

Mack Energy
Chavez County (NAD83)
Seahawks Federal
#2

OH

Survey: MWD #1

Standard Survey Report

22 October, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 06 2015

RECEIVED

30-005-64207

Wellplanning

Survey Report

Company:	Mack Energy	Local Co-ordinate Reference:	Well #2
Project:	Chavez County (NAD83)	TVD Reference:	WELL @ 3764.3usft (Original Well Elev)
Site:	Seahawks Federal	MD Reference:	WELL @ 3764.3usft (Original Well Elev)
Well:	#2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project:	Chavez County (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:	Seahawks Federal		
Site Position:	Northing:	727,109.33 usft	Latitude: 32° 59' 54.712 N
From: Map	Easting:	624,515.76 usft	Longitude: 104° 3' 43.290 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.15 °

Well:	#2		
Well Position	+N/-S	0.0 usft	Northing: 727,109.33 usft
	+E/-W	0.0 usft	Easting: 624,515.76 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
			Ground Level: 3,746.8 usft

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	10/3/2014	7.47	60.73	48,695

Design:	OH				
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	309.05	

Survey Program	Date:	10/22/2014			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
240.0	3,435.0	MWD #1 (OH)	MWD	MWD - Standard	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
240.0	0.50	0.00	240.0	1.0	0.0	0.7	0.21	0.21	0.00	
393.0	0.30	0.00	393.0	2.1	0.0	1.3	0.13	-0.13	0.00	
453.0	1.10	83.10	453.0	2.3	0.6	1.0	1.84	1.33	138.50	
542.0	2.50	354.10	542.0	4.4	1.2	1.8	3.05	1.57	-100.00	
730.0	3.50	313.00	729.7	12.4	-3.4	10.4	1.23	0.53	-21.86	
917.0	5.80	320.00	916.1	23.5	-13.6	25.4	1.26	1.23	3.74	
1,105.0	8.10	301.70	1,102.7	37.7	-31.0	47.9	1.68	1.22	-9.73	
1,292.0	9.30	314.40	1,287.6	55.2	-53.0	76.0	1.21	0.64	6.79	
1,479.0	7.70	293.60	1,472.6	70.8	-75.3	103.1	1.84	-0.86	-11.12	

Wellplanning

Survey Report

Company:	Mack Energy	Local Co-ordinate Reference:	Well #2
Project:	Chavez County (NAD83)	TVD Reference:	WELL @ 3764.3usft (Original Well Elev)
Site:	Seahawks Federal	MD Reference:	WELL @ 3764.3usft (Original Well Elev)
Well:	#2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
1,667.0	7.00	307.00	1,659.0	82.8	-96.0	126.7	0.98	-0.37	7.13
1,855.0	3.50	307.00	1,846.2	93.1	-109.7	143.9	1.86	-1.86	0.00
2,008.5	1.10	283.09	1,999.6	96.3	-114.9	149.9	1.65	-1.57	-15.58
VP(SF#2)									
2,043.0	0.70	256.00	2,034.1	96.3	-115.4	150.3	1.65	-1.15	-78.51
2,230.0	2.50	136.50	2,221.0	93.1	-113.7	147.0	1.56	0.96	-63.90
2,417.0	1.80	142.10	2,407.9	87.8	-109.1	140.1	0.39	-0.37	2.99
2,606.0	1.80	144.60	2,596.8	83.0	-105.6	134.3	0.04	0.00	1.32
2,793.0	1.60	138.30	2,783.7	78.7	-102.2	128.9	0.15	-0.11	-3.37
2,981.0	1.80	137.20	2,971.6	74.6	-98.4	123.4	0.11	0.11	-0.59
3,169.0	1.60	118.90	3,159.5	71.1	-94.1	117.9	0.31	-0.11	-9.73
3,356.0	1.20	115.80	3,346.5	69.0	-90.0	113.4	0.22	-0.21	-1.66
3,435.0	1.40	108.40	3,425.5	68.3	-88.4	111.7	0.33	0.25	-9.37

Checked By: _____	Approved By: _____	Date: _____
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NEXUS

