2 24	66 02	3,199 6	-17 3	-7 8	204 37	19 0
3,300 0	2 40	64 63	3,299 6	-15 6	-4 2	194 93	16 2
3,400 0	2 60	64 40	3,399 5	-13 7	-0 2	180 95	13 7
3,500 0	2 85	63 23	3,499 3	-11 6	4 0	160 88	12 3
3,600 0	2 72	61 59	3,599 2	-9 4	8 3	138 40	12 6
3,700 0	2 13	60 02	3,699 1	-7 3	12 0	121 37	14 1
3,800 0	1 74	55 12	3,799 1	-5 5	14 9	110 41	15 9
3,900 0	1 55	52 08	3,899 0	-3 8	17 2	102 59	17 6
4,000 0	1 71	50 48	3,999 0	-2 1	19 4	96 07	19 5
4,100 0	1 39	52 92	4,099 0	-0 4	21 5	91 02	21 5
4,200 0	1 05	60 45	4,198 9	0 8	23 3	88 04	23 3
4,300 0	0 97	66 71	4,298 9	1 6	24 9	86 35	24 9
4,400 0	0 81	59 48	4,398 9	2 3	26 3	85 04	26 4
4,500 0	0 63	53 82	4,498 9	3 0	27 3	83 81	27 5
4,600 0	0 66	42 87	4,598 9	3 7	28 2	82 49	28 4
4,700 0	1 30	30 15	4,698 9	5 1	29 1	80 04	29 6
4,800 0	2 04	32 65	4,798 8	7 6	30 7	76 09	31 6
4,900 0	2 64	28 62	4,898 8	11 1	32 7	71 24	34 6
5,000 0	3 15	35 14	4,998 6	15 4	35 4	66 51	38 6
5,100 0	3 37	36 41	5,098 5	20 0	38 7	62 69	43 6
5,200 0	3 58	36 82	5,198 3	24 9	42 3	59 58	49 1
5,300 0	3 31	34 87	5,298 1	29 7	45 9	57 05	54 7
5,400 0	2 68	39 78	5,398 0	33 9	49 0	55 33	59 6
5,500 0	2 55	42 10	5,497 9	37 3	52 0	54 32	64 0

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Wellbore:	VH - Job #32K0611555	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611555	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 01	41 74	5,597 8	40 3	54 7	53 60	67 9
5,700 0	1 80	39 89	5,697 7	42 8	56 8	53 01	71 2
5,800 0	1 60	31 94	5,797 7	45 2	58 6	52 34	74 0
5,900 0	1 20	48 86	5,897 6	47 1	60 1	51 93	76 3
6,000 0	1 22	49 44	5,997 6	48 5	61 7	51 86	78 5
6,100 0	1 21	54 11	6,097 6	49 8	63 4	51 85	80 6
6,200 0	0 99	58 17	6,197 6	50 8	65 0	51 95	82 5
6,300 0	0 97	51 93	6,297 6	51 8	66 4	52 01	84 2
6,400 0	0 92	57 22	6,397 6	52 8	67 7	52 06	85 8
6,500 0	1 06	53 34	6,497 5	53 8	69 1	52 12	87 6
6,600 0	0 95	51 50	6,597 5	54 8	70 5	52 13	89 3
6,700 0	0 93	59 83	6,697 5	55 8	71 9	52 19	90 9
6,800 0	0 71	87 57	6,797 5	56 2	73 2	52 48	92 3
6,900 0	0 70	90 40	6,897 5	56 2	74 4	52 93	93 3
7,000 0	0 64	90 54	6,997 5	56 2	75 6	53 36	94 2
7,100 0	0 48	119 23	7,097 5	56 0	76 5	53 80	94 8
7,200 0	0 47	124 70	7,197 5	55 6	77 2	54 26	95 1
7,300 0	0 70	164 23	7,297 5	54 7	77 7	54 84	95 0
7,400 0	0 91	160 81	7,397 5	53 4	78 1	55 65	94 6
7,500 0	1 40	177 40	7,497 4	51 4	78 4	56 75	93 8
7,600 0	1 38	184 80	7,597 4	49 0	78 4	57 99	92 5
7,700 0	1 40	202 78	7,697 4	46 7	77 8	59 05	90 8
7,800 0	1 38	218 91	7,797 4	44 6	76 6	59 78	88 6
7,900 0	1 32	235 43	7,897 3	43 0	74 9	60 12	86 4
8,000 0	1 47	248 46	7,997 3	41 9	72 8	60 06	84 0
8,100 0	1 42	251 44	8,097 3	41 0	70 4	59 76	81 5
8,200 0	1 41	260 66	8,197 2	40 4	68 0	59 26	79 1
8,300 0	1 37	259 47	8,297 2	40 0	65 6	58 62	76 8
8,400 0	1 39	261 52	8,397 2	39 6	63 2	57 93	74 6
8,500 0	1 39	260 71	8,497 2	39 2	60 8	57 17	72 4
8,600 0	1 60	270 87	8,597 1	39 1	58 2	56 14	70 1
8,700 0	1 72	271 92	8,697 1	39 1	55 3	54 73	67 8
8,800 0	2 63	283 70	8,797 0	39 7	51 6	52 41	65 1
8,900 0	3 84	289 31	8,896 8	41 4	46 2	48 16	62 0
9,000 0	4 01	286 76	8,996 6	43 5	39 7	42 39	58 9
9,100 0	4 33	286 80	9,096 3	45 6	32 8	35 69	56 2
9,200 0	4 95	281 88	9,196 0	47 6	24 9	27 64	53 7
9,300 0	4 96	281 33	9,295 6	49 3	16 5	18 46	52 0
9,400 0	4 61	279 27	9,395 3	50 8	8 3	9 23	51 5
9,500 0	4 11	275 62	9,495 0	51 8	0 7	0 80	51 8
9,600 0	3 78	259 78	9,594 8	51 6	-6 1	353 27	51 9
9,700 0	3 50	246 13	9,694 6	49 8	-12 1	346 31	51 2
9,800 0	3 91	242 25	9,794 4	46 9	-17 9	339 09	50 2
9,900 0	3 65	243 53	9,894 1	43 9	-23 8	331 56	50 0

