



ConocoPhillips

Lea County, NM

War Hammer 25 Fed Com

TC 16H

16H

Plan: Design #1

Standard Planning Report

16 April, 2014

gyro/data

Precision Wellbore Placement

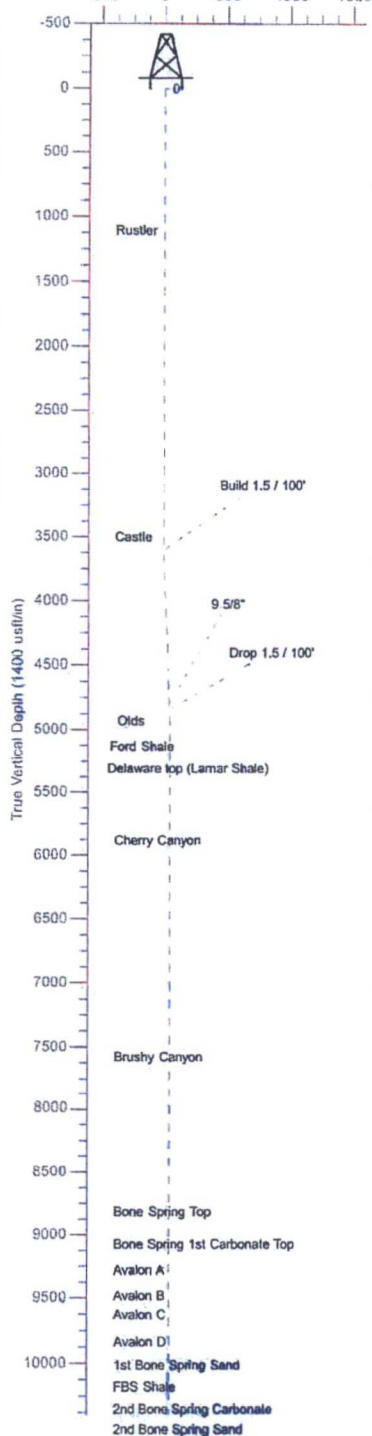
ConocoPhillips

ConocoPhillips
Lea County, NM
War Hammer 25 Fed Com
TC 16H
16H
Plan: Design #1 (TC 16H/16H)
RKB @ 3164.00usft (RKB:25' + GL: 3139')

gyrodata

Precision Wellbore Placement

Vertical Section at 179.75° (1400 usft/in)



Azimuths to Grid North
True North: -0.37°
Magnetic North: 6.99°
Magnetic Field
Strength: 48207.3nT
Dip Angle: 59.90°
Date: 4/16/2014
Model: USER DEFINED

FORMATION TOPS ALONG WELLPATH

TVDPATH	MDPATH	FORMATION
894.00	894.00	Rustler
3289.00	3289.00	Castle
4689.00	4689.93	Delaware top (Lamar Shale)
4749.00	4749.99	Ford Shale
4769.00	4770.01	Olds
5671.00	5672.13	Cherry Canyon
7368.00	7369.13	Brushy Canyon
8607.00	8608.13	Bone Spring Top
8865.00	8866.13	Bone Spring 1st Carbonate Top
9071.00	9072.13	Avalon A
9273.00	9274.13	Avalon B
9422.00	9423.13	Avalon C
9716.00	9717.13	Avalon D
9758.00	9759.13	1st Bone Spring Sand
9970.00	9971.13	FBS Shale
10141.00	10142.13	2nd Bone Spring Carbonate
10298.00	10299.13	2nd Bone Spring Sand
10654.00	10655.13	3rd Bone Spring Carbonate
11249.00	11576.83	3dBSC target landing

PROJECT DETAILS: Lea County, NM

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
North Reference: Grid
System Datum: Mean Sea Level
To convert a True Direction to a Grid Direction, Subtract 0.37°
To convert a Magnetic Direction to a True Direction, Add 7.36° East
To convert a Magnetic Direction to a Grid Direction, Add 6.99°

