



An Operating Unit of Smith International, Inc.

30 015 36318

DIRECTIONAL SURVEY REPORT

MACK ENERGY

LOBOS FEDERAL #1

EDDY COUNTY, NEW MEXICO

PREPARED BY: FRANCISCO SINISTERRA

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

Mr

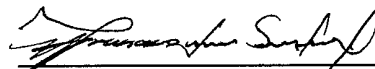
DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) JAY FULTON
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 11/10/09 TO 11/16/09
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:

MACK ENERGY
LOBOS FEDERAL #1
EDDY COUNTY, NM
RIG: SILVEROAK # 2

9. SURVEY CERTIFIED FROM: 1404 TO 5179 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 439.71 FEET ON A BEARING OF 233.11 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 5227 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: 11/10/2009
Date Completed: 11/16/2009

MACK ENERGY CORPORATION
LOBOS FEDERAL #1
EDDY COUNTY, NM
Rig:SILVER OAK #2
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers:RAFAEL DONARUMMA
JAY FULTON

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.46.15.9320 N LON:104.17.5.7264 W
GRID Reference:NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 514879.7000 Y: 644237.7000
North Aligned To:GRID NORTH
Total Magnetic Correction: 8.11° EAST TO GRID
Vertical Section Plane: 232.90
Survey Vert. Reference: 17.00' Kelly Bushing To Ground
Altitude:3572.00' Ground To MSL

Measured Depth	5227.00	(feet)
Inclination	6.60	(deg)
Azimuth	237.61	(deg)
True Vertical Depth	5201.64	(feet)
Vertical Section	439.71	(feet)
Survey X cord	514528.03	(feet)
Survey Y cord	643973.74	(feet)
Survey Lat	32.77036710 N	(deg)
Survey Lon	104.28606848 W	(deg)
Rectangular Corr. N/S	263.96 S	(feet)
Rectangular Corr. E/W	351.67 W	(feet)
Closure Distance	439.71	(feet)
Direction of Closure	233.11	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
LOBOS FEDERAL #1
EDDY COUNTY, NM
Rig:SILVER OAK #2
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Survey Vert. Reference: 17.00' Kelly Bushing To Ground
Altitude:3572.00' 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 (ft)	Dir (deg)	DLS (dg/100ft)
TIE IN TO SCIENTIFIC GRYO @ 1251.60' MD.										
1251.60	1.00	156.10	1251.56	0.00	7.96	5.84 S	5.56 W	8.06@	223.59	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
1404.00	0.97	180.99	1403.94	152.40	9.06	8.35 S	5.04 W	9.75@	211.15	0.28
1436.00	0.97	184.11	1435.93	32.00	9.40	8.89 S	5.07 W	10.23@	209.69	0.17
1468.00	1.32	213.25	1467.93	32.00	9.93	9.47 S	5.29 W	10.84@	209.20	2.09
1500.00	2.11	232.15	1499.91	32.00	10.86	10.13 S	5.96 W	11.76@	210.44	3.00
1531.00	2.64	234.66	1530.89	31.00	12.15	10.90 S	6.99 W	12.95@	212.67	1.74
1563.00	2.90	235.79	1562.85	32.00	13.69	11.78 S	8.26 W	14.39@	215.04	0.83
1595.00	3.25	236.95	1594.80	32.00	15.41	12.73 S	9.69 W	16.00@	217.28	1.11
1627.00	3.52	234.42	1626.75	32.00	17.29	13.80 S	11.25 W	17.80@	219.19	0.96
1658.00	4.04	229.99	1657.68	31.00	19.34	15.05 S	12.86 W	19.80@	220.51	1.92
1690.00	4.66	228.10	1689.59	32.00	21.76	16.64 S	14.69 W	22.20@	221.43	1.99
1753.00	5.89	234.10	1752.32	63.00	27.54	20.25 S	19.21 W	27.91@	223.50	2.14
1816.00	6.24	233.69	1814.97	63.00	34.19	24.17 S	24.59 W	34.48@	225.49	0.56
1880.00	6.24	235.03	1878.59	64.00	41.15	28.22 S	30.24 W	41.37@	226.98	0.23
1943.00	6.42	236.47	1941.20	63.00	48.08	32.13 S	35.99 W	48.24@	228.24	0.38
2039.00	6.42	236.82	2036.60	96.00	58.80	38.03 S	44.95 W	58.88@	229.77	0.04
2134.00	6.51	237.14	2131.00	95.00	69.47	43.86 S	53.92 W	69.51@	230.87	0.10
2229.00	6.60	237.12	2225.38	95.00	80.28	49.75 S	63.03 W	80.30@	231.72	0.09
2325.00	6.86	239.22	2320.72	96.00	91.48	55.68 S	72.59 W	91.48@	232.51	0.37
2420.00	6.95	234.22	2415.03	95.00	102.87	61.94 S	82.13 W	102.87@	232.98	0.64
2515.00	7.30	233.89	2509.29	95.00	114.65	68.86 S	91.67 W	114.65@	233.09	0.37
2610.00	6.77	236.02	2603.58	95.00	126.27	75.55 S	101.18 W	126.28@	233.25	0.62
2705.00	6.77	234.96	2697.92	95.00	137.46	81.89 S	110.41 W	137.47@	233.44	0.13
2801.00	6.68	236.24	2793.25	96.00	148.69	88.24 S	119.69 W	148.70@	233.60	0.18
2902.00	6.68	232.26	2893.57	101.00	160.43	95.10 S	129.22 W	160.44@	233.65	0.46