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Stratojet 31 State Com #3H
Project:	Berry	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Stratojet 31 State Com #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0611555	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0611555	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
10,000 0	3 63	242 67	9,993 9	41 1	-29 5	324 34	50 5
10,100 0	3 69	246 34	10,093 7	38 3	-35 2	317 41	52 0
10,150 0	4 00	244 39	10,143 6	36 9	-38 3	313 97	53 2



Project: Berry
Lea County, NM
Well: Stratojet 31 State Com #3H
Wellbore: VH - Job #32K0611555
Design: VH - Job #32K0611555

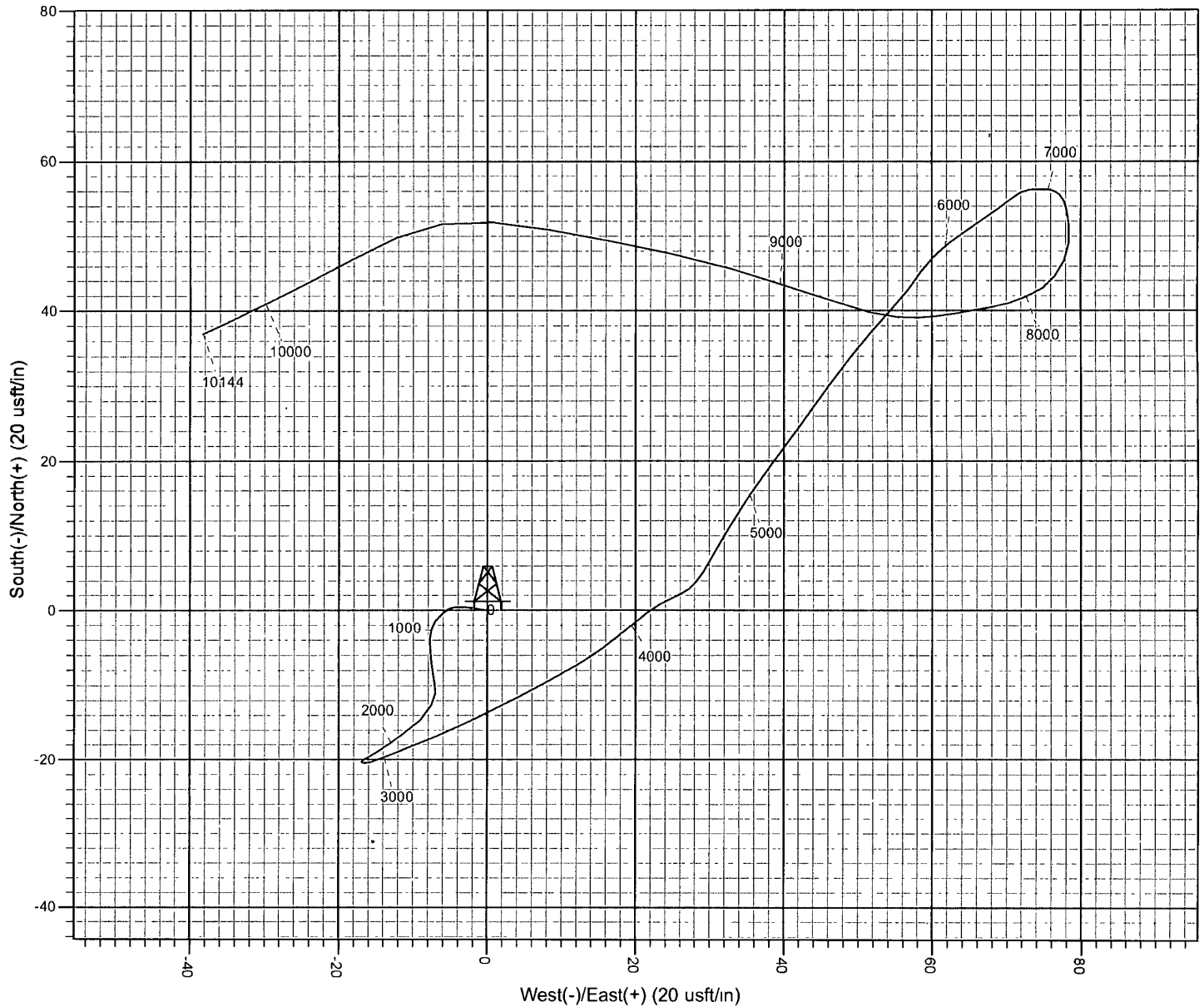


Azimuths to Grid North
True North -0 45°
Magnetic North 7 13°

Magnetic Field
Strength 48836 9snT
Dip Angle 60 49°
Date 6/14/2011
Model IGRF2010

WELL DETAILS: Stratojet 31 State Com #3H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0 0	0.0	558260.79	757138.31	32° 31' 55.200 N	103° 29' 56 400 W	



PROJECT DETAILS: Berry
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: Lea County, NM
Site Centre Latitude: 32° 31' 55.200 N
Longitude: 103° 29' 56.400 W
Positional Uncertainty: 0.0
Convergence: 0.45
Local North: Grid

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC
STRATOJET 31 STATE COM #3H
LEA COUNTY, NEW MEXICO
Rig:McVay 7

PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers: E. PAYNE
K.THURMAN
P. DAS

Survey Calculations by RX5 V6.03E using Minimum Curvature

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.31.23.2463 N LON:103.29.53.8060 W
GRID Reference:NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 757385.7000 Y: 555033.4000
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.13°EAST TO GRID
Vertical Section Plane: 359.63
Survey Vert. Reference: 17.00' Kelly Bushing To Ground
Altitude:3725.00' Ground To MSL

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)
