

Results of Directional Survey

API number:	30-005-29105		
OGRID:		Operator:	MACK ENERGY CORP
		Property:	SAM FEDERAL # 4 H

surface	ULSTR:	E	28	T 15S	R 30E
				2285 FNL	380 FWL

BH Loc	ULSTR:	H	28	T 15S	R 30E
13091 MD		9042.6	TVD	2273 FNL	4967 FWL

Top Perf/OH	ULSTR:	E	28	T 15S	R 30E
9376 MD		8796.6	TVD	2282 FNL	1262 FWL

Bot Perf/OH	ULSTR:	H	28	T 15S	R 30E
12891 MD		9026.8	TVD	2276 FNL	4768 FWL

	MD	N/S	E/W	VD
	9363	3.13	868.65	8796.58
TOP PERFS/OH	9376	3.27	881.65	8796.58
	9393	3.45	898.65	8796.58
	12882	9.03	4379.10	9026.08
BOT PERFS/OH	12891	9.28	4388.07	9026.81
	12913	9.88	4409.99	9028.60

NEXT TO LAST	13007	11.68	4503.64	9036.39
LAST READING	13035	11.90	4531.57	9038.45
TD	13091	12.34	4587.43	9042.57

Surface Location	2285 FN	380 FW
Projected BHL	2273 FN	4967 FW
Location of		
Top Perfs/OH	2282 FN	1262 FW
Bottom Perfs/OH	2276 FN	4768 FW

SUMMARY of Subsurface Locations

Surface Location	E-28-15S-30E	2285 FN	380 FW	Vert. Depth
Top Perfs/OH	E-28-15S-30E	2282 FN	1262 FW	8796.58
Bottom Perfs/OH	H-28-15S-30E	2276 FN	4768 FW	9026.81
Projected TD	H-28-15S-30E	2273 FN	4967 FW	9042.57



PO Box 1370
Artesia, NM 88211-1370
(505) 748-1288

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August 20, 2010

Mack Energy Corporation
PO Box 960
Artesia, NM 88211-0960

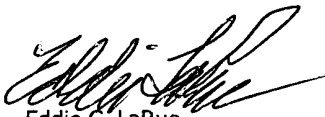
RE: Sam Federal #4
2285' FNL & 330' FWL
Sec. 28, T15S, R30E
Chaves County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

SUR: E-28-15s-30e, 2285/N & 380/W
BHL: H-28-15s-30e, 2273/N & 4967/W
API # 30-005-29105

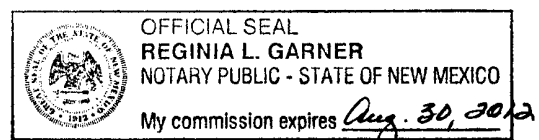
Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 20th day of August, 2010.


Regina L. Garner
Notary Public



Pason DataHub Deviation Survey
Well Dossier 1278629637 - Sams Fed #4 - Re-entry
#

# Date	Depth	Deviation	Direction	TVD
7/9/2010	544	0.00	0.00	0.00
7/9/2010	703	0.30	24.80	0.00
7/10/2010	911	0.50	80.30	0.00
7/10/2010	1065	1.20	85.60	0.00
7/10/2010	1441	1.80	72.70	0.00
7/10/2010	1625	1.40	81.60	0.00
7/10/2010	1779	1.20	68.70	0.00
7/10/2010	1964	0.90	64.30	0.00
7/10/2010	2150	0.30	65.10	0.00
7/11/2010	2367	0.40	18.00	0.00
7/11/2010	2555	0.40	21.40	0.00
7/11/2010	2742	0.30	281.70	0.00
7/11/2010	2929	0.80	268.90	0.00
7/11/2010	3084	0.90	288.40	0.00
7/11/2010	3240	0.80	289.50	0.00
7/11/2010	3394	0.90	278.90	0.00
7/12/2010	3921	0.60	327.20	3971.00
7/13/2010	4176	0.40	321.90	4227.00
7/14/2010	4367	0.40	256.50	0.00
7/14/2010	4552	0.30	312.30	4601.00
7/14/2010	4675	0.40	264.10	4725.00
7/14/2010	4863	0.90	287.90	0.00
7/15/2010	5049	0.70	284.70	5099.00
7/15/2010	5237	0.70	275.50	0.00
7/16/2010	5425	1.00	251.60	5472.00
7/16/2010	5611	0.80	261.30	5659.00
7/17/2010	5611	1.20	251.60	0.00
7/18/2010	5904	1.14	250.99	5950.00
7/18/2010	5997	1.30	277.20	6043.00
7/18/2010	6090	1.49	274.46	6136.00
7/18/2010	6184	1.41	267.95	6183.32
7/18/2010	6277	0.35	304.60	6276.30
7/18/2010	6371	0.53	229.81	6370.30
7/19/2010	6464	1.06	161.64	4643.00
7/19/2010	6558	0.97	157.91	6557.00
7/19/2010	6684	0.97	168.11	6683.26
7/19/2010	6776	1.14	168.89	6775.25
7/19/2010	6869	1.06	155.72	6868.23
7/19/2010	6963	0.70	157.74	6962.22
7/20/2010	7056	0.70	135.50	7055.00
7/20/2010	7149	0.97	159.37	7148.00
7/20/2010	7274	1.06	136.29	7273.18
7/20/2010	7367	0.88	139.46	7366.17
7/20/2010	7461	0.62	161.61	7460.16
7/21/2010	7554	0.35	187.71	7553.16
7/21/2010	7647	0.44	167.36	7646.16
7/21/2010	7741	0.70	178.83	7740.15
7/21/2010	7834	0.62	186.13	7833.14
7/22/2010	7927	0.09	305.13	7926.14
7/22/2010	8020	0.09	295.64	8019.14

