



30.015.36563

DIRECTIONAL SURVEY REPORT

MARBOB ENERGY

LOCO FEDERAL #5

EDDY COUNTY, NEW MEXICO

PREPARED BY: FRANCISCO SINISTERRA

Pathfinder Energy Services, Inc.
6213 W. County Road 112 • 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) KYLE TABOR
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 10/31/08 TO 11/09/08
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: EDDY COUNTY, NM
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

MARBOB ENERGY
LOCO FEDERAL #5
EDDY COUNTY, NM
RIG: PERMIAN #4
9. SURVEY CERTIFIED FROM: 2,589 TO 6,004 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 188.32 FEET ON A BEARING OF 101.46 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 6,100 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: 10/31/2008
Date Completed: 11/09/2008

MARBOB ENERGY CORP.
LOCO FED # 5
EDDY COUNTY, NM
Rig:PERMIAN 4
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers:DAVID ASHER

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.49.34.5225 N LON:103.58.32.5080 W
GRID Reference:NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 609860.1000 Y: 664489.0000
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.93° EAST TO GRID
Vertical Section Plane: 103.05
Survey Vert. Reference: 0.00' Kelly Bushing To Ground
Altitude:3672.00' Ground To MSL

Measured Depth	6100.00	(feet)
Inclination	0.62	(deg)
Azimuth	344.84	(deg)
True Vertical Depth	6088.61	(feet)
Vertical Section	188.25	(feet)
Survey X cord	610044.66	(feet)
Survey Y cord	664451.59	(feet)
Survey Lat	32.82615168 N	(deg)
Survey Lon	103.97509626 W	(deg)
Rectangular Corr. N/S	37.41 S	(feet)
Rectangular Corr. E/W	184.56 E	(feet)
Closure Distance	188.32	(feet)
Direction of Closure	101.46	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

MARBOB ENERGY CORP.

LOCO FED # 5

EDDY COUNTY, NM

Rig:PERMIAN 4

PathFinder Office Supervisor: FRANCISCO SINISTERRA

PathFinder Field Engineers: DAVID ASHER

Survey Horiz. Reference:WELLHEAD

Ref Coordinates: LAT:32.49.34.5225 N LON:103.58.32.5080 W

Reference:NAD27 new mexico east Transverse Mercator

Ref GRID Coord: X: 609860.1000 Y: 664489.0000

North Aligned To:GRID NORTH

Total Magnetic Correction: 7.93° EAST TO GRID

Vertical Section Plane: 103.05

Survey Vert. Reference: 0.00' Kelly Bushing To Ground

Altitude:3672.00' Ground To MSL

Survey Calculations by RX5 V5.11i 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)
TIE IN TO SCIENTIFIC GYRO SURVEY @ 2522' MD.										
2522.00	2.83	339.17	2520.83	0.00	-21.55	44.44 N	11.82 W	45.99@	345.11	0.00
THE FOLLOWING ARE PATHFINDER ENERGY SERVICES MWD SURVEYS.										
2589.00	1.85	351.11	2587.77	67.00	-22.88	47.05 N	12.58 W	48.71@	345.04	1.63
2652.00	1.76	349.86	2650.74	63.00	-23.64	49.01 N	12.90 W	50.68@	345.25	0.16
2715.00	1.85	350.21	2713.71	63.00	-24.41	50.97 N	13.25 W	52.66@	345.43	0.14
2778.00	1.49	30.60	2776.69	63.00	-24.56	52.67 N	13.00 W	54.25@	346.13	1.91
2872.00	2.46	78.65	2870.64	94.00	-22.35	54.12 N	10.40 W	55.11@	349.12	1.95
2965.00	2.73	100.44	2963.54	93.00	-18.32	54.11 N	6.27 W	54.48@	353.39	1.09
3059.00	2.99	108.83	3057.43	94.00	-13.65	52.92 N	1.74 W	52.95@	358.11	0.52
3154.00	2.02	79.59	3152.34	95.00	-9.65	52.42 N	2.25 E	52.47@	2.45	1.66
3218.00	3.17	94.71	3216.27	64.00	-6.86	52.48 N	5.12 E	52.73@	5.57	2.08
3283.00	4.48	109.89	3281.13	65.00	-2.56	51.47 N	9.30 E	52.30@	10.24	2.53
3346.00	5.89	117.09	3343.87	63.00	3.02	49.16 N	14.49 E	51.25@	16.42	2.46
3444.00	7.30	118.91	3441.22	98.00	13.88	43.86 N	24.42 E	50.20@	29.11	1.45
3535.00	7.56	120.78	3531.45	91.00	25.15	38.00 N	34.62 E	51.41@	42.34	0.39
3628.00	8.00	115.94	3623.60	93.00	37.28	32.04 N	45.70 E	55.81@	54.97	0.85
3724.00	8.18	117.75	3718.64	96.00	50.40	25.94 N	57.75 E	63.31@	65.82	0.32
3819.00	7.12	117.44	3812.80	95.00	62.64	20.08 N	68.96 E	71.82@	73.77	1.12
3883.00	7.30	117.08	3876.29	64.00	70.43	16.40 N	76.10 E	77.84@	77.84	0.29
3978.00	5.63	122.54	3970.68	95.00	80.68	11.14 N	85.40 E	86.12@	82.57	1.87
4073.00	5.63	127.42	4065.23	95.00	89.32	5.80 N	93.03 E	93.21@	86.43	0.50
4137.00	5.19	114.97	4128.94	64.00	95.01	2.67 N	98.15 E	98.18@	88.44	1.95
4231.00	5.63	108.77	4222.52	94.00	103.76	0.60 S	106.37 E	106.37@	90.33	0.78