THE FOLLOWING ARE SCIENTIFIC DRILLING GYRO SURVEYS.										
0.00	0.00	0.00	-0.00	0.00	-0.05	0.05 S	0.05 E	0.07@	140.04	0.00
100.00	0.48	279.46	99.99	100.00	0.02	0.01 N	0.37 W	0.37@	272.23	0.48
200.00	0.57	279.36	199.99	100.00	0.17	0.16 N	1.27 W	1.28@	277.35	0.09
300.00	0.57	278.08	299.99	100.00	0.33	0.31 N	2.25 W	2.28@	277.95	0.01
400.00	0.45	269.39	399.98	100.00	0.40	0.38 N	3.14 W	3.16@	276.91	0.14
500.00	0.36	266.31	499.98	100.00	0.38	0.36 N	3.85 W	3.86@	275.29	0.09
600.00	0.38	268.33	599.98	100.00	0.36	0.33 N	4.49 W	4.50@	274.16	0.02
700.00	0.44	237.04	699.97	100.00	0.14	0.11 N	5.14 W	5.15@	271.20	0.23
800.00	0.81	232.93	799.97	100.00	-0.49	0.53 S	6.03 W	6.05@	265.00	0.37
900.00	0.80	212.68	899.96	100.00	-1.50	1.54 S	6.97 W	7.14@	257.54	0.28
1000.00	0.66	193.94	999.95	100.00	-2.64	2.69 S	7.49 W	7.96@	250.25	0.27
1100.00	0.82	181.88	1099.94	100.00	-3.91	3.96 S	7.65 W	8.61@	242.62	0.22
1200.00	0.84	175.59	1199.93	100.00	-5.36	5.41 S	7.62 W	9.34@	234.63	0.09
1300.00	0.97	172.24	1299.92	100.00	-6.93	6.98 S	7.45 W	10.20@	226.86	0.14
1400.00	0.76	170.12	1399.91	100.00	-8.42	8.47 S	7.22 W	11.13@	220.44	0.21
1500.00	0.70	170.42	1499.90	100.00	-9.68	9.73 S	7.00 W	11.98@	215.76	0.06
1600.00	0.81	178.75	1599.89	100.00	-10.99	11.03 S	6.89 W	13.01@	211.96	0.16
1700.00	1.29	208.92	1699.88	100.00	-12.68	12.73 S	7.41 W	14.73@	210.23	0.72
1800.00	1.62	226.27	1799.84	100.00	-14.63	14.69 S	8.98 W	17.22@	211.44	0.55
1900.00	1.68	233.25	1899.80	100.00	-16.47	16.54 S	11.18 W	19.96@	214.04	0.21
2000.00	0.79	235.24	1999.78	100.00	-17.73	17.81 S	12.92 W	22.00@	215.95	0.89
2100.00	0.62	235.04	2099.77	100.00	-18.43	18.52 S	13.93 W	23.17@	216.95	0.17
2200.00	0.60	240.00	2199.76	100.00	-18.99	19.09 S	14.82 W	24.17@	217.83	0.06
2300.00	0.42	237.52	2299.76	100.00	-19.45	19.55 S	15.59 W	25.00@	218.57	0.18
2400.00	0.33	245.37	2399.76	100.00	-19.76	19.86 S	16.16 W	25.60@	219.13	0.10