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORPORATION
LOBOS FEDERAL #1
EDDY COUNTY, NM
RIG:SILVER OAK #2

Page 02/02

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)
2997.00	6.60	234.31	2987.93	95.00	171.41	101.67 S	138.02 W	171.42@	233.62	0.26
3093.00	6.68	228.53	3083.29	96.00	182.49	108.59 S	146.68 W	182.50@	233.49	0.70
3188.00	6.68	230.11	3177.65	95.00	193.52	115.79 S	155.06 W	193.53@	233.25	0.19
3283.00	6.33	230.62	3272.03	95.00	204.27	122.65 S	163.35 W	204.27@	233.10	0.37
3379.00	6.16	228.27	3367.46	96.00	214.70	129.44 S	171.29 W	214.70@	232.92	0.32
3474.00	7.21	229.44	3461.82	95.00	225.73	136.71 S	179.62 W	225.73@	232.72	1.11
3569.00	7.30	228.22	3556.06	95.00	237.69	144.61 S	188.65 W	237.70@	232.53	0.19
3664.00	7.30	228.30	3650.29	95.00	249.72	152.64 S	197.66 W	249.74@	232.32	0.01
3760.00	7.12	237.30	3745.53	96.00	261.74	159.92 S	207.22 W	261.75@	232.34	1.19
3855.00	6.77	242.16	3839.83	95.00	273.13	165.71 S	217.12 W	273.14@	232.65	0.72
3950.00	6.68	239.22	3934.18	95.00	284.15	171.15 S	226.82 W	284.15@	232.96	0.37
4045.00	6.42	236.85	4028.56	95.00	294.94	176.89 S	236.02 W	294.94@	233.15	0.39
4140.00	6.77	233.47	4122.93	95.00	305.84	183.12 S	244.96 W	305.84@	233.22	0.55
4236.00	7.30	231.49	4218.21	96.00	317.60	190.29 S	254.28 W	317.60@	233.19	0.61
4331.00	7.30	232.09	4312.44	95.00	329.66	197.76 S	263.77 W	329.67@	233.14	0.08
4426.00	7.39	236.70	4406.66	95.00	341.80	204.82 S	273.64 W	341.80@	233.18	0.63
4521.00	7.21	231.12	4500.89	95.00	353.85	211.92 S	283.38 W	353.86@	233.21	0.77
4617.00	7.03	231.07	4596.15	96.00	365.74	219.39 S	292.64 W	365.75@	233.14	0.19
4712.00	7.03	231.24	4690.44	95.00	377.36	226.68 S	301.70 W	377.37@	233.08	0.02
4807.00	7.30	231.29	4784.70	95.00	389.21	234.10 S	310.94 W	389.21@	233.03	0.28
4902.00	6.95	230.06	4878.96	95.00	400.98	241.56 S	320.06 W	400.98@	232.96	0.40
4998.00	6.95	234.05	4974.26	96.00	412.59	248.70 S	329.21 W	412.59@	232.93	0.50
5093.00	6.95	235.00	5068.56	95.00	424.08	255.37 S	338.57 W	424.08@	232.97	0.12
5179.00	6.60	237.61	5153.96	86.00	434.21	261.00 S	347.01 W	434.21@	233.05	0.54
STRAIGHT LINE PROJECTION TO BIT @ 5227' MD.										
5227.00	6.60	237.61	5201.64	48.00	439.71	263.96 S	351.67 W	439.71@	233.11	0.00