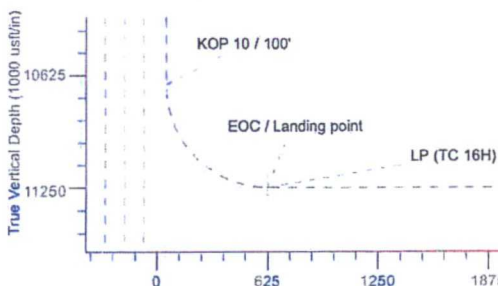
CASING DETAILS

TVD	MD	Name	Size
4794.00	4795.03	9 5/8"	9.62

Notice: Section Lines and Hardlines are estimates only and are subject to customer approval

gyrodrill

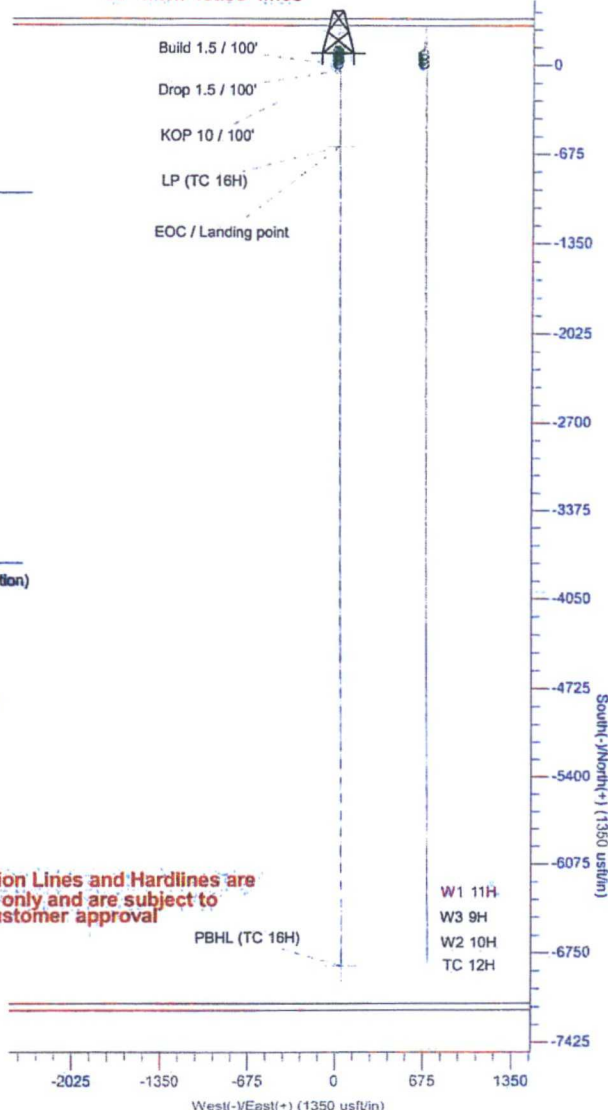
DIRECTIONAL MOTORS



Target Line: 11,249' TVD @ 0° VS w/ 90° Inc

Vertical Section at 179.75° (1000 usft/in)

50' from lease lines



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3600.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	Build 1.5 / 100'
3	3766.67	2.50	160.00	3766.61	-3.42	1.24	1.50	160.00	3.42	Drop 1.5 / 100'
4	4841.08	2.50	160.00	4840.00	-47.48	17.27	0.00	0.00	47.53	
5	5007.74	0.00	0.00	5006.61	-50.87	18.52	1.50	180.00	50.95	
6	10677.17	0.00	0.00	10676.04	-50.87	18.52	0.00	0.00	50.95	
7	11577.17	90.00	179.75	11249.00	-623.82	21.01	10.00	179.75	623.91	KOP 10 / 100'
8	17801.23	90.00	179.75	11249.00	-6847.82	48.14	0.00	0.00	6847.96	EOC / Landing point