SUR: N-31-20s-35e, 330/S & 1980/W
BHL: C-31-20s-35e, 4949/S & 1943/W
API # 30-025-40103

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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	0.32	230.26	2499.76	100.00	-20.05	20.16 S	16.63 W	26.14@	219.52	0.09
2600.00	0.07	171.43	2599.76	100.00	-20.29	20.40 S	16.84 W	26.45@	219.54	0.29
2700.00	0.26	104.76	2699.76	100.00	-20.41	20.52 S	16.61 W	26.40@	218.99	0.24
2800.00	0.24	76.33	2799.75	100.00	-20.42	20.53 S	16.19 W	26.14@	218.26	0.12
2900.00	0.66	77.99	2899.75	100.00	-20.26	20.36 S	15.42 W	25.54@	217.14	0.42
3000.00	1.30	66.30	2999.74	100.00	-19.69	19.78 S	13.82 W	24.13@	214.94	0.67
3100.00	1.95	70.04	3099.70	100.00	-18.67	18.75 S	11.18 W	21.83@	210.82	0.66
3200.00	2.24	64.63	3199.63	100.00	-17.28	17.33 S	7.82 W	19.01@	204.28	0.35
3300.00	2.40	64.63	3299.55	100.00	-15.57	15.59 S	4.16 W	16.14@	194.93	0.16
3400.00	2.60	64.40	3399.45	100.00	-13.71	13.72 S	0.22 W	13.72@	180.92	0.20
3500.00	2.85	63.23	3499.34	100.00	-11.64	11.62 S	4.04 E	12.30@	160.80	0.26
3600.00	2.72	61.59	3599.22	100.00	-9.42	9.37 S	8.35 E	12.55@	138.28	0.15
3700.00	2.13	60.02	3699.13	100.00	-7.39	7.31 S	12.05 E	14.09@	121.25	0.59
3800.00	1.74	55.12	3799.07	100.00	-5.61	5.51 S	14.90 E	15.89@	110.30	0.42
3900.00	1.55	52.08	3899.03	100.00	-3.92	3.81 S	17.22 E	17.63@	102.49	0.21
4000.00	1.71	50.48	3998.99	100.00	-2.16	2.03 S	19.43 E	19.54@	95.97	0.17
4100.00	1.39	52.92	4098.95	100.00	-0.49	0.35 S	21.55 E	21.55@	90.94	0.33
4200.00	1.05	60.45	4198.93	100.00	0.68	0.83 N	23.32 E	23.33@	87.96	0.38
4300.00	0.97	66.71	4298.92	100.00	1.46	1.62 N	24.89 E	24.94@	86.28	0.14
4400.00	0.81	59.48	4398.90	100.00	2.14	2.31 N	26.28 E	26.38@	84.97	0.20
4500.00	0.63	53.82	4498.90	100.00	2.82	2.99 N	27.33 E	27.49@	83.75	0.19
4600.00	0.66	42.87	4598.89	100.00	3.56	3.74 N	28.17 E	28.41@	82.43	0.13
4700.00	1.30	30.15	4698.87	100.00	4.96	5.14 N	29.13 E	29.58@	79.98	0.67
4800.00	2.04	32.65	4798.83	100.00	7.43	7.62 N	30.66 E	31.59@	76.03	0.74
4900.00	2.64	28.62	4898.75	100.00	10.93	11.14 N	32.72 E	34.57@	71.19	0.62
5000.00	3.15	35.14	4998.62	100.00	15.18	15.41 N	35.41 E	38.61@	66.47	0.61
5100.00	3.37	36.41	5098.46	100.00	19.77	20.03 N	38.73 E	43.60@	62.66	0.23
5200.00	3.58	36.82	5198.27	100.00	24.62	24.89 N	42.35 E	49.12@	59.55	0.21