PathFinder Energy Services, Inc.

Survey Report

MARBOB ENERGY CORP.
 LOCO FED # 5
 EDDY COUNTY, NM
 RIG:PERMIAN 4

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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)
4326.00	5.10	116.54	4317.11	95.00	112.50	3.99 S	114.56 E	114.63@	92.00	0.95
4421.00	5.28	120.31	4411.72	95.00	120.78	8.08 S	122.11 E	122.37@	93.79	0.41
4516.00	5.01	127.95	4506.34	95.00	128.72	12.84 S	129.15 E	129.79@	95.68	0.77
4611.00	3.69	116.97	4601.06	95.00	135.45	16.78 S	135.15 E	136.19@	97.08	1.64
4706.00	3.34	118.43	4695.89	95.00	141.08	19.48 S	140.31 E	141.65@	97.91	0.38
4770.00	3.52	116.14	4759.77	64.00	144.79	21.24 S	143.71 E	145.27@	98.41	0.35
4865.00	3.43	122.07	4854.60	95.00	150.32	24.03 S	148.74 E	150.66@	99.18	0.39
4960.00	3.34	114.71	4949.43	95.00	155.72	26.69 S	153.66 E	155.96@	99.86	0.47
5055.00	3.25	115.70	5044.27	95.00	161.06	29.02 S	158.60 E	161.23@	100.37	0.11
5165.00	3.34	116.37	5154.09	110.00	167.22	31.79 S	164.28 E	167.33@	100.95	0.09
5245.00	3.34	117.90	5233.96	80.00	171.74	33.92 S	168.43 E	171.81@	101.39	0.11
5340.00	2.37	113.02	5328.84	95.00	176.35	35.98 S	172.68 E	176.39@	101.77	1.05
5436.00	2.02	106.95	5424.77	96.00	179.99	37.25 S	176.13 E	180.02@	101.94	0.44
5531.00	1.93	105.93	5519.71	95.00	183.26	38.18 S	179.27 E	183.29@	102.02	0.10
5625.00	1.41	124.28	5613.67	94.00	185.92	39.27 S	181.74 E	185.94@	102.19	0.79
5720.00	1.41	117.07	5708.64	95.00	188.14	40.46 S	183.75 E	188.15@	102.42	0.19
5815.00	0.62	22.87	5803.63	95.00	189.36	40.51 S	184.99 E	189.37@	102.35	1.66
5909.00	0.70	349.15	5897.63	94.00	189.22	39.48 S	185.08 E	189.24@	102.04	0.42
6004.00	0.62	344.84	5992.62	95.00	188.74	38.42 S	184.84 E	188.79@	101.74	0.10
STRAIGHT LINE PROJECTION TO BIT @ 6100' MD.										
6100.00	0.62	344.84	6088.61	96.00	188.25	37.41 S	184.56 E	188.32@	101.46	0.00

FINDER

ENERGY SERVICES

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	MARBOB ENERGY CORP.		
LEASE / WELL No.:	LOCO FEDERAL	# 5	
WELL LOCATION:	EDDY COUNTY		
COUNTY / STATE / COUNTRY:	EDDY	NM	U.S.A
RIG:	PERMIAN # 4		
API WELL No:	30-015-36563		
JOB No:	101008005WT-WT		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	PATHFINDER ENERGY SERVICES		

WELL SITE INFORMATION

MAGNETIC DECLINATION:			
On Wall Plat:	7.93	LWD Calculated:	7.926802
		Agreed Upon:	7.926802
X =	609860.100000	Feet	Y = 664489.000000
			Feet
SITE LATITUDE:	32.826256 N	SITE LONGITUDE:	103.975697 W
GRID SYSTEM:	TRUE ☐ UTM ☐ LAMBERT ☒ ZONE:		
PROPOSED DRIFT DIRECTION:	103.05		
KELLY BUSHING ELEVATION:	18		
ALTITUDE:	3672'	Feet	WATER DEPTH: 0
			Feet

TIE-IN SURVEY

MEASURED DEPTH:	2522		
DRIFT ANGLE:	2.83		
DRIFT DIRECTION:	339.17		
TRUE VERTICAL DEPTH:	2520.83		
VERTICAL SECTION:	-21.55		
RECTANGULAR COORDINATE (N / S) :	44.44		
RECTANGULAR COORDINATE (E / W) :	-11.82		
CLOSURE DISTANCE / DIRECTION:	45.99	345.11	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	SCIENTIFIC DRILLING CONTROLS		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	3200	TOTAL DEPTH:	6040
KICKOFF ANGLE:	1	MAX ANGLE:	8