Pason DataHub Deviation Survey
 # Well Dossier 1278629637 - Sams Fed #4 - Re-entry
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# Date	Depth	Deviation	Direction	TVD
7/23/2010	8114	0.70	57.46	8113.14
7/23/2010	8208	0.79	48.49	8207.13
7/24/2010	8394	0.44	44.98	8393.12
7/24/2010	8550	0.35	35.48	8549.12
7/25/2010	8738	0.35	81.77	8737.00
7/29/2010	8160	2.99	73.01	8159.11
7/30/2010	8191	5.98	78.37	8190.02
7/30/2010	8223	9.88	84.53	8221.70
7/30/2010	8254	13.81	88.39	8252.00
7/30/2010	8285	17.06	90.50	8281.92
7/30/2010	8316	20.05	91.56	8311.30
8/1/2010	8397	25.63	90.29	8385.89
8/1/2010	8430	28.74	90.60	8415.24
8/1/2010	8461	31.85	90.58	8442.10
8/1/2010	8492	35.07	90.45	8467.86
8/1/2010	8523	38.53	89.96	8492.68
8/1/2010	8554	40.32	89.42	8516.63
8/2/2010	8585	41.80	90.74	8642.00
8/2/2010	8617	43.81	89.95	8563.48
8/2/2010	8648	47.22	89.90	8585.20
8/2/2010	8679	50.67	89.56	8605.56
8/2/2010	8709	51.70	89.98	8624.36
8/2/2010	8740	52.72	90.50	8643.36
8/2/2010	8771	53.96	90.60	8661.86
8/2/2010	8802	56.73	90.35	8679.49
8/3/2010	8833	59.33	90.19	8695.90
8/3/2010	8896	63.06	90.72	8726.14
8/3/2010	8958	69.91	89.45	8750.93
8/3/2010	8989	73.60	88.75	8760.64
8/3/2010	9020	75.99	88.06	8768.77
8/3/2010	9051	78.56	87.74	8775.60
8/4/2010	9082	81.46	88.20	8780.00
8/4/2010	9114	84.84	89.50	8784.00
8/4/2010	9176	86.81	90.44	8790.57
8/4/2010	9207	87.54	90.29	8790.21
8/4/2010	9238	87.48	90.39	8791.55
8/4/2010	9269	87.26	90.34	8792.98
8/4/2010	9300	87.82	89.45	8794.37
8/4/2010	9331	87.99	89.48	8795.44
8/4/2010	9363	87.93	89.23	8796.58
8/4/2010	9425	88.04	89.26	8798.82
8/5/2010	9487	86.76	89.81	8801.00
8/5/2010	9518	86.98	90.00	0.00
8/5/2010	9549	87.26	89.87	8805.00
8/5/2010	9580	86.81	90.32	8806.00
8/5/2010	9642	86.48	90.55	8810.29
8/5/2010	9798	86.36	90.31	8819.79
8/5/2010	9861	85.69	89.97	8823.91
8/5/2010	9892	85.35	89.77	8826.33
8/5/2010	9923	85.46	89.93	8828.82

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#	Date	Depth	Deviation	Direction	TVD
	8/6/2010	9954	85.58	89.96	8831.24
	8/6/2010	10016	85.63	89.23	8836.00
	8/6/2010	10047	86.36	89.22	8838.17
	8/6/2010	10079	86.53	89.29	8840.15
	8/6/2010	10110	86.53	89.29	8842.03
	8/6/2010	10141	86.70	89.33	8843.86
	8/6/2010	10172	86.25	89.21	8845.76
	8/6/2010	10234	86.08	89.39	8849.69
	8/6/2010	10265	86.02	89.38	8851.82
	8/6/2010	10296	85.74	89.19	8854.05
	8/6/2010	10328	85.18	88.99	8856.58
	8/6/2010	10390	86.31	88.97	8864.14
	8/6/2010	19359	85.19	89.09	8863.96
	8/7/2010	10421	86.92	89.27	8863.29
	8/7/2010	10452	88.21	89.31	8864.60
	8/7/2010	10483	88.99	89.22	8865.66
	8/7/2010	10515	89.33	89.43	0.00
	8/7/2010	10546	89.27	89.65	8866.20
	8/7/2010	10577	89.38	89.47	8866.57
	8/7/2010	10608	88.66	89.81	8867.13
	8/7/2010	10670	87.76	90.02	8868.91
	8/7/2010	10701	87.14	89.73	8870.29
	8/7/2010	10733	87.37	89.70	8871.82
	8/7/2010	10764	87.54	89.72	8873.20
	8/7/2010	10795	87.42	89.57	8874.57
	8/7/2010	10826	87.37	89.67	8875.97
	8/7/2010	10857	87.26	89.43	8877.43
	8/7/2010	10888	87.14	89.49	8878.94
	8/8/2010	1104	87.59	89.85	8886.51
	8/8/2010	10920	87.14	89.61	8880.54
	8/8/2010	10951	87.09	89.45	8882.10
	8/8/2010	10982	87.20	89.48	8883.64
	8/8/2010	11013	87.31	89.74	8885.13
	8/9/2010	11108	87.87	90.88	8888.93
	8/9/2010	11139	87.82	91.20	8890.10
	8/9/2010	11169	86.75	90.99	8891.52
	8/10/2010	11200	86.30	90.51	8893.00
	8/10/2010	11232	85.24	91.00	8895.00
	8/10/2010	11263	84.38	91.02	8898.00
	8/10/2010	11294	84.39	91.51	8901.00
	8/10/2010	11325	84.95	91.64	8904.63
	8/10/2010	11451	84.50	91.18	8916.62
	8/10/2010	11482	85.18	91.68	8919.41
	8/10/2010	11513	84.99	90.83	8922.09
	8/10/2010	11544	84.73	90.36	8924.36
	8/10/2010	11575	84.84	89.63	8927.71
	8/10/2010	11606	85.18	88.86	8930.41
	8/10/2010	11636	85.41	89.14	8932.87
	8/10/2010	11667	85.46	89.16	8935.33
	8/10/2010	11685	85.40	89.38	8937.80