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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	3.31	34.87	5298.09	100.00	29.46	29.76 N	45.87 E	54.68@	57.03	0.30
5400.00	2.68	39.78	5397.96	100.00	33.61	33.92 N	49.01 E	59.61@	55.31	0.68
5500.00	2.55	42.10	5497.85	100.00	37.03	37.37 N	52.00 E	64.04@	54.30	0.17
5600.00	2.01	41.74	5597.77	100.00	39.98	40.33 N	54.66 E	67.93@	53.58	0.54
5700.00	1.80	39.89	5697.72	100.00	42.48	42.84 N	56.84 E	71.17@	52.99	0.22
5800.00	1.60	31.94	5797.67	100.00	44.85	45.23 N	58.58 E	74.01@	52.33	0.31
5900.00	1.20	48.86	5897.64	100.00	46.72	47.11 N	60.11 E	76.37@	51.91	0.57
6000.00	1.22	49.44	5997.62	100.00	48.09	48.49 N	61.71 E	78.48@	51.84	0.02
6100.00	1.21	54.11	6097.60	100.00	49.39	49.80 N	63.37 E	80.60@	51.84	0.10
6200.00	0.99	58.17	6197.58	100.00	50.45	50.87 N	64.96 E	82.51@	51.93	0.23
6300.00	0.97	51.93	6297.57	100.00	51.42	51.85 N	66.36 E	84.21@	52.00	0.11
6400.00	0.92	57.22	6397.55	100.00	52.37	52.81 N	67.70 E	85.86@	52.05	0.10
6500.00	1.06	53.34	6497.54	100.00	53.35	53.79 N	69.12 E	87.59@	52.11	0.16
6600.00	0.95	51.50	6597.52	100.00	54.41	54.86 N	70.51 E	89.34@	52.11	0.12
6700.00	0.93	59.83	6697.51	100.00	55.32	55.79 N	71.86 E	90.97@	52.18	0.14
6800.00	0.71	87.57	6797.50	100.00	55.75	56.22 N	73.18 E	92.28@	52.47	0.45
6900.00	0.70	90.40	6897.49	100.00	55.76	56.24 N	74.41 E	93.27@	52.92	0.04
7000.00	0.64	90.54	6997.49	100.00	55.74	56.23 N	75.58 E	94.20@	53.35	0.06
7100.00	0.48	119.23	7097.48	100.00	55.53	56.02 N	76.50 E	94.82@	53.78	0.32
7200.00	0.47	124.70	7197.48	100.00	55.09	55.59 N	77.21 E	95.13@	54.25	0.05
7300.00	0.70	164.23	7297.47	100.00	54.26	54.76 N	77.71 E	95.07@	54.83	0.45
7400.00	0.91	160.81	7397.46	100.00	52.92	53.43 N	78.14 E	94.66@	55.64	0.21
7500.00	1.40	177.40	7497.44	100.00	50.95	51.46 N	78.45 E	93.82@	56.74	0.59
7600.00	1.38	184.80	7597.41	100.00	48.53	49.04 N	78.41 E	92.48@	57.98	0.18
7700.00	1.40	202.78	7697.38	100.00	46.21	46.71 N	77.83 E	90.77@	59.03	0.43
7800.00	1.38	218.91	7797.35	100.00	44.15	44.65 N	76.60 E	88.66@	59.77	0.39
7900.00	1.32	235.43	7897.33	100.00	42.57	43.06 N	74.90 E	86.39@	60.11	0.39
8000.00	1.47	248.46	7997.30	100.00	41.46	41.93 N	72.76 E	83.98@	60.04	0.35

