

HOBBS OCD

DEC 15 2014

RECEIVED

Mack Energy

Lea County, NM (NAD83)

Norway State

#2

OH

Plan: Plan #2

Standard Planning Report

11 December, 2014

DEC 18 2014

Wellplanning

Planning Report

Database: EDM 5000.1 Single User Db
Company: Mack Energy
Project: Lea County,NM (NAD83)
Site: Norway State
Well: #2
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #2
TVD Reference: WELL @ 3525.4usft (Original Well Elev)
MD Reference: WELL @ 3525.4usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Lea County,NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Norway State		
Site Position:		Northing:	522,984.87 usft
From:	Map	Easting:	885,771.76 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 25' 58.094 N
		Longitude:	103° 13' 1.080 W
		Grid Convergence:	0.60 °

Well	#2		
Well Position	+N/-S	0.0 usft	Northing: 522,984.87 usft
	+E/-W	0.0 usft	Easting: 885,771.76 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	Latitude: 32° 25' 58.094 N
			Longitude: 103° 13' 1.080 W
			Ground Level: 3,508.4 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	12/8/2014	(°)
			7.00
			Dip Angle
			(°)
			60.35
			Field Strength
			(nT)
			48,430

Design	Plan #2		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			197.06

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,650.0	0.00	0.00	2,650.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,149.1	29.94	197.06	3,126.7	-121.9	-37.4	6.00	6.00	0.00	197.06	
4,183.9	29.94	197.06	4,023.3	-615.7	-188.9	0.00	0.00	0.00	0.00	
4,683.0	0.00	0.00	4,500.0	-737.5	-226.3	6.00	-6.00	0.00	180.00	VP(NS#1)
7,183.0	0.00	0.00	7,000.0	-737.5	-226.3	0.00	0.00	0.00	0.00	

Wellplanning

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 Well: #2
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 Design: Plan #2

Local Co-ordinate Reference: Well #2
 TVD Reference: WELL @ 3525.4usft (Original Well Elev)
 MD Reference: WELL @ 3525.4usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,650.0	0.00	0.00	2,650.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	3.00	197.06	2,700.0	-1.3	-0.4	1.3	6.00	6.00	0.00
2,750.0	6.00	197.06	2,749.8	-5.0	-1.5	5.2	6.00	6.00	0.00
2,800.0	9.00	197.06	2,799.4	-11.2	-3.4	11.8	6.00	6.00	0.00
2,850.0	12.00	197.06	2,848.5	-19.9	-6.1	20.9	6.00	6.00	0.00
2,900.0	15.00	197.06	2,897.2	-31.1	-9.5	32.5	6.00	6.00	0.00
2,950.0	18.00	197.06	2,945.1	-44.7	-13.7	46.7	6.00	6.00	0.00
3,000.0	21.00	197.06	2,992.2	-60.6	-18.6	63.4	6.00	6.00	0.00
3,050.0	24.00	197.06	3,038.4	-78.9	-24.2	82.6	6.00	6.00	0.00
3,100.0	27.00	197.06	3,083.5	-99.5	-30.5	104.1	6.00	6.00	0.00
3,149.1	29.94	197.06	3,126.7	-121.9	-37.4	127.5	6.00	6.00	0.00
3,200.0	29.94	197.06	3,170.8	-146.2	-44.9	152.9	0.00	0.00	0.00
3,300.0	29.94	197.06	3,257.4	-193.9	-59.5	202.8	0.00	0.00	0.00
3,400.0	29.94	197.06	3,344.1	-241.6	-74.1	252.7	0.00	0.00	0.00
3,500.0	29.94	197.06	3,430.7	-289.3	-88.8	302.6	0.00	0.00	0.00
3,600.0	29.94	197.06	3,517.4	-337.0	-103.4	352.6	0.00	0.00	0.00
3,700.0	29.94	197.06	3,604.0	-384.8	-118.1	402.5	0.00	0.00	0.00
3,800.0	29.94	197.06	3,690.7	-432.5	-132.7	452.4	0.00	0.00	0.00
3,900.0	29.94	197.06	3,777.3	-480.2	-147.4	502.3	0.00	0.00	0.00
4,000.0	29.94	197.06	3,864.0	-527.9	-162.0	552.2	0.00	0.00	0.00
4,100.0	29.94	197.06	3,950.6	-575.7	-176.6	602.1	0.00	0.00	0.00
4,183.9	29.94	197.06	4,023.3	-615.7	-188.9	644.0	0.00	0.00	0.00
4,200.0	28.98	197.06	4,037.4	-623.3	-191.2	651.9	6.00	-6.00	0.00
4,250.0	25.98	197.06	4,081.7	-645.3	-198.0	675.0	6.00	-6.00	0.00
4,300.0	22.98	197.06	4,127.2	-665.1	-204.1	695.7	6.00	-6.00	0.00
4,350.0	19.98	197.06	4,173.7	-682.6	-209.5	714.0	6.00	-6.00	0.00
4,400.0	16.98	197.06	4,221.2	-697.8	-214.1	729.9	6.00	-6.00	0.00