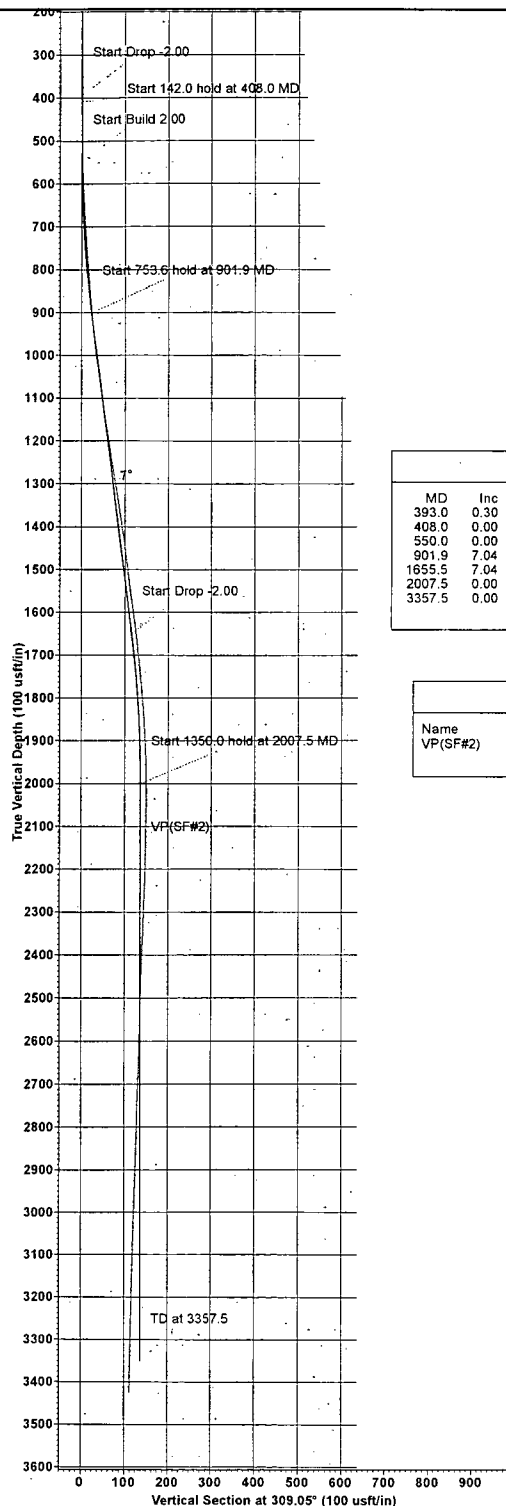
DIRECTIONAL SOLUTIONS, L.P.



Azimuths to Grid North
True North: -0.15°
Magnetic North: 7.32°

Magnetic Field
Strength: 48694.6snT
Dip Angle: 60.73°
Date: 10/3/2014
Model: IGRF2010

To convert a Magnetic Direction to a Grid Direction, Add 7.32°
To convert a True Direction to a Grid Direction, Subtract 0.15°



WELL DETAILS:					
WELL @ 3764.3usft (Original Well Elev)					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	727109.33	624515.76	32° 59' 54.712 N	104° 3' 43.290 W

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
393.0	0.30	0.00	393.0	2.1	0.0	0.00	0.00	1.3
408.0	0.00	0.00	408.0	2.2	0.0	2.00	180.00	1.4
550.0	0.00	0.00	550.0	2.2	0.0	0.00	0.00	1.4
901.9	7.04	308.35	901.1	15.6	-16.9	2.00	308.35	22.9
1655.5	7.04	308.35	1648.9	72.8	-89.4	0.00	0.00	115.3
2007.5	0.00	0.00	2000.0	86.2	-106.3	2.00	180.00	136.9
3357.5	0.00	0.00	3350.0	86.2	-106.3	0.00	0.00	136.9

VP(SF#2)

DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Northing	Easting
VP(SF#2)	2000.0	86.2	-106.3	727195.57	624409.47

Seahawks Federal #2
Chavez County (NAD83)
Northing: (Y) 727109.33
Easting: (X) 624515.76
Plan #2

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° 59' 54.712 N
Longitude: 104° 3' 43.290 W