Pason DataHub Deviation Survey
Well Dossier 1278629637 - Sams Fed #4 - Re-entry
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# Date	Depth	Deviation	Direction	TVD
8/10/2010	11729	85.23	89.24	8940.34
8/11/2010	11760	85.12	89.38	8942.94
8/11/2010	11792	85.18	89.33	8945.65
8/11/2010	11823	85.18	89.21	8948.25
8/11/2010	11854	85.01	89.19	8950.90
8/11/2010	11886	84.67	89.57	8953.78
8/11/2010	11917	84.45	89.60	8956.72
8/11/2010	11948	84.36	89.52	8959.75
8/11/2010	11979	84.51	89.44	8962.76
8/11/2010	12010	84.90	89.28	8965.62
8/11/2010	12041	85.35	89.60	8968.26
8/11/2010	12072	85.30	89.87	8970.76
8/14/2010	12104	85.47	89.74	8973.00
8/14/2010	12135	86.14	90.20	8975.00
8/14/2010	12259	86.92	91.40	8983.24
8/14/2010	12291	86.87	90.81	8984.98
8/14/2010	12322	87.20	90.52	8986.58
8/14/2010	12353	86.36	90.16	8988.32
8/14/2010	12384	86.08	90.22	8990.37
8/14/2010	12415	85.68	90.59	8992.59
8/14/2010	12446	85.35	91.03	8995.07
8/14/2010	12477	85.58	91.02	8997.47
8/14/2010	12508	85.69	91.59	8999.83
8/14/2010	12540	85.63	90.41	9002.25
8/14/2010	12571	85.51	89.96	9004.64
8/15/2010	12820	86.08	88.63	9021.66
8/15/2010	12851	85.88	88.35	9023.75
8/15/2010	12882	85.63	88.51	9026.07
8/15/2010	12913	85.07	88.33	9028.50
8/15/2010	12944	84.96	88.76	9031.28
8/15/2010	12976	85.46	89.09	9033.95
8/15/2010	13007	85.57	89.38	9036.37

EOF



An Operating Unit of Smith International, Inc.

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DIRECTIONAL SURVEY REPORT

MACK ENERGY

SAM FEDERAL #4H

LEA COUNTY, NEW MEXICO

SUR: E-28-15s-30e, 2285/N & 380/W
BHL: H-28-15s-30e, 2273/N & 4967/W
API # 30-005-29105

PREPARED BY: FRANCISCO SINISTERRA

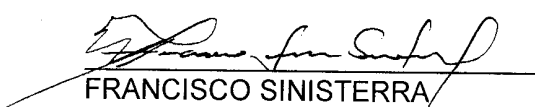
Pathfinder Energy Services, Inc.
6213 W. Interstate 20 • Midland, TX • 79706
(432) 681-6000

DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) NICK POND
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 07-17-10 TO 08-15-10
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: LEA COUNTY, NM
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

MACK ENERGY
SAM FEDERAL #4H
LEA COUNTY, NM
RIG: SILVER OAK #7
9. SURVEY CERTIFIED FROM: 5904 TO 13035 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 4587.44 FEET ON A BEARING OF 89.85 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 13091 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.


FRANCISCO SINISTERRA
M/LWD SERVICE COORDINATOR

PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 07/17/2010
Date Completed: 08/15/2010

MACK ENERGY CORPORATION
SAM FEDERAL #4H
CHAVES COUNTY, NM
Rig: Silver Oak #7
PathFinder Office Supervisor: Francisco Sinisterra
PathFinder Field Engineers: Steve Bibb
Nick Pond
Robert Gutshall

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.59.16.1137 N LON: 103.56.13.2208 W
GRID Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 621524.5000 Y: 723306.5000
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.71° EAST TO GRID
Vertical Section Plane: 89.73
Survey Vert. Reference: 18.00' Rotary Table To Ground
Altitude: 3987.00' Ground To MSL

Measured Depth	13091.00	(feet)
Inclination	85.97	(deg)
Azimuth	89.70	(deg)
True Vertical Depth	9042.39	(feet)
Vertical Section	4587.43	(feet)
Survey X cord	626111.93	(feet)
Survey Y cord	723318.70	(feet)
Survey Lat	32.98779450 N	(deg)
Survey Lon	103.92204499 W	(deg)
Rectangular Corr. N/S	12.20 N	(feet)
Rectangular Corr. E/W	4587.43 E	(feet)
Closure Distance	4587.44	(feet)
Direction of Closure	89.85	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION