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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)
8100.00	1.42	251.44	8097.27	100.00	40.61	41.07 N	70.39 E	81.49@	59.74	0.09
8200.00	1.41	260.66	8197.23	100.00	40.03	40.47 N	68.00 E	79.13@	59.24	0.23
8300.00	1.37	259.47	8297.21	100.00	39.63	40.05 N	65.61 E	76.87@	58.60	0.05
8400.00	1.39	261.52	8397.18	100.00	39.25	39.66 N	63.24 E	74.64@	57.91	0.05
8500.00	1.39	260.71	8497.15	100.00	38.89	39.28 N	60.84 E	72.42@	57.15	0.02
8600.00	1.60	270.87	8597.11	100.00	38.73	39.11 N	58.25 E	70.16@	56.12	0.34
8700.00	1.72	271.92	8697.07	100.00	38.82	39.18 N	55.35 E	67.81@	54.71	0.12
8800.00	2.63	283.70	8797.00	100.00	39.44	39.77 N	51.62 E	65.17@	52.39	1.01
8900.00	3.84	289.31	8896.84	100.00	41.12	41.42 N	46.23 E	62.08@	48.14	1.25
9000.00	4.01	286.76	8996.60	100.00	43.28	43.54 N	39.73 E	58.94@	42.38	0.24
9100.00	4.33	286.80	9096.34	100.00	45.43	45.64 N	32.76 E	56.18@	35.67	0.32
9200.00	4.95	281.88	9196.01	100.00	47.46	47.62 N	24.93 E	53.75@	27.63	0.74
9300.00	4.96	281.33	9295.64	100.00	49.25	49.35 N	16.47 E	52.03@	18.45	0.05
9400.00	4.61	279.27	9395.29	100.00	50.80	50.85 N	8.26 E	51.52@	9.23	0.39
9500.00	4.11	275.62	9495.00	100.00	51.84	51.85 N	0.73 E	51.85@	0.81	0.57
9600.00	3.78	259.78	9594.77	100.00	51.65	51.62 N	6.08 W	51.97@	353.28	1.14
9700.00	3.50	246.13	9694.57	100.00	49.87	49.80 N	12.12 W	51.25@	346.32	0.91
9800.00	3.91	242.25	9794.36	100.00	47.09	46.97 N	17.93 W	50.28@	339.11	0.48
9900.00	3.65	243.53	9894.14	100.00	44.12	43.97 N	23.79 W	49.99@	331.58	0.27
10000.00	3.63	242.67	9993.94	100.00	41.28	41.09 N	29.45 W	50.56@	324.37	0.06
10100.00	3.69	246.34	10093.73	100.00	38.58	38.35 N	35.21 W	52.06@	317.44	0.24
** TIED-IN TO SCIENTIFIC DRILLING GYRO SURVEY @ 10150'MD.										
10150.00	4.00	244.39	10143.62	50.00	37.20	36.95 N	38.26 W	53.19@	314.00	0.67
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
10194.00	3.69	251.22	10187.52	44.00	36.09	35.83 N	40.98 W	54.44@	311.16	1.26
10225.00	5.63	323.13	10218.44	31.00	37.00	36.73 N	42.84 W	56.43@	310.60	18.35
10255.00	12.05	345.51	10248.08	30.00	41.23	40.94 N	44.51 W	60.48@	312.61	23.89
10286.00	16.88	342.82	10278.09	31.00	48.68	48.38 N	46.65 W	67.21@	316.04	15.73
10317.00	22.25	343.47	10307.28	31.00	58.63	58.31 N	49.65 W	76.59@	319.59	17.34