PES Engineers:

Phil P. Arch

**Signature of both field engineers required if applicable

Directional Driller:

Chris Chapin

DATE: 31-Oct-2008

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

MARBOB ENERGY
LOCO FEDERAL #5
EDDY COUNTY, NEW MEXICO
Rig:PERMIAN 4

Thu Oct 30 10:12:49 2008

Coordinates

Latitude: 32.826256 N (32 deg. 49 min. 34.5225 sec.)
Longitude: 103.975697 W (-103 deg. 58 min. 32.5080 sec.)
Elevation: 3672.00 feet.
Calculation Date: Oct/30/2008

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.7531 degrees
Total Magnetic Field: 0.49221 gauss
Magnetic Declination: 8.120676 degrees
Horizontal Intensity: 0.240483 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 8.120676 Degr

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 609860.1000 feet
Y: 664489.0000 feet
True to Grid: (convergence) -0.193874 degrees
Magnetic to Grid: 7.926802 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 7.926802 Degr.

S C I E N T I F I C D R I L L I N G C O N T R O L S

KEEPER GYRO SURVEY
Directional Survey Report
for

MARBOB

Well Number	:	LOCO FED NO. 5
Well Location	:	EDDY COUNTY, NEW MEXICO
Job Number	:	32K1008859
Location Latitude	:	32.827
Survey Date	:	31-OCT-2008
S.D.C. Personnel	:	ANGEL GUEBARA
Length Units	:	Feet
North Reference	:	GRID North
Grid Correction	:	-2.42 Degrees
Survey Depth Zero	:	RKB
Proposal Direction	:	
Calculation Method	:	Minimum Curvature

Remarks : The INRUN Survey will be called definitive

S C I E N T I F I C D R I L L I N G C O N T R O L S

Inrun Survey
for
MARBOB

Page 1

Well No.: LOCO FED NO.5

Date : 31-OCT-2008

Job No. : 32K1008859

Proposal : 0.00

Depth	T.V.D.	V.S.	Inc	GRID	Azimuth	Latitude	Departure	0-leg
(Feet)	(Feet)	(Feet)	Deg.	Deg.	(Feet)	(Feet)	(Feet)	/100

0.00	0.00	0.00	0.00	357.58	0.00	0.00	0.00
100.00	100.00	-0.42	0.65	137.52	-0.42	0.38	0.65
200.00	199.99	-1.25	0.65	136.31	-1.25	1.16	0.01
300.00	299.99	-2.07	0.63	139.12	-2.07	1.91	0.04
400.00	399.98	-2.54	0.78	265.81	-2.54	1.59	1.26
500.00	499.97	-2.69	0.77	260.92	-2.69	0.25	0.07
600.00	599.96	-3.17	0.75	235.82	-3.17	-0.96	0.33
700.00	699.96	-3.74	0.55	244.32	-3.74	-1.93	0.22
800.00	799.95	-4.10	0.24	224.57	-4.10	-2.51	0.33
900.00	899.95	-4.07	0.37	55.12	-4.07	-2.39	0.61
1000.00	999.95	-3.77	0.51	76.06	-3.77	-1.70	0.21
1100.00	1099.95	-3.49	0.47	65.18	-3.49	-0.89	0.10
1200.00	1199.94	-2.99	0.49	40.06	-2.99	-0.24	0.21
1300.00	1299.94	-2.41	0.40	43.19	-2.41	0.27	0.09
1400.00	1399.94	-1.60	0.64	354.84	-1.60	0.46	0.48
1500.00	1499.92	0.10	1.41	339.29	0.10	-0.03	0.81
1600.00	1599.88	2.71	1.78	339.55	2.71	-1.00	0.37
1700.00	1699.83	5.85	1.99	345.42	5.85	-1.98	0.28
1800.00	1799.75	9.54	2.36	348.01	9.54	-2.85	0.38
1900.00	1899.64	14.18	3.04	351.51	14.18	-3.67	0.70
2000.00	1999.49	19.66	3.33	349.91	19.66	-4.57	0.30
2100.00	2099.33	25.24	3.18	348.62	25.24	-5.62	0.17
2200.00	2199.18	30.45	2.93	347.41	30.45	-6.73	0.26
2300.00	2299.05	35.37	2.88	344.76	35.37	-7.95	0.14
2400.00	2398.96	39.47	2.21	330.18	39.47	-9.56	0.93
2500.00	2498.86	43.43	2.82	338.39	43.43	-11.43	0.71
2522.00	2520.83	44.44	2.83	339.17	44.44	-11.82	0.18

The Horizontal Displacement (in Feet) at
Measured Depth 2522.00 is 45.98 in a Direction of 345.10 Degrees