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	MACK ENERGY CORPORATION		
LEASE / WELL No.:	LOBOS FEDERAL	#1	
WELL LOCATION:	EDDY COUNTY		
COUNTY / STATE / COUNTRY:	EDDY	NM	USA
RIG:	SILVER OAK #2		
API WELL No:	30-015-36318		
JOB No:	101009234-WT-WT		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	PES		

WELL SITE INFORMATION

TOTAL MAGNETIC CORRECTION (TMC):			
On Wall Plat:	8.11	LWD Calculated:	8.108
		Agreed Upon:	8.11
X =	514879.700000	Feet	Y = 644237.700000
			Feet
SITE LATITUDE:	32.771092 N	SITE LONGITUDE:	104.284924 W
GRID SYSTEM:	TRUE ☐ UTM ☒	LAMBERT ☐	ZONE: NEW MEXICO EAST
PROPOSED DRIFT DIRECTION:	232.9		
KELLY BUSHING ELEVATION:	17		
ALTITUDE:	3572	Feet	WATER DEPTH:
			Feet

TIE-IN SURVEY

MEASURED DEPTH:	1251.6		
DRIFT ANGLE:	1		
DRIFT DIRECTION:	156.1		
TRUE VERTICAL DEPTH:	1251.56		
VERTICAL SECTION:	7.95		
RECTANGULAR COORDINATE (N / S) :	-5.84		
RECTANGULAR COORDINATE (E / W) :	-5.56		
CLOSURE DISTANCE / DIRECTION:	8.06	223.59	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	SCIENTIFIC GYRO		
COPY OF TIE-IN SURVEY REPORT	☐ YES ☒ NO		

WELL PLAN

KICKOFF DEPTH:	1251.6	TOTAL DEPTH:	5227
KICKOFF ANGLE:	1	MAX ANGLE:	7

PES Engineers:

RAFAEL DONARUMMA

JAY FULTON

*Signature of both field engineers required if applicable

Directional Driller: PAT DILLON / JAVIER C.

DATE: 10-Nov-2009

TIE IN FROM
PAT DILLON

@
1251.60M



Job Number: 101009234-WT-WT

Company: Mack Energy

Lease/Well: Lobos Federal #1

Location: Eddy County

Rig Name: Silveroak #2

RKB: 17.0

G.L. or M.S.L.: □

State/Country: New Mexico

Declination: 8.13

Grid: .03

File name: C:\WINSERVE\LOBFED#1.SVY

Date/Time: 10-Nov-09 / 18:15

Curve Name: Survey's As Well Drilled

Survey's As Well Drilled

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 232.90
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
138.00	.40	279.10	138.00	.08	-.48	.33	.48	279.10	.29
289.00	.70	233.10	288.99	-.39	-1.73	1.62	1.78	257.19	.34
403.00	.70	254.10	402.98	-1.00	-2.96	2.97	3.13	251.28	.22
555.00	.00	120.10	554.98	-1.26	-3.85	3.83	4.05	251.93	.46
707.00	.50	233.10	706.98	-1.66	-4.38	4.50	4.69	249.31	.33
934.20	.50	198.10	934.17	-3.19	-5.48	6.30	6.35	239.79	.13
1092.90	.30	210.10	1092.87	-4.21	-5.91	7.25	7.25	234.52	.14
1251.60	1.00	156.10	1251.56	-5.84	-5.56	7.95	8.06	223.59	.54