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Design: Plan #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well #2
 WELL @ 3525.4usft (Original Well Elev)
 WELL @ 3525.4usft (Original Well Elev)
 Grid
 Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,450.0	13.98	197.06	4,269.3	-710.5	-218.0	743.2	6.00	-6.00	0.00
4,500.0	10.98	197.06	4,318.2	-720.8	-221.2	754.0	6.00	-6.00	0.00
4,550.0	7.98	197.06	4,367.5	-728.7	-223.6	762.3	6.00	-6.00	0.00
4,600.0	4.98	197.06	4,417.1	-734.1	-225.3	767.9	6.00	-6.00	0.00
4,650.0	1.98	197.06	4,467.0	-737.0	-226.2	770.9	6.00	-6.00	0.00
4,683.0	0.00	0.00	4,500.0	-737.5	-226.3	771.5	6.00	-6.00	0.00
VP(NS#1)									
4,700.0	0.00	0.00	4,517.0	-737.5	-226.3	771.5	0.00	0.00	0.00
4,800.0	0.00	0.00	4,617.0	-737.5	-226.3	771.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,717.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,817.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,100.0	0.00	0.00	4,917.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,017.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,117.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,217.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,500.0	0.00	0.00	5,317.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,417.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,517.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,617.0	-737.5	-226.3	771.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,717.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,817.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,100.0	0.00	0.00	5,917.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,017.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,117.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,217.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,317.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,417.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,517.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,617.0	-737.5	-226.3	771.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,717.0	-737.5	-226.3	771.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,817.0	-737.5	-226.3	771.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,917.0	-737.5	-226.3	771.5	0.00	0.00	0.00
7,183.0	0.00	0.00	7,000.0	-737.5	-226.3	771.5	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
VP(NS#1)	0.00	0.00	4,500.0	-737.5	-226.3	522,247.32	885,545.44	32° 25' 50.820 N	103° 13' 3.810 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

NEXUS

DIRECTIONAL SOLUTIONS, L.P.