SAM FEDERAL #4H

CHAVES COUNTY, NM

Rig: Silver Oak #7

PathFinder Office Supervisor: Francisco Sinisterra

PathFinder Field Engineers: Steve Bibb

Nick Pond

Robert Gutshall

Brian McManus

Survey Calculations by RX5 V6.03A using Minimum Curvature

Page 01/08

Tie-in Date: 07/17/2010

Date Completed: 08/15/2010

Survey Horiz. Reference: WELLHEAD

Ref Coordinates: LAT: 32.59.16.1137 N LON: 103.56.13.2208 W

GRID Reference: NAD27 new mexico east Transverse Mercator

Ref GRID Coord: X: 621524.5000 Y: 723306.5000

North Aligned To: GRID NORTH

Total Magnetic Correction: 7.71° EAST TO GRID

Vertical Section Plane: 89.73

Survey Vert. Reference: 18.00' Rotary Table To Ground

Altitude: 3987.00' Ground To MSL

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular (ft)	Offsets (ft)	Closure Dist (ft)	Dir (deg)	DLS (dg/100ft)
THE FOLLOWING ARE NAVIGATE ENERGY SERVICES MWD SURVEYS.										
703.00	0.30	24.80	702.99	0.00	0.78	1.67 N	0.77 E	1.84@	24.70	0.00
911.00	0.50	80.30	910.99	208.00	1.90	2.32 N	1.89 E	3.00@	39.20	0.20
1065.00	1.20	85.60	1064.97	154.00	4.18	2.56 N	4.16 E	4.89@	58.43	0.46
1290.00	2.00	77.30	1289.88	225.00	10.36	3.60 N	10.34 E	10.95@	70.80	0.37
1441.00	1.80	72.70	1440.80	151.00	15.20	4.89 N	15.18 E	15.94@	72.15	0.17
1625.00	1.40	81.60	1624.73	184.00	20.19	6.07 N	20.16 E	21.06@	73.23	0.25
1779.00	1.20	68.70	1778.69	154.00	23.56	6.93 N	23.52 E	24.52@	73.57	0.23
1964.00	0.90	64.30	1963.66	185.00	26.68	8.27 N	26.64 E	27.89@	72.76	0.17
2150.00	0.30	65.10	2149.65	186.00	28.44	9.11 N	28.40 E	29.82@	72.22	0.32
2367.00	0.40	18.00	2366.64	217.00	29.19	10.07 N	29.14 E	30.83@	70.95	0.14
2555.00	0.40	21.40	2554.64	188.00	29.64	11.30 N	29.59 E	31.67@	69.09	0.01
2742.00	0.30	281.70	2741.64	187.00	29.40	12.01 N	29.35 E	31.71@	67.74	0.29
2929.00	0.80	268.90	2928.63	187.00	27.62	12.08 N	27.56 E	30.09@	66.33	0.27
3084.00	0.90	288.40	3083.61	155.00	25.38	12.45 N	25.32 E	28.22@	63.83	0.20
3240.00	0.80	289.50	3239.59	156.00	23.20	13.20 N	23.14 E	26.63@	60.30	0.06
3394.00	0.90	278.90	3393.58	154.00	20.99	13.74 N	20.93 E	25.04@	56.71	0.12
3580.00	0.40	299.70	3579.56	186.00	18.99	14.29 N	18.92 E	23.71@	52.94	0.29
3769.00	0.50	302.10	3768.56	189.00	17.72	15.06 N	17.65 E	23.20@	49.53	0.05
3921.00	0.60	327.20	3920.55	152.00	16.73	16.08 N	16.66 E	23.15@	46.01</	

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
SAM FEDERAL #4H
CHAVES COUNTY, NM
RIG: Silver Oak #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)
5049.00	0.70	284.70	5048.50	186.00	8.22	19.74 N	8.12 E	21.35@	22.37	0.11
5237.00	0.70	275.50	5236.49	188.00	5.97	20.14 N	5.87 E	20.98@	16.25	0.06
5425.00	1.00	251.60	5424.47	188.00	3.26	19.73 N	3.17 E	19.99@	9.13	0.24
5611.00	0.80	261.30	5610.44	186.00	0.44	19.03 N	0.35 E	19.03@	1.05	0.13
** TIE INTO NAVIGATE ENERGY SERVICES MWD SURVEY @ 5830' MD.										
5830.00	1.20	251.60	5829.41	219.00	-3.25	18.07 N	3.34 W	18.38@	349.53	0.20
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
5904.00	1.14	250.99	5903.39	74.00	-4.69	17.59 N	4.77 W	18.22@	344.82	0.08
5997.00	1.32	277.18	5996.37	93.00	-6.63	17.42 N	6.71 W	18.67@	338.94	0.63
6090.00	1.49	274.46	6089.35	93.00	-8.89	17.65 N	8.98 W	19.80@	333.04	0.20
6184.00	1.41	267.95	6183.32	94.00	-11.27	17.70 N	11.35 W	21.03@	327.33	0.19
6277.00	0.35	304.60	6276.30	93.00	-12.64	17.82 N	12.73 W	21.90@	324.46	1.23
6371.00	0.53	229.81	6370.30	94.00	-13.21	17.70 N	13.30 W	22.14@	323.09	0.59
6464.00	1.06	161.69	6463.29	93.00	-13.28	16.61 N	13.36 W	21.31@	321.20	1.07
6558.00	0.97	157.91	6557.28	94.00	-12.71	15.05 N	12.78 W	19.74@	319.65	0.12
6684.00	0.97	168.11	6683.26	126.00	-12.10	13.01 N	12.16 W	17.81@	316.94	0.14
6776.00	1.14	168.99	6775.25	92.00	-11.77	11.35 N	11.83 W	16.39@	313.83	0.19
6869.00	1.06	155.72	6868.23	93.00	-11.25	9.66 N	11.30 W	14.86@	310.54	0.29
6963.00	0.70	157.74	6962.22	94.00	-10.68	8.34 N	10.72 W	13.58@	307.87	0.38
7056.00	0.70	135.50	7055.21	93.00	-10.07	7.41 N	10.11 W	12.53@	306.23	0.29
7149.00	0.97	159.32	7148.20	93.00	-9.40	6.26 N	9.43 W	11.32@	303.59	0.47
7274.00	1.06	136.29	7273.18	125.00	-8.24	4.44 N	8.26 W	9.38@	298.26	0.33
7367.00	0.88	139.46	7366.17	93.00	-7.19	3.27 N	7.20 W	7.91@	294.45	0.20
7461.00	0.62	161.61	7460.16	94.00	-6.56	2.24 N	6.57 W	6.94@	288.85	0.41
7554.00	0.35	187.71	7553.16	93.00	-6.44	1.48 N	6.45 W	6.62@	282.96	0.37
7647.00	0.44	163.36	7646.16	93.00	-6.38	0.86 N	6.39 W	6.44@	277.67	0.20
7741.00	0.70	178.83	7740.15	94.00	-6.27	0.06 S	6.27 W	6.27@	269.46	0.32
7834.00	0.62	186.13	7833.14	93.00	-6.32	1.13 S	6.31 W	6.41@	259.87	0.12
7927.00	0.09	305.13	7926.14	93.00	-6.43					