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

MACK ENERGY
LOBOS FEDERAL #1
EDDY COUNTY, NEW MEXICO
Rig:SILVER OAK 2

Fri Nov 06 16:54:58 2009

Coordinates

Latitude: 32.771092 N (32 deg. 46 min. 15.9320 sec.)
Longitude: 104.284924 W (-104 deg. 17 min. 5.7264 sec.)
Elevation: 3589.50 feet.
Calculation Date: Nov/06/2009

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.6250 degrees
Total Magnetic Field: 0.49055 gauss
Magnetic Declination: 8.134566 degrees
Horizontal Intensity: 0.240625 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 8.134566 Degr

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 514879.7000 feet
Y: 644237.7000 feet
True to Grid: (convergence) -0.026203 degrees
Magnetic to Grid: 8.108363 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 8.108363 Degr.

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

Field
Copy

MACK ENERGY CORPORATION
LOBOS FEDERAL #1
RED LAKE; GLORIETA-YESO
Rig:SILVER OAK #2

Mon Nov 16 07:15:33 2009

Coordinates

Latitude: 32.771092 N (32 deg. 46 min. 15.9320 sec.)
Longitude: 104.284924 W (-104 deg. 17 min. 5.7264 sec.)
Elevation: 3589.00 feet.
Calculation Date: Nov/10/2009

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.6247 degrees
Total Magnetic Field: 0.49081 gauss
Magnetic Declination: 8.135109 degrees
Horizontal Intensity: 0.240755 gauss

To Convert a Magnetic Dir. to a TRUE North Dir. Add 8.135109 Degs

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 514879.7000 feet
Y: 644237.7000 feet
True to Grid: (convergence) -0.026203 degrees
Magnetic to Grid: 8.108906 degrees

To Convert a Magnetic Dir. to a GRID dir. Add 8.108906 Degs.

Form 3160-3
(April 2004)

HIGH CAVEKARST

AAE - CPO

MAY 15 2008

FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No NMNM-029135	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Mack Energy Corporation		7. If Unit or CA Agreement, Name and No	
3a. Address P.O. Box 960 Artesia, NM 88211-0960		8. Lease Name and Well No. Lobos Federal #1	
3b. Phone No. (include area code) (505) 748-1288		9. API Well No. 30-015-36318	
4. Location of Well (Report location clearly and accurately with any State requirements*) At surface: 605 FSL & 2015 FWL At proposed prod. zone: 330 FSL & 1650 FWL		10. Field and Pool, or Exploratory Red Lake; Glorieta-Yeso	
14. Distance in miles and direction from nearest town or post office* 7 miles southeast of Artesia, NM		11. Sec, T R M or Blk and Survey or Area Sec. 4 T18S R27E	
15. Distance from proposed location* to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any) 330		12. County or Parish Eddy	
16. No. of acres in lease 38.43		13. State NM	
17. Spacing Unit dedicated to this well 38.43		19. Proposed Depth 5200 TVD 5570 MD	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 300		20. BLM/BIA Bond No. on file NMB000286	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3572' GR		22. Approximate date work will start* 5/5/08	
		23. Estimated duration 12 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form.

- | | |
|---|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer |

25. Signature <i>Jerry W. Sherrell</i>	Name (Printed/Typed) Jerry W. Sherrell	Date 4/4/08
Title Production Clerk		
Approved by (Signature) <i>/s/ James Stovall</i>	Name (Printed/Typed)	Date MAY 13 2008
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached

APPROVAL FOR TWO YEARS

, make it a crime for any person knowingly and willfully to make to any department or agency of the United States as to any matter within its jurisdiction

NOTE: New Pit Rule
NMAC 19-15-17

Witness Surface Casing

Roswell Controlled Water Basin

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

**APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED**

1/24/08