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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)
10348.00	25.32	344.41	10335.65	31.00	70.67	70.33 N	53.11 W	88.13@	322.94	9.98
10379.00	27.26	344.37	10363.44	31.00	83.92	83.55 N	56.80 W	101.03@	325.79	6.26
10410.00	30.42	343.78	10390.59	31.00	98.32	97.93 N	60.91 W	115.32@	328.12	10.24
10442.00	33.41	345.73	10417.75	32.00	114.67	114.25 N	65.34 W	131.61@	330.23	9.88
10472.00	36.05	349.71	10442.41	30.00	131.39	130.94 N	68.96 W	147.99@	332.23	11.60
10503.00	38.95	355.17	10467.01	31.00	150.09	149.64 N	71.41 W	165.80@	334.49	14.22
10534.00	41.59	359.10	10490.66	31.00	170.10	169.64 N	72.39 W	184.44@	336.89	11.82
10565.00	44.76	0.40	10513.27	31.00	191.31	190.85 N	72.47 W	204.15@	339.21	10.62
10596.00	47.57	0.17	10534.73	31.00	213.67	213.21 N	72.36 W	225.15@	341.25	9.08
10627.00	50.12	0.61	10555.13	31.00	237.01	236.54 N	72.20 W	247.32@	343.03	8.30
10657.00	53.20	1.76	10573.74	30.00	260.52	260.07 N	71.71 W	269.77@	344.58	10.70
10688.00	54.43	2.21	10592.04	31.00	285.52	285.07 N	70.84 W	293.74@	346.04	4.14
10719.00	53.55	0.88	10610.27	31.00	310.58	310.14 N	70.17 W	317.98@	347.25	4.48
10750.00	55.66	1.46	10628.22	31.00	335.84	335.40 N	69.65 W	342.56@	348.27	6.98
10781.00	59.27	1.55	10644.89	31.00	361.96	361.52 N	68.96 W	368.04@	349.20	11.65
10812.00	62.34	1.45	10660.01	31.00	389.00	388.57 N	68.25 W	394.52@	350.04	9.91
10842.00	64.72	1.11	10673.38	30.00	415.85	415.42 N	67.66 W	420.89@	350.75	8.00
10870.00	66.57	0.46	10684.93	28.00	441.35	440.92 N	67.31 W	446.03@	351.32	6.94
10901.00	67.88	359.59	10696.93	31.00	469.93	469.50 N	67.30 W	474.30@	351.84	4.95
10932.00	70.35	359.26	10707.98	31.00	498.89	498.46 N	67.59 W	503.03@	352.28	8.03
10963.00	72.11	359.28	10717.96	31.00	528.24	527.81 N	67.96 W	532.17@	352.66	5.68
10993.00	73.51	358.99	10726.82	30.00	556.90	556.47 N	68.39 W	560.65@	352.99	4.76
11024.00	75.71	358.24	10735.05	31.00	586.78	586.35 N	69.12 W	590.41@	353.28	7.47
11055.00	77.29	357.28	10742.29	31.00	616.91	616.46 N	70.30 W	620.46@	353.49	5.92
11086.00	78.08	357.04	10748.90	31.00	647.16	646.71 N	71.80 W	650.69@	353.67	2.66
11117.00	80.02	357.12	10754.79	31.00	677.57	677.11 N	73.35 W	681.07@	353.82	6.26
11147.00	81.16	357.33	10759.69	30.00	707.14	706.67 N	74.78 W	710.61@	353.96	3.86
11178.00	81.87	357.05	10764.26	31.00	737.77	737.29 N	76.28 W	741.23@	354.09	2.46

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11209.00	83.45	357.29	10768.22	31.00	768.49	768.00 N	77.80 W	771.93@	354.22	5.15
11240.00	84.68	357.71	10771.43	31.00	799.30	798.80 N	79.15 W	802.72@	354.34	4.19
11271.00	85.03	357.97	10774.21	31.00	830.16	829.66 N	80.31 W	833.54@	354.47	1.40
11302.00	86.88	358.13	10776.40	31.00	861.07	860.56 N	81.36 W	864.40@	354.60	5.99
11333.00	88.90	358.08	10777.54	31.00	892.03	891.52 N	82.39 W	895.32@	354.72	6.52
11363.00	89.52	357.66	10777.95	30.00	922.02	921.50 N	83.50 W	925.27@	354.82	2.50
11394.00	90.22	356.65	10778.02	31.00	952.99	952.46 N	85.04 W	956.25@	354.90	3.96
11425.00	90.92	356.73	10777.71	31.00	983.95	983.41 N	86.83 W	987.23@	354.95	2.27
11456.00	91.19	356.55	10777.14	31.00	1014.90	1014.35 N	88.65 W	1018.21@	355.01	1.05
11487.00	91.63	357.86	10776.38	31.00	1045.86	1045.30 N	90.16 W	1049.18@	355.07	4.46
11517.00	91.19	359.66	10775.64	30.00	1075.85	1075.28 N	90.81 W	1079.11@	355.17	6.18
11548.00	90.13	1.20	10775.28	31.00	1106.84	1106.28 N	90.57 W	1109.98@	355.32	6.03
11579.00	90.13	1.54	10775.21	31.00	1137.82	1137.27 N	89.83 W	1140.81@	355.48	1.10
11672.00	89.78	0.70	10775.29	93.00	1230.79	1230.25 N	88.01 W	1233.39@	355.91	0.98
11764.00	90.84	0.30	10774.79	92.00	1322.78	1322.24 N	87.21 W	1325.12@	356.23	1.23
11857.00	91.63	0.54	10772.79	93.00	1415.75	1415.22 N	86.53 W	1417.86@	356.50	0.89
11949.00	90.57	0.78	10771.02	92.00	1507.71	1507.19 N	85.47 W	1509.62@	356.75	1.18
12042.00	91.01	0.21	10769.74	93.00	1600.70	1600.18 N	84.67 W	1602.42@	356.97	0.77
12135.00	90.22	1.17	10768.74	93.00	1693.67	1693.17 N	83.55 W	1695.23@	357.18	1.34
12228.00	90.40	0.50	10768.24	93.00	1786.65	1786.16 N	82.19 W	1788.05@	357.37	0.75
12320.00	90.48	0.33	10767.53	92.00	1878.64	1878.15 N	81.53 W	1879.92@	357.51	0.20
12413.00	89.69	1.56	10767.39	93.00	1971.61	1971.14 N	79.99 W	1972.76@	357.68	1.57
12506.00	89.78	1.70	10767.82	93.00	2064.55	2064.10 N	77.35 W	2065.55@	357.85	0.18
12598.00	90.48	2.20	10767.61	92.00	2156.48	2156.04 N	74.22 W	2157.32@	358.03	0.93
12692.00	90.22	2.89	10767.04	94.00	2250.35	2249.95 N	70.04 W	2251.04@	358.22	0.78
12786.00	88.11	3.00	10768.41	94.00	2344.18	2343.81 N	65.21 W	2344.72@	358.41	2.25
12879.00	87.05	2.20	10772.33	93.00	2436.97	2436.63 N	61.00 W	2437.39@	358.57	1.43
12971.00	88.11	1.08	10776.22	92.00	2528.83	2528.50 N	58.37 W	2529.18@	358.68	1.67