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
SAM FEDERAL #4H
CHAVES COUNTY, NM
RIG:Silver Oak #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)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
8114.00	0.70	57.46	8113.14	94.00	-6.14	1.17 S	6.13 W	6.25@	259.19	0.80
8160.00	2.99	73.01	8159.11	46.00	-4.75	0.67 S	4.75 W	4.80@	261.98	5.05
8191.00	5.98	78.37	8190.02	31.00	-2.40	0.11 S	2.40 W	2.40@	267.42	9.73
8223.00	9.85	84.53	8221.70	32.00	1.97	0.49 N	1.96 E	2.02@	76.01	12.36
8254.00	13.81	88.39	8252.04	31.00	8.31	0.85 N	8.30 E	8.35@	84.18	13.02
8285.00	17.06	90.50	8281.92	31.00	16.56	0.91 N	16.55 E	16.58@	86.85	10.64
8316.00	20.05	91.56	8311.30	31.00	26.42	0.73 N	26.41 E	26.42@	88.43	9.71
8338.00	21.81	91.21	8331.85	22.00	34.27	0.54 N	34.27 E	34.27@	89.10	8.02
8368.00	23.59	90.29	8359.53	30.00	45.85	0.39 N	45.85 E	45.85@	89.51	6.05
8397.00	25.63	90.29	8385.89	29.00	57.92	0.33 N	57.92 E	57.92@	89.68	7.03
8430.00	28.74	90.60	8415.24	33.00	73.00	0.21 N	73.00 E	73.00@	89.84	9.43
8461.00	31.85	90.58	8442.01	31.00	88.63	0.05 N	88.63 E	88.63@	89.97	10.03
8492.00	35.07	90.48	8467.86	31.00	105.72	0.11 S	105.72 E	105.72@	90.06	10.39
8523.00	38.53	89.96	8492.68	31.00	124.28	0.18 S	124.29 E	124.29@	90.08	11.21
8554.00	40.32	89.42	8516.63	31.00	143.97	0.07 S	143.97 E	143.97@	90.03	5.88
8585.00	41.80	89.74	8540.00	31.00	164.33	0.08 N	164.33 E	164.33@	89.97	4.82
8617.00	43.81	89.95	8563.48	32.00	186.08	0.14 N	186.08 E	186.08@	89.96	6.30
8648.00	47.22	89.90	8585.20	31.00	208.19	0.17 N	208.19 E	208.19@	89.95	11.00
8679.00	50.67	89.56	8605.56	31.00	231.56	0.28 N	231.56 E	231.56@	89.93	11.16
8709.00	51.70	89.98	8624.36	30.00	254.94	0.37 N	254.94 E	254.94@	89.92	3.60
8740.00	52.72	90.50	8643.36	31.00	279.43	0.27 N	279.43 E	279.43@	89.94	3.55
8771.00	53.96	90.60	8661.86	31.00	304.30	0.03 N	304.30 E	304.30@	89.99	4.01
8802.00	56.73	90.35	8679.49	31.00	329.79	0.18 S	329.80 E	329.80@	90.03	8.96
8833.00	59.33	90.19	8695.90	31.00	356.09	0.30 S	356.09 E	356.09@	90.05	8.40
8865.00	61.53	90.34	8711.69	32.00	383.92	0.43 S	383.92 E	383.92@	90.06	6.89
8896.00	63.06	90.72	8726.11	31.00	411.36	0.69 S	411.37 E	411.37@	90.10	5.05
8927.00	66.27	90.19	8739.37	31.00	439.37	0.91 S	439.38 E	439.38@	90.12	10.47
8958.00	69.91	89.45	8750.94	31.00	468.13	0.82 S	468.14 E	468.14@	90.10	11.95
8989.00										

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
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CHAVES COUNTY, NM
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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)
9051.00	78.56	87.74	8775.60	31.00	557.69	1.59 N	557.69 E	557.69@	89.84	8.35
9082.00	81.46	88.20	8780.97	31.00	588.20	2.67 N	588.19 E	588.20@	89.74	9.47
9114.00	84.84	89.50	8784.79	32.00	619.96	3.31 N	619.95 E	619.96@	89.69	11.31
9145.00	86.98	90.59	8787.00	31.00	650.88	3.28 N	650.87 E	650.88@	89.71	7.74
9176.00	86.81	90.44	8788.68	31.00	681.83	3.00 N	681.83 E	681.83@	89.75	0.73
9207.00	87.54	90.29	8790.21	31.00	712.79	2.81 N	712.79 E	712.79@	89.77	2.40
9238.00	87.48	90.39	8791.55	31.00	743.76	2.62 N	743.76 E	743.76@	89.80	0.38
9269.00	87.26	90.34	8792.98	31.00	774.73	2.43 N	774.72 E	774.73@	89.82	0.73
9300.00	87.82	89.45	8794.31	31.00	805.70	2.48 N	805.69 E	805.70@	89.82	3.39
9331.00	87.99	89.48	8795.44	31.00	836.68	2.77 N	836.67 E	836.68@	89.81	0.56
9363.00	87.93	89.23	8796.58	32.00	868.65	3.13 N	868.65 E	868.66@	89.79	0.80
9393.00	87.87	89.56	8797.68	30.00	898.63	3.45 N	898.63 E	898.63@	89.78	1.12
9425.00	88.04	89.26	8798.82	32.00	930.61	3.78 N	930.61 E	930.61@	89.77	1.08
9456.00	87.09	89.78	8800.14	31.00	961.58	4.04 N	961.58 E	961.58@	89.76	3.49
9487.00	86.76	89.81	8801.80	31.00	992.54	4.15 N	992.53 E	992.54@	89.76	1.07
9518.00	86.98	90.00	8803.49	31.00	1023.49	4.20 N	1023.49 E	1023.49@	89.76	0.94
9549.00	87.26	89.87	8805.05	31.00	1054.45	4.23 N	1054.45 E	1054.45@	89.77	1.00
9580.00	86.81	90.32	8806.66	31.00	1085.41	4.18 N	1085.40 E	1085.41@	89.78	2.05
9611.00	86.64	90.51	8808.43	31.00	1116.36	3.96 N	1116.35 E	1116.36@	89.80	0.82
9642.00	86.48	90.55	8810.29	31.00	1147.30	3.67 N	1147.30 E	1147.30@	89.82	0.53
9674.00	86.64	90.84	8812.21	32.00	1179.24	3.29 N	1179.24 E	1179.24@	89.84	1.03
9705.00	86.81	90.90	8813.98	31.00	1210.18	2.82 N	1210.18 E	1210.18@	89.87	0.58
9736.00	86.31	90.62	8815.84	31.00	1241.12	2.41 N	1241.12 E	1241.13@	89.89	1.85
9767.00	86.36	90.51	8817.82	31.00	1272.05	2.10 N	1272.06 E	1272.06@	89.91	0.39
9798.00	86.36	90.31	8819.79	31.00	1302.99	1.88 N	1302.99 E	1303.00@	89.92	0.64
9829.00	86.48	90.19	8821.72	31.00	1333.93	1.74 N	1333.93 E	1333.93@	89.93	0.55
9861.00	85.69	89.97	8823.91	32.00	1365.85	1.70 N	1365.86 E	1365.86@	89.93	2.56
9892.00										