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
LP (TC 16H)	11249.00	-623.82	21.01	371036.55	718995.08
PBHL (TC 16H)	- plan hits target center	-6847.82	48.14	364812.55	719022.21

Database:	GyrodataNWDB	Local Co-ordinate Reference:	Well TC 16H
Company:	ConocoPhillips	TVD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Project:	Lea County, NM	MD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	War Hammer 25 Fed Com		
Site Position:		Northing:	371,782.24 usft
From:	Map	Easting:	721,157.76 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	32° 1' 12.49 N
		Longitude:	103° 37' 11.14 W
		Grid Convergence:	0.38 °

Well	TC 16H		
Well Position	+N/-S	-121.87 usft	Northing:
	+E/-W	-2,183.69 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 1' 11.43 N
		Longitude:	103° 37' 36.51 W
		Ground Level:	3,139.00 usft

Wellbore	16H		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	4/16/2014	7.36	59.90	48,207

Design	Design #1		
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Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.75

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,766.67	2.50	160.00	3,766.61	-3.42	1.24	1.50	1.50	0.00	160.00	
4,841.08	2.50	160.00	4,840.00	-47.46	17.27	0.00	0.00	0.00	0.00	
5,007.74	0.00	0.00	5,006.61	-50.87	18.52	1.50	-1.50	0.00	180.00	
10,677.17	0.00	0.00	10,676.04	-50.87	18.52	0.00	0.00	0.00	0.00	
11,577.17	90.00	179.75	11,249.00	-623.82	21.01	10.00	10.00	19.97	179.75	
17,801.23	90.00	179.75	11,249.00	-6,847.82	48.14	0.00	0.00	0.00	0.00 PBHL (TC 16H)	

Database:	GyrodataNWDB	Local Co-ordinate Reference:	Well TC 16H
Company:	ConocoPhillips	TVD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Project:	Lea County, NM	MD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	1.50	160.00	3,699.99	-1.23	0.45	1.23	1.50	1.50	0.00
3,766.67	2.50	160.00	3,766.61	-3.42	1.24	3.42	1.50	1.50	0.00
3,800.00	2.50	160.00	3,799.92	-4.78	1.74	4.79	0.00	0.00	0.00
3,900.00	2.50	160.00	3,899.82	-8.88	3.23	8.90	0.00	0.00	0.00
4,000.00	2.50	160.00	3,999.73	-12.98	4.72	13.00	0.00	0.00	0.00
4,100.00	2.50	160.00	4,099.63	-17.08	6.22	17.11	0.00	0.00	0.00
4,200.00	2.50	160.00	4,199.53	-21.18	7.71	21.21	0.00	0.00	0.00
4,300.00	2.50	160.00	4,299.44	-25.28	9.20	25.32	0.00	0.00	0.00
4,400.00	2.50	160.00	4,399.34	-29.38	10.69	29.42	0.00	0.00	0.00
4,500.00	2.50	160.00	4,499.25	-33.47	12.18	33.53	0.00	0.00	0.00
4,600.00	2.50	160.00	4,599.15	-37.57	13.68	37.63	0.00	0.00	0.00
4,700.00	2.50	160.00	4,699.06	-41.67	15.17	41.74	0.00	0.00	0.00
4,800.00	2.50	160.00	4,798.96	-45.77	16.66	45.84	0.00	0.00	0.00
4,841.08	2.50	160.00	4,840.00	-47.46	17.27	47.53	0.00	0.00	0.00
4,900.00	1.62	160.00	4,898.89	-49.44	18.00	49.52	1.50	-1.50	0.00
5,000.00	0.12	160.00	4,998.87	-50.86	18.51	50.94	1.50	-1.50	0.00
5,007.74	0.00	0.00	5,006.61	-50.87	18.52	50.95	1.50	-1.50	0.00