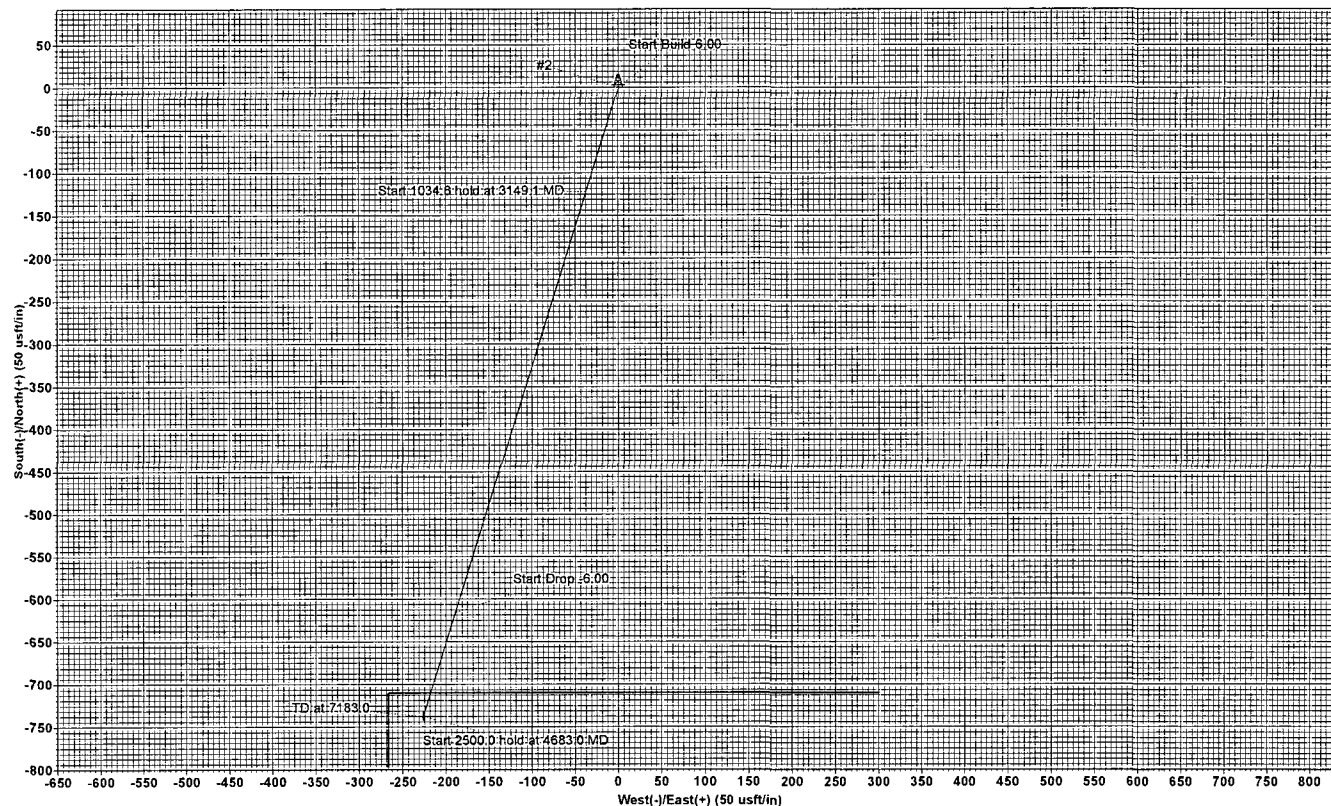
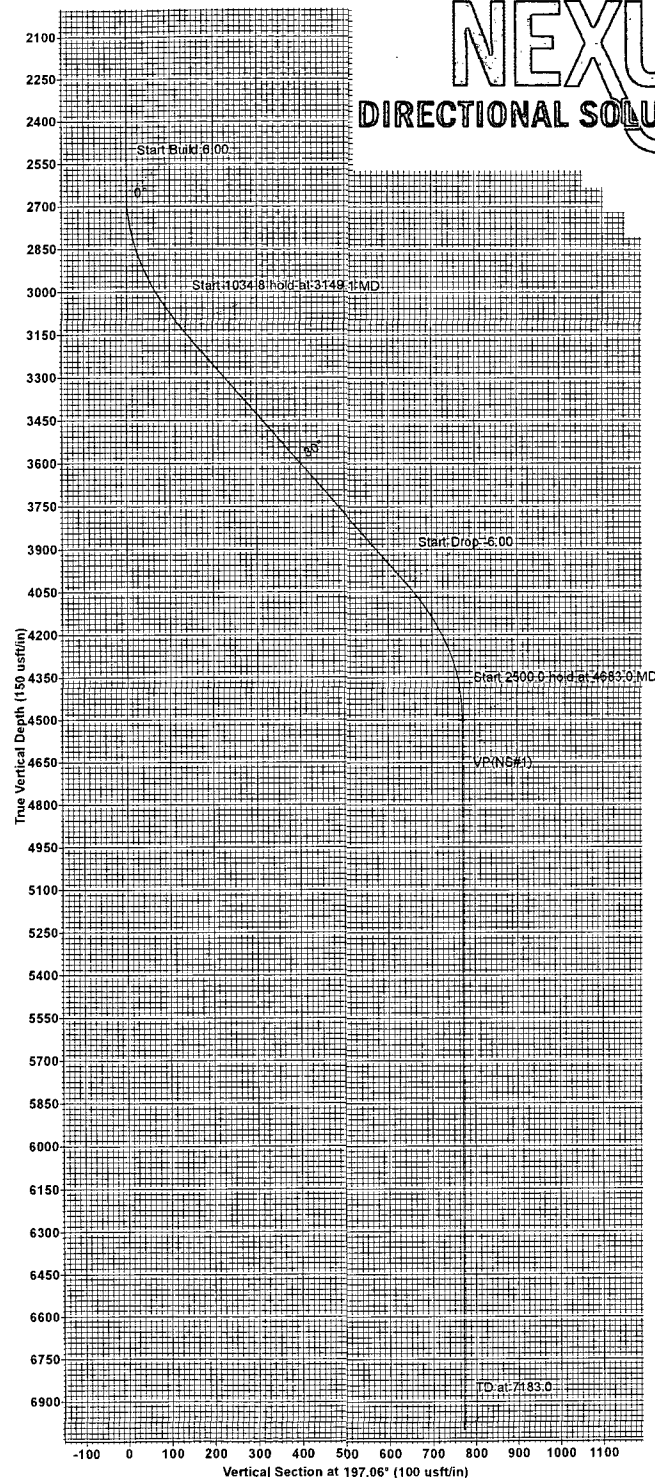