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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)
9985.00	85.58	89.83	8833.62	31.00	1489.47	1.94 N	1489.48 E	1489.48@	89.93	0.42
10016.00	85.63	89.73	8836.00	31.00	1520.38	2.06 N	1520.39 E	1520.39@	89.92	0.36
10047.00	86.36	89.22	8838.16	31.00	1551.30	2.34 N	1551.31 E	1551.31@	89.91	2.87
10079.00	86.53	89.29	8840.15	32.00	1583.24	2.75 N	1583.24 E	1583.25@	89.90	0.57
10110.00	86.53	89.29	8842.02	31.00	1614.18	3.14 N	1614.19 E	1614.19@	89.89	0.00
10141.00	86.70	89.33	8843.86	31.00	1645.13	3.51 N	1645.13 E	1645.13@	89.88	0.56
10172.00	86.25	89.21	8845.76	31.00	1676.07	3.90 N	1676.07 E	1676.07@	89.87	1.50
10203.00	86.58	89.08	8847.70	31.00	1707.00	4.37 N	1707.00 E	1707.01@	89.85	1.14
10234.00	86.08	89.39	8849.68	31.00	1737.94	4.78 N	1737.94 E	1737.94@	89.84	1.90
10265.00	86.02	89.38	8851.82	31.00	1768.87	5.11 N	1768.86 E	1768.87@	89.83	0.20
10296.00	85.74	89.18	8854.05	31.00	1799.78	5.50 N	1799.78 E	1799.79@	89.82	1.11
10328.00	85.18	88.99	8856.58	32.00	1831.68	6.01 N	1831.67 E	1831.68@	89.81	1.85
10359.00	85.19	89.09	8859.18	31.00	1862.57	6.53 N	1862.56 E	1862.57@	89.80	0.32
10390.00	86.31	88.97	8861.48	31.00	1893.48	7.05 N	1893.47 E	1893.48@	89.79	3.63
10421.00	86.92	89.27	8863.31	31.00	1924.43	7.52 N	1924.41 E	1924.43@	89.78	2.19
10452.00	88.21	89.31	8864.63	31.00	1955.40	7.91 N	1955.38 E	1955.40@	89.77	4.16
10483.00	88.99	89.22	8865.38	31.00	1986.39	8.31 N	1986.37 E	1986.39@	89.76	2.53
10515.00	89.33	89.43	8865.85	32.00	2018.38	8.68 N	2018.36 E	2018.38@	89.75	1.25
10546.00	89.27	89.65	8866.23	31.00	2049.38	8.93 N	2049.36 E	2049.38@	89.75	0.74
10577.00	89.38	89.47	8866.60	31.00	2080.38	9.17 N	2080.36 E	2080.38@	89.75	0.68
10608.00	88.66	89.81	8867.13	31.00	2111.37	9.36 N	2111.35 E	2111.37@	89.75	2.57
10639.00	88.49	89.41	8867.90	31.00	2142.36	9.58 N	2142.34 E	2142.36@	89.74	1.40
10670.00	87.76	90.02	8868.91	31.00	2173.35	9.73 N	2173.32 E	2173.35@	89.74	3.07
10701.00	87.14	89.73	8870.29	31.00	2204.31	9.80 N	2204.29 E	2204.31@	89.75	2.21
10733.00	87.37	89.70	8871.82	32.00	2236.28	9.96 N	2236.26 E	2236.28@	89.74	0.72
10764.00	87.54	89.72	8873.20	31.00	2267.25	10.11 N	2267.23 E	2267.25@	89.74	0.55