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Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,100.00	0.00	0.00	5,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,200.00	0.00	0.00	5,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,300.00	0.00	0.00	5,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,400.00	0.00	0.00	5,398.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,500.00	0.00	0.00	5,498.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,600.00	0.00	0.00	5,598.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,700.00	0.00	0.00	5,698.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,800.00	0.00	0.00	5,798.87	-50.87	18.52	50.95	0.00	0.00	0.00
5,900.00	0.00	0.00	5,898.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,000.00	0.00	0.00	5,998.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,100.00	0.00	0.00	6,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,200.00	0.00	0.00	6,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,300.00	0.00	0.00	6,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,400.00	0.00	0.00	6,398.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,500.00	0.00	0.00	6,498.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,600.00	0.00	0.00	6,598.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,700.00	0.00	0.00	6,698.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,800.00	0.00	0.00	6,798.87	-50.87	18.52	50.95	0.00	0.00	0.00
6,900.00	0.00	0.00	6,898.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,000.00	0.00	0.00	6,998.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,100.00	0.00	0.00	7,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,200.00	0.00	0.00	7,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,300.00	0.00	0.00	7,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,400.00	0.00	0.00	7,398.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,500.00	0.00	0.00	7,498.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,600.00	0.00	0.00	7,598.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,700.00	0.00	0.00	7,698.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,800.00	0.00	0.00	7,798.87	-50.87	18.52	50.95	0.00	0.00	0.00
7,900.00	0.00	0.00	7,898.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,000.00	0.00	0.00	7,998.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,100.00	0.00	0.00	8,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,200.00	0.00	0.00	8,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,300.00	0.00	0.00	8,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,400.00	0.00	0.00	8,398.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,500.00	0.00	0.00	8,498.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,600.00	0.00	0.00	8,598.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,700.00	0.00	0.00	8,698.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,800.00	0.00	0.00	8,798.87	-50.87	18.52	50.95	0.00	0.00	0.00
8,900.00	0.00	0.00	8,898.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,000.00	0.00	0.00	8,998.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,100.00	0.00	0.00	9,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,200.00	0.00	0.00	9,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,300.00	0.00	0.00	9,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,400.00	0.00	0.00	9,398.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,500.00	0.00	0.00	9,498.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,600.00	0.00	0.00	9,598.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,700.00	0.00	0.00	9,698.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,800.00	0.00	0.00	9,798.87	-50.87	18.52	50.95	0.00	0.00	0.00
9,900.00	0.00	0.00	9,898.87	-50.87	18.52	50.95	0.00	0.00	0.00
10,000.00	0.00	0.00	9,998.87	-50.87	18.52	50.95	0.00	0.00	0.00
10,100.00	0.00	0.00	10,098.87	-50.87	18.52	50.95	0.00	0.00	0.00
10,200.00	0.00	0.00	10,198.87	-50.87	18.52	50.95	0.00	0.00	0.00
10,300.00	0.00	0.00	10,298.87	-50.87	18.52	50.95	0.00	0.00	0.00
10,400.00	0.00	0.00	10,398.87	-50.87	18.52	50.95	0.00	0.00	0.00