Azimuths to Grid North
True North: -0.60°
Magnetic North: 6.40°

Magnetic Field
Strength: 48429.6nT
Dip Angle: 60.35°
Date: 12/8/2014
Model: IGRF2010

Norway State #2
Lea County, NM (NAD83)
Northing: (Y) 522984.87
Easting: (X) 885771.76
Plan #2

To convert a Magnetic Direction to a Grid Direction, Add 6.40°
To convert a True Direction to a Grid Direction, Subtract 0.60°



Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone

Local Origin: Well #2, Grid North

Latitude: 32° 25' 58.094 N
Longitude: 103° 13' 1.080 W

Grid East: 885771.76
Grid North: 522984.87
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 08-Dec-14
Magnetic Declination: 7.00°
Dip Angle from Horizontal: 60.35°
Magnetic Field Strength: 48430

To convert a Magnetic Direction to a Grid Direction, Add 6.40°
To convert a Magnetic Direction to a True Direction, Add 7.00° East
To convert a True Direction to a Grid Direction, Subtract 0.60°

LEGEND

Plan #2

WELL DETAILS:

WELL @ 3525.4usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	522984.87	885771.76	32° 25' 58.094 N	103° 13' 1.080 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
VP(NS#1)	4500.0	-737.5	-226.3	522247.32	885545.44

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2650.0	0.00	0.00	2650.0	0.0	0.0	0.00	0.00	0.0	
3149.1	29.94	197.06	3126.7	-121.9	-37.4	6.00	197.06	127.5	
4183.9	29.94	197.06	4023.3	-615.7	-188.9	0.00	0.00	644.0	
4683.0	0.00	0.00	4500.0	-737.6	-226.3	6.00	180.00	771.5	
7183.0	0.00	0.00	7000.0	-737.6	-226.3	0.00	0.00	771.5	VP(NS#1)

Lease Lines Subject to Customer Approval