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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)
13064.00	88.72	1.01	10778.79	93.00	2621.76	2621.45 N	56.67 W	2622.07@	358.76	0.66
13157.00	90.31	1.01	10779.58	93.00	2714.73	2714.43 N	55.03 W	2714.99@	358.84	1.71
13251.00	90.04	0.08	10779.29	94.00	2808.72	2808.43 N	54.14 W	2808.95@	358.90	1.03
13347.00	91.10	0.07	10778.34	96.00	2904.71	2904.42 N	54.01 W	2904.92@	358.93	1.10
13443.00	92.86	0.25	10775.02	96.00	3000.64	3000.36 N	53.75 W	3000.84@	358.97	1.84
13539.00	93.30	359.32	10769.86	96.00	3096.50	3096.22 N	54.11 W	3096.69@	359.00	1.07
13636.00	92.77	359.10	10764.73	97.00	3193.36	3193.07 N	55.44 W	3193.55@	359.01	0.59
13732.00	91.01	358.45	10761.56	96.00	3289.30	3288.99 N	57.49 W	3289.50@	359.00	1.95
13829.00	90.31	358.76	10760.44	97.00	3386.27	3385.96 N	59.85 W	3386.49@	358.99	0.79
13925.00	90.48	359.96	10759.78	96.00	3482.27	3481.95 N	60.93 W	3482.48@	359.00	1.26
14021.00	88.81	0.94	10760.38	96.00	3578.25	3577.94 N	60.17 W	3578.44@	359.04	2.02
14117.00	89.08	0.26	10762.14	96.00	3674.22	3673.92 N	59.17 W	3674.39@	359.08	0.76
14213.00	92.07	0.75	10761.18	96.00	3770.20	3769.90 N	58.32 W	3770.35@	359.11	3.16
14308.00	91.45	1.49	10758.26	95.00	3865.12	3864.83 N	56.47 W	3865.24@	359.16	1.02
14402.00	90.66	1.49	10756.53	94.00	3959.05	3958.78 N	54.02 W	3959.15@	359.22	0.84
14498.00	91.01	0.58	10755.13	96.00	4055.01	4054.76 N	52.29 W	4055.09@	359.26	1.02
14592.00	89.52	1.33	10754.70	94.00	4148.98	4148.74 N	50.72 W	4149.05@	359.30	1.77
14687.00	89.52	1.63	10755.49	95.00	4243.93	4243.71 N	48.27 W	4243.98@	359.35	0.32
14781.00	88.99	1.95	10756.72	94.00	4337.85	4337.65 N	45.33 W	4337.89@	359.40	0.66
14874.00	89.60	1.80	10757.86	93.00	4430.77	4430.59 N	42.29 W	4430.80@	359.45	0.68
15015.00	90.04	1.58	10758.30	141.00	4571.68	4571.53 N	38.13 W	4571.69@	359.52	0.35
STRAIGHT LINE PROJECTION TO BIT @ 15062'MD.										
15062.00	90.04	1.58	10758.27	47.00	4618.65	4618.51 N	36.83 W	4618.66@	359.54	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.