Database:	GyrodatabWDB	Local Co-ordinate Reference:	Well TC 16H
Company:	ConocoPhillips	TVD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Project:	Lea County, NM	MD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
10,500.00	0.00	0.00	10,498.87	-50.87	18.52	50.95	0.00	0.00	0.00	
10,600.00	0.00	0.00	10,598.87	-50.87	18.52	50.95	0.00	0.00	0.00	
10,677.17	0.00	0.00	10,676.04	-50.87	18.52	50.95	0.00	0.00	0.00	
10,700.00	2.28	179.75	10,698.87	-51.33	18.52	51.41	10.00	10.00	0.00	
10,800.00	12.28	179.75	10,797.93	-63.99	18.57	64.07	10.00	10.00	0.00	
10,900.00	22.28	179.75	10,893.30	-93.66	18.70	93.74	10.00	10.00	0.00	
11,000.00	32.28	179.75	10,982.06	-139.44	18.90	139.52	10.00	10.00	0.00	
11,100.00	42.28	179.75	11,061.52	-199.93	19.17	200.02	10.00	10.00	0.00	
11,200.00	52.28	179.75	11,129.28	-273.31	19.49	273.39	10.00	10.00	0.00	
11,300.00	62.28	179.75	11,183.26	-357.34	19.85	357.42	10.00	10.00	0.00	
11,400.00	72.28	179.75	11,221.83	-449.46	20.25	449.55	10.00	10.00	0.00	
11,500.00	82.28	179.75	11,243.81	-546.89	20.68	546.97	10.00	10.00	0.00	
11,577.17	90.00	179.75	11,249.00	-623.82	21.01	623.91	10.00	10.00	0.00	
11,600.00	90.00	179.75	11,249.00	-646.65	21.11	646.74	0.00	0.00	0.00	
11,700.00	90.00	179.75	11,249.00	-746.65	21.55	746.74	0.00	0.00	0.00	
11,800.00	90.00	179.75	11,249.00	-846.65	21.98	846.74	0.00	0.00	0.00	
11,900.00	90.00	179.75	11,249.00	-946.65	22.42	946.74	0.00	0.00	0.00	
12,000.00	90.00	179.75	11,249.00	-1,046.65	22.86	1,046.74	0.00	0.00	0.00	
12,100.00	90.00	179.75	11,249.00	-1,146.65	23.29	1,146.74	0.00	0.00	0.00	
12,200.00	90.00	179.75	11,249.00	-1,246.65	23.73	1,246.74	0.00	0.00	0.00	
12,300.00	90.00	179.75	11,249.00	-1,346.65	24.16	1,346.74	0.00	0.00	0.00	
12,400.00	90.00	179.75	11,249.00	-1,446.64	24.60	1,446.74	0.00	0.00	0.00	
12,500.00	90.00	179.75	11,249.00	-1,546.64	25.03	1,546.74	0.00	0.00	0.00	
12,600.00	90.00	179.75	11,249.00	-1,646.64	25.47	1,646.74	0.00	0.00	0.00	
12,700.00	90.00	179.75	11,249.00	-1,746.64	25.91	1,746.74	0.00	0.00	0.00	
12,800.00	90.00	179.75	11,249.00	-1,846.64	26.34	1,846.74	0.00	0.00	0.00	
12,900.00	90.00	179.75	11,249.00	-1,946.64	26.78	1,946.74	0.00	0.00	0.00	
13,000.00	90.00	179.75	11,249.00	-2,046.64	27.21	2,046.74	0.00	0.00	0.00	
13,100.00	90.00	179.75	11,249.00	-2,146.64	27.65	2,146.74	0.00	0.00	0.00	
13,200.00	90.00	179.75	11,249.00	-2,246.64	28.09	2,246.74	0.00	0.00	0.00	
13,300.00	90.00	179.75	11,249.00	-2,346.64	28.52	2,346.74	0.00	0.00	0.00	
13,400.00	90.00	179.75	11,249.00	-2,446.64	28.96	2,446.74	0.00	0.00	0.00	
13,500.00	90.00	179.75	11,249.00	-2,546.63	29.39	2,546.74	0.00	0.00	0.00	
13,600.00	90.00	179.75	11,249.00	-2,646.63	29.83	2,646.74	0.00	0.00	0.00	
13,700.00	90.00	179.75	11,249.00	-2,746.63	30.27	2,746.74	0.00	0.00	0.00	
13,800.00	90.00	179.75	11,249.00	-2,846.63	30.70	2,846.74	0.00	0.00	0.00	
13,900.00	90.00	179.75	11,249.00	-2,946.63	31.14	2,946.74	0.00	0.00	0.00	
14,000.00	90.00	179.75	11,249.00	-3,046.63	31.57	3,046.74	0.00	0.00	0.00	
14,100.00	90.00	179.75	11,249.00	-3,146.63	32.01	3,146.74	0.00	0.00	0.00	
14,200.00	90.00	179.75	11,249.00	-3,246.63	32.44	3,246.74	0.00	0.00	0.00	
14,300.00	90.00	179.75	11,249.00	-3,346.63	32.88	3,346.74	0.00	0.00	0.00	
14,400.00	90.00	179.75	11,249.00	-3,446.63	33.32	3,446.74	0.00	0.00	0.00	
14,500.00	90.00	179.75	11,249.00	-3,546.62	33.75	3,546.74	0.00	0.00	0.00	
14,600.00	90.00	179.75	11,249.00	-3,646.62	34.19	3,646.74	0.00	0.00	0.00	
14,700.00	90.00	179.75	11,249.00	-3,746.62	34.62	3,746.74	0.00	0.00	0.00	
14,800.00	90.00	179.75	11,249.00	-3,846.62	35.06	3,846.74	0.00	0.00	0.00	
14,900.00	90.00	179.75	11,249.00	-3,946.62	35.50	3,946.74	0.00	0.00	0.00	
15,000.00	90.00	179.75	11,249.00	-4,046.62	35.93	4,046.74	0.00	0.00	0.00	
15,100.00	90.00	179.75	11,249.00	-4,146.62	36.37	4,146.74	0.00	0.00	0.00	
15,200.00	90.00	179.75	11,249.00	-4,246.62	36.80	4,246.74	0.00	0.00	0.00	
15,300.00	90.00	179.75	11,249.00	-4,346.62	37.24	4,346.74	0.00	0.00	0.00	
15,400.00	90.00	179.75	11,249.00	-4,446.62	37.67	4,446.74	0.00	0.00	0.00	
15,500.00	90.00	179.75	11,249.00	-4,546.62	38.11	4,546.74	0.00	0.00	0.00	
15,600.00	90.00	179.75	11,249.00	-4,646.61	38.55	4,646.74	0.00	0.00	0.00	