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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)
10920.00	87.14	89.61	8880.54	32.00	2423.07	11.30 N	2423.05 E	2423.07@	89.73	0.38
10951.00	87.09	89.45	8882.10	31.00	2454.03	11.55 N	2454.01 E	2454.03@	89.73	0.54
10982.00	87.20	89.48	8883.64	31.00	2485.00	11.84 N	2484.97 E	2485.00@	89.73	0.37
11013.00	87.31	89.74	8885.13	31.00	2515.96	12.05 N	2515.93 E	2515.96@	89.73	0.91
11044.00	87.59	89.85	8886.50	31.00	2546.93	12.16 N	2546.90 E	2546.93@	89.73	0.97
11077.00	87.93	90.67	8887.79	33.00	2579.90	12.01 N	2579.87 E	2579.90@	89.73	2.69
11108.00	87.87	90.88	8888.93	31.00	2610.88	11.59 N	2610.85 E	2610.88@	89.75	0.70
11139.00	87.82	91.20	8890.10	31.00	2641.85	11.03 N	2641.82 E	2641.85@	89.76	1.04
11169.00	86.75	90.99	8891.52	30.00	2671.80	10.46 N	2671.78 E	2671.80@	89.78	3.63
11200.00	86.30	90.51	8893.40	31.00	2702.74	10.05 N	2702.72 E	2702.74@	89.79	2.12
11232.00	85.24	91.00	8895.76	32.00	2734.65	9.63 N	2734.63 E	2734.65@	89.80	3.65
11263.00	84.34	91.02	8898.57	31.00	2765.51	9.09 N	2765.50 E	2765.52@	89.81	2.90
11294.00	84.39	91.51	8901.61	31.00	2796.35	8.41 N	2796.34 E	2796.36@	89.83	1.58
11325.00	84.45	91.64	8904.63	31.00	2827.19	7.56 N	2827.18 E	2827.19@	89.85	0.46
11357.00	84.45	91.51	8907.72	32.00	2859.02	6.68 N	2859.02 E	2859.03@	89.87	0.41
11388.00	84.67	91.56	8910.66	31.00	2889.87	5.86 N	2889.87 E	2889.88@	89.88	0.73
11419.00	84.56	91.54	8913.57	31.00	2920.71	5.02 N	2920.72 E	2920.73@	89.90	0.36
11451.00	84.50	91.18	8916.62	32.00	2952.56	4.27 N	2952.57 E	2952.57@	89.92	1.14
11482.00	85.18	91.68	8919.41	31.00	2983.42	3.50 N	2983.43 E	2983.44@	89.93	2.72
11513.00	84.90	90.89	8922.09	31.00	3014.29	2.80 N	3014.31 E	3014.31@	89.95	2.69
11544.00	84.73	90.36	8924.89	31.00	3045.16	2.47 N	3045.18 E	3045.18@	89.95	1.79
11575.00	84.84	89.63	8927.71	31.00	3076.03	2.47 N	3076.05 E	3076.05@	89.95	2.37
11606.00	85.18	88.86	8930.41	31.00	3106.91	2.88 N	3106.93 E	3106.93@	89.95	2.71
11636.00	85.41	89.14	8932.87	30.00	3136.81	3.40 N	3136.83 E	3136.83@	89.94	1.20
11667.00	85.46	89.16	8935.33	31.00	3167.71	3.86 N	3167.72 E	3167.73@	89.93	0.17
11698.00	85.40	89.38	8937.80	31.00	3198.61	4.25 N	3198.62 E	3198.63@	89.92	0.73
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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)
11854.00	85.01	89.19	8950.91	31.00	3354.05	6.18 N	3354.06 E	3354.06@	89.89	0.55
11886.00	84.67	89.57	8953.78	32.00	3385.92	6.52 N	3385.93 E	3385.93@	89.89	1.59
11917.00	84.45	89.60	8956.72	31.00	3416.78	6.75 N	3416.79 E	3416.79@	89.89	0.72
11948.00	84.34	89.52	8959.75	31.00	3447.63	6.98 N	3447.64 E	3447.65@	89.88	0.44
11979.00	84.51	89.44	8962.76	31.00	3478.49	7.26 N	3478.49 E	3478.50@	89.88	0.61
12010.00	84.90	89.28	8965.62	31.00	3509.35	7.61 N	3509.36 E	3509.36@	89.88	1.36
12041.00	85.35	89.60	8968.26	31.00	3540.24	7.91 N	3540.24 E	3540.25@	89.87	1.78
12072.00	85.30	89.87	8970.78	31.00	3571.14	8.05 N	3571.14 E	3571.15@	89.87	0.88
12104.00	85.47	89.74	8973.36	32.00	3603.03	8.16 N	3603.03 E	3603.04@	89.87	0.67
12135.00	86.14	90.20	8975.63	31.00	3633.95	8.18 N	3633.95 E	3633.96@	89.87	2.62
12166.00	86.36	90.55	8977.65	31.00	3664.88	7.97 N	3664.88 E	3664.89@	89.88	1.33
12197.00	86.41	90.79	8979.61	31.00	3695.81	7.61 N	3695.82 E	3695.83@	89.88	0.79
12228.00	86.59	91.30	8981.50	31.00	3726.75	7.05 N	3726.76 E	3726.76@	89.89	1.74
12259.00	86.92	91.40	8983.25	31.00	3757.69	6.32 N	3757.70 E	3757.70@	89.90	1.11
12291.00	86.87	90.81	8984.99	32.00	3789.63	5.70 N	3789.65 E	3789.65@	89.91	1.85
12322.00	87.20	90.52	8986.59	31.00	3820.59	5.34 N	3820.60 E	3820.61@	89.92	1.42
12353.00	86.36	90.16	8988.33	31.00	3851.53	5.16 N	3851.55 E	3851.56@	89.92	2.95
12384.00	86.08	90.22	8990.38	31.00	3882.47	5.06 N	3882.48 E	3882.49@	89.93	0.92
12415.00	85.68	90.59	8992.60	31.00	3913.38	4.84 N	3913.40 E	3913.41@	89.93	1.76
12446.00	85.35	91.03	8995.03	31.00	3944.28	4.40 N	3944.31 E	3944.31@	89.94	1.77
12477.00	85.58	91.02	8997.48	31.00	3975.18	3.85 N	3975.20 E	3975.21@	89.94	0.74
12508.00	85.69	91.59	8999.84	31.00	4006.08	3.15 N	4006.11 E	4006.11@	89.96	1.87
12540.00	85.63	90.41	9002.26	32.00	4037.98	2.59 N	4038.01 E	4038.01@	89.96	3.68
12571.00	85.51	89.96	9004.65	31.00	4068.88	2.49 N	4068.92 E	4068.92@	89.96	1.50
12602.00	86.02	89.40	9006.94	31.00	4099.80	2.66 N	4099.83 E	4099.83@	89.96	2.44
12633.00	86.02	88.53								

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
SAM FEDERAL #4H
CHAVES COUNTY, NM
RIG:Silver Oak #7

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets		Closure Dist Dir		DLS
						(ft)	(ft)	(ft)	(deg)	(dg/100ft)
12789.00	86.41	88.76	9019.54	31.00	4286.34	6.67 N	4286.36 E	4286.37@	89.91	0.70
12820.00	86.08	88.63	9021.57	31.00	4317.27	7.37 N	4317.29 E	4317.29@	89.90	1.14
12851.00	85.80	88.35	9023.77	31.00	4348.19	8.19 N	4348.20 E	4348.21@	89.89	1.27
12882.00	85.63	88.51	9026.08	31.00	4379.09	9.03 N	4379.10 E	4379.11@	89.88	0.75
12913.00	85.07	88.33	9028.60	31.00	4409.98	9.88 N	4409.99 E	4410.00@	89.87	1.90
12944.00	84.96	88.76	9031.29	31.00	4440.86	10.67 N	4440.86 E	4440.87@	89.86	1.43
12976.00	85.46	89.09	9033.96	32.00	4472.74	11.27 N	4472.74 E	4472.75@	89.86	1.87
13007.00	85.57	89.38	9036.39	31.00	4503.65	11.68 N	4503.64 E	4503.66@	89.85	1.00
13035.00	85.97	89.70	9038.45	28.00	4531.57	11.90 N	4531.57 E	4531.58@	89.85	1.83
STRAIGHT LINE PROJECTION TO BIT @ 13091' MD.										
13091.00	85.97	89.70	9042.39	56.00	4587.43	12.20 N	4587.43 E	4587.44@	89.85	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.