Grid East: 624515.76
Grid North: 727109.33
Scale Factor: 1.000

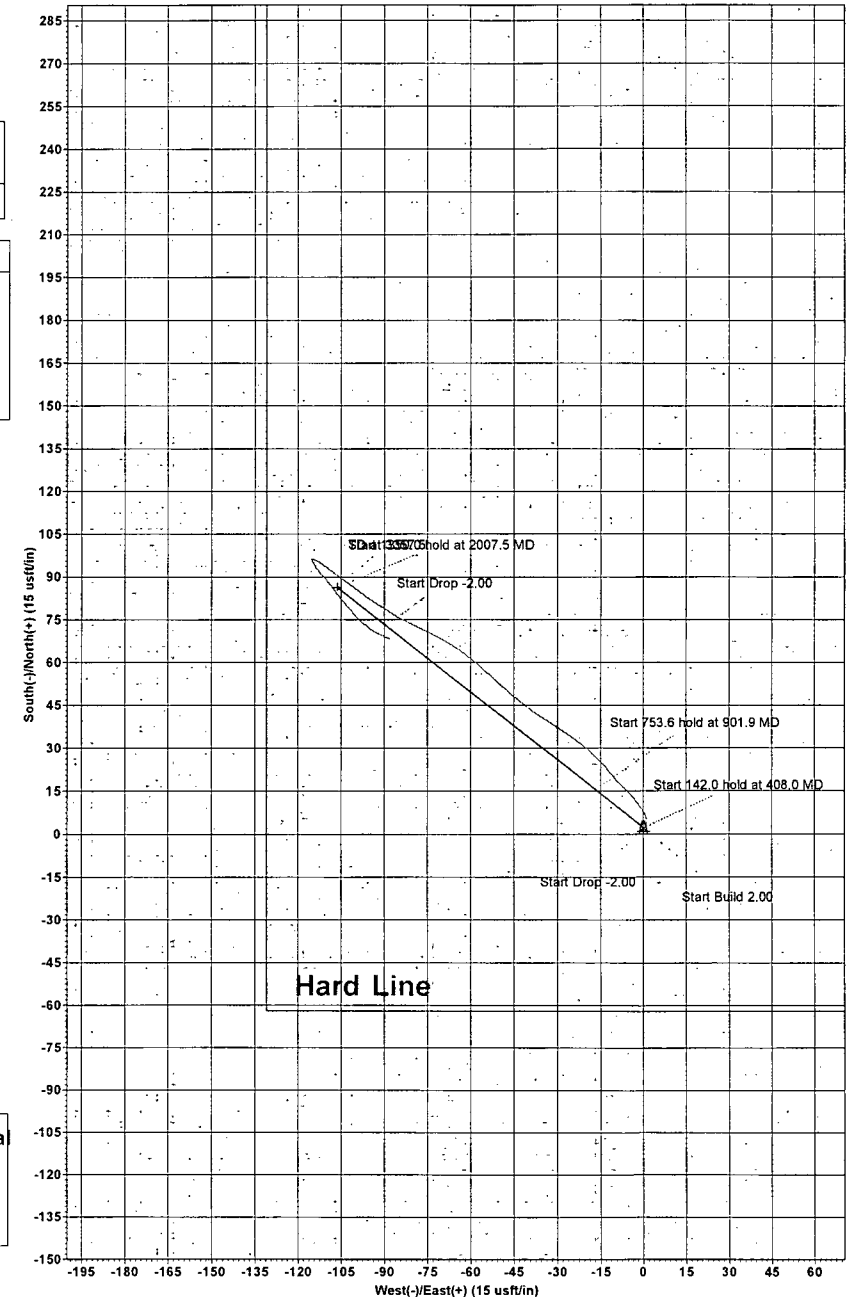
Geomagnetic Model: IGRF2010
Sample Date: 03-Oct-14
Magnetic Declination: 7.47°
Dip Angle from Horizontal: 60.73°
Magnetic Field Strength: 48695

To convert a Magnetic Direction to a Grid Direction, Add 7.32°
To convert a Magnetic Direction to a True Direction, Add 7.47° East
To convert a True Direction to a Grid Direction, Subtract 0.15°

LEGEND

#2, OH, MWD #1
+ Plan #2

Lease Lines Subject to Customer Approval





PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 06 2015

RECEIVED

October 27, 2014

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

RE: Seahawks Federal #2
1588' FSL & 859' FEL
Sec. 19, T15S, R29E
Chaves County, New Mexico

Dear Sir,

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

Very truly yours,

A handwritten signature in cursive script, appearing to read "Graham".

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 27th day of October, 2014.

A handwritten signature in cursive script, appearing to read "Regina L. Garner".

Notary Public

SEAHAWKS FED #2

Date	Depth	Deviation	Direction
10/18/2014	214	0.50	0.00
10/18/2014	240	0.50	0.00
10/18/2014	339	0.30	0.00
10/19/2014	453	1.10	83.10
10/19/2014	513	2.50	354.10
10/19/2014	730	3.50	313.00
10/19/2014	917	5.80	320.00
10/20/2014	1105	8.10	301.10
10/20/2014	1292	9.30	314.40
10/20/2014	1479	7.70	293.60
10/20/2014	1667	7.60	304.50
10/20/2014	1859	3.50	307.00
10/20/2014	2043	0.70	256.00
10/20/2014	2230	2.50	136.50
10/20/2014	2417	1.80	142.10
10/20/2014	2606	1.80	144.60
10/20/2014	2793	1.60	138.30
10/21/2014	2981	1.80	137.20
10/21/2014	3169	1.60	118.90
10/21/2014	3356	1.20	115.80
10/22/2014	3435	1.40	108.40