Database:	GyrodataNWDB	Local Co-ordinate Reference:	Well TC 16H
Company:	ConocoPhillips	TVD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Project:	Lea County, NM	MD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,700.00	90.00	179.75	11,249.00	-4,746.61	38.98	4,746.74	0.00	0.00	0.00
15,800.00	90.00	179.75	11,249.00	-4,846.61	39.42	4,846.74	0.00	0.00	0.00
15,900.00	90.00	179.75	11,249.00	-4,946.61	39.85	4,946.74	0.00	0.00	0.00
16,000.00	90.00	179.75	11,249.00	-5,046.61	40.29	5,046.74	0.00	0.00	0.00
16,100.00	90.00	179.75	11,249.00	-5,146.61	40.73	5,146.74	0.00	0.00	0.00
16,200.00	90.00	179.75	11,249.00	-5,246.61	41.16	5,246.74	0.00	0.00	0.00
16,300.00	90.00	179.75	11,249.00	-5,346.61	41.60	5,346.74	0.00	0.00	0.00
16,400.00	90.00	179.75	11,249.00	-5,446.61	42.03	5,446.74	0.00	0.00	0.00
16,500.00	90.00	179.75	11,249.00	-5,546.61	42.47	5,546.74	0.00	0.00	0.00
16,600.00	90.00	179.75	11,249.00	-5,646.60	42.90	5,646.74	0.00	0.00	0.00
16,700.00	90.00	179.75	11,249.00	-5,746.60	43.34	5,746.74	0.00	0.00	0.00
16,800.00	90.00	179.75	11,249.00	-5,846.60	43.78	5,846.74	0.00	0.00	0.00
16,900.00	90.00	179.75	11,249.00	-5,946.60	44.21	5,946.74	0.00	0.00	0.00
17,000.00	90.00	179.75	11,249.00	-6,046.60	44.65	6,046.74	0.00	0.00	0.00
17,100.00	90.00	179.75	11,249.00	-6,146.60	45.08	6,146.74	0.00	0.00	0.00
17,200.00	90.00	179.75	11,249.00	-6,246.60	45.52	6,246.74	0.00	0.00	0.00
17,300.00	90.00	179.75	11,249.00	-6,346.60	45.96	6,346.74	0.00	0.00	0.00
17,400.00	90.00	179.75	11,249.00	-6,446.60	46.39	6,446.74	0.00	0.00	0.00
17,500.00	90.00	179.75	11,249.00	-6,546.60	46.83	6,546.74	0.00	0.00	0.00
17,600.00	90.00	179.75	11,249.00	-6,646.60	47.26	6,646.74	0.00	0.00	0.00
17,700.00	90.00	179.75	11,249.00	-6,746.59	47.70	6,746.74	0.00	0.00	0.00
17,800.00	90.00	179.75	11,249.00	-6,846.59	48.13	6,846.74	0.00	0.00	0.00
17,801.23	90.00	179.75	11,249.00	-6,847.82	48.14	6,847.97	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL (TC 16H) - plan hits target center - Point	0.00	0.00	11,249.00	-6,847.82	48.14	364,812.55	719,022.21	32° 0' 3.66 N	103° 37' 36.47 W
LP (TC 16H) - plan hits target center - Point	0.00	0.00	11,249.00	-623.82	21.01	371,036.55	718,995.08	32° 1' 5.25 N	103° 37' 36.32 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
4,795.03	4,794.00	9 5/8"	9.62	12.25

Database:	GyrodataNWDB	Local Co-ordinate Reference:	Well TC 16H
Company:	ConocoPhillips	TVD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Project:	Lea County, NM	MD Reference:	RKB @ 3164.00usft (RKB:25' + GL: 3139')
Site:	War Hammer 25 Fed Com	North Reference:	Grid
Well:	TC 16H	Survey Calculation Method:	Minimum Curvature
Wellbore:	16H		
Design:	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
894.00	894.00	Rustler		0.00	179.75
3,289.00	3,289.00	Castle		0.00	179.75
4,689.93	4,689.00	Delaware top (Lamar Shale)		0.00	179.75
4,749.99	4,749.00	Ford Shale		0.00	179.75
4,770.01	4,769.00	Olds		0.00	179.75
5,672.13	5,671.00	Cherry Canyon		0.00	179.75
7,369.13	7,368.00	Brushy Canyon		0.00	179.75
8,608.13	8,607.00	Bone Spring Top		0.00	179.75
8,866.13	8,865.00	Bone Spring 1st Carbonate Top		0.00	179.75
9,072.13	9,071.00	Avalon A		0.00	179.75
9,274.13	9,273.00	Avalon B		0.00	179.75
9,423.13	9,422.00	Avalon C		0.00	179.75
9,717.13	9,716.00	Avalon D		0.00	179.75
9,759.13	9,758.00	1st Bone Spring Sand		0.00	179.75
9,971.13	9,970.00	FBS Shale		0.00	179.75
10,142.13	10,141.00	2nd Bone Spring Carbonate		0.00	179.75
10,299.13	10,298.00	2nd Bone Spring Sand		0.00	179.75
10,655.13	10,654.00	3rd Bone Spring Carbonate		0.00	179.75
11,576.83	11,249.00	3dBSC target landing		0.00	179.75

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,600.00	3,600.00	0.00	0.00	Build 1.5 / 100'
4,841.08	4,840.00	-47.46	17.27	Drop 1.5 / 100'
10,677.17	10,676.04	-50.87	18.52	KOP 10 / 100'
11,577.17	11,249.00	-623.82	21.01	EOC / Landing point