FINDER

ENERGY SERVICES

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	MACK ENERGY		
LEASE / WELL No.:	SAM FEDERAL	#4H	
WELL LOCATION:	LEA COUNTY, NM		
COUNTY / STATE / COUNTRY:	LEA	NEW MEXICO	USA
RIG:	SILVER OAK #7		
API WELL No:	30-005-29105		
JOB No:	101010113 WT-WT		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	PATHFINDER ENERGY		

WELL SITE INFORMATION

MAGNETIC DECLINATION:			
On Wall Plat:	7.7	LWD Calculated:	7.71
		Agreed Upon:	7.71
X =	621524.500000	Feet	Y = 723306.500000
			Feet
SITE LATITUDE:	32.987809 N	SITE LONGITUDE:	103.937006
GRID SYSTEM:	TRUE ☐ UTM ☒	LAMBERT ☐	ZONE: NEW MEXICO EAST
PROPOSED DRIFT DIRECTION:	89.73		
KELLY BUSHING ELEVATION:	18		
ALTITUDE:	3987	Feet	WATER DEPTH: N/A
			Feet

TIE-IN SURVEY

MEASURED DEPTH:	5830		
DRIFT ANGLE:	1.2		
DRIFT DIRECTION:	251.6		
TRUE VERTICAL DEPTH:	5829.41		
VERTICAL SECTION:	18.07		
RECTANGULAR COORDINATE (N / S) :	18.07		
RECTANGULAR COORDINATE (E / W) :	-3.34		
CLOSURE DISTANCE / DIRECTION:	18.37	349.53	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	NAVIGATE ENERGY SERVICES		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	8331	TOTAL DEPTH:	13195
KICKOFF ANGLE:	0	MAX ANGLE:	87.37

PES Engineers: _____

**Signature of both field engineers required if applicable

Directional Driller: _____

DATE: _____



SWD SURVEY REPORT

Job Number : WNM-2073-S

Report Date : JULY 7,2010

Operator : MACK ENERGIES

Lease / Well : SAM FEDERAL #4

Location : EDDY CO,NM

Field :

Contractor / Rig : SILVER OAK 7

Directional Company :

MWD Field Rep. : Brandon Ramirez

Tie In Survey Reference : Surface

Calculation Method : MINIMUM CURVATURE

API Number : N/A

Target +N / -S = 0.0'

Target +E / -W = 0.0'

Target TVD = 9300.0'

Magnetic Declination +E / -W = 7.93°

Grid Convergence +E / -W = 0.22°

Total Correction +E / -W = 7.71°

North Reference = Grid

RKB Height = 19.00'

Ground Level Elevation = 1337'

Vertical Section Azimuth = 0.00°

Comments :

SURVEY #0 = TIE IN SURVEY

SURVEY #30= STRAIGHT LINE PROJECTED SURVEY TO BOTTOM HOLE DEPTH

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
0	0.00'	0.00°	0.00°		0.00'	0.00'	0.00'	0.00'			
1	703.00'	0.30°	24.80°	703'	703.00'	1.67'	1.67'	0.77'	1.84'	24.80°	0.04°
2	911.00'	0.50°	80.30°	208'	910.99'	2.32'	2.32'	1.89'	2.99'	39.27°	0.20°
3	1065.00'	1.20°	85.60°	154'	1064.97'	2.55'	2.55'	4.17'	4.89'	58.48°	0.46°
4	1290.00'	2.00°	77.30°	225'	1289.89'	3.60'	3.60'	10.34'	10.95'	70.82°	0.37°
5	1441.00'	1.80°	72.70°	151'	1440.80'	4.88'	4.88'	15.18'	15.95'	72.17°	0.17°
6	1625.00'	1.40°	81.60°	184'	1624.73'	6.07'	6.07'	20.16'	21.06'	73.24°	0.26°
7	1779.00'	1.20°	68.70°	154'	1778.69'	6.93'	6.93'	23.53'	24.53'	73.58°	0.23°
8	1964.00'	0.90°	64.30°	185'	1963.66'	8.27'	8.27'	26.64'	27.89'	72.76°	0.17°
9	2150.00'	0.30°	65.10°	186'	2149.65'	9.10'	9.10'	28.40'	29.82'	72.22°	0.32°
10	2367.00'	0.40°	18.00°	217'	2366.64'	10.06'	10.06'	29.15'	30.84'	70.95°	0.14°
11	2555.00'	0.40°	21.40°	188'	2554.64'	11.30'	11.30'	29.59'	31.67'	69.10°	0.01°
12	2742.00'	0.30°	281.70°	187'	2741.64'	12.01'	12.01'	29.35'	31.71'	67.75°	0.29°
13	2929.00'	0.80°	268.90°	187'	2928.63'	12.08'	12.08'	27.56'	30.09'	66.33°	0.27°
14	3084.00'	0.90°	288.40°	155'	3083.61'	12.44'					

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
26	5237.00'	0.70°	275.50°	188'	5236.49'	20.14'	20.14'	5.87'	20.98'	16.26°	0.06°
27	5425.00'	1.00°	251.60°	188'	5424.47'	19.73'	19.73'	3.17'	19.98'	9.14°	0.24°
28	5611.00'	0.80°	261.30°	186'	5610.45'	19.02'	19.02'	0.35'	19.03'	1.05°	0.13°
29	5830.00'	1.20°	251.60°	219'	5829.41'	18.07'	18.07'	-3.34'	18.37'	349.53°	0.20°
30	5877.00'	1.20°	251.60°	47'	5876.40'	17.76'	17.76'	-4.27'	18.26'	346.47°	0.00°

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

MACK ENERGY
SAM FEDERAL #4H
CHAVES COUNTY, NEW MEXICO
Rig:SILVER OAK #7

Fri Jul 09 09:30:25 2010

Coordinates

Latitude: 32.987809 N (32 deg. 59 min. 16.1137 sec.)
Longitude: 103.937006 W (-103 deg. 56 min. 13.2208 sec.)
Elevation: 4005.00 feet.
Calculation Date: Jul/09/2010

Magnetic Calculations

Model: IGRF2010
Dip Angle: 60.8522 degrees
Total Magnetic Field: 0.49125 gauss
Magnetic Declination: 7.927609 degrees
Horizontal Intensity: 0.239271 gauss

To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.927609 Degs

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 621524.5000 feet
Y: 723306.5000 feet
True to Grid: (convergence) -0.215787 degrees
Magnetic to Grid: 7.711822 degrees

To Convert a Magnetic Dir. to a GRID dir. Add 7.711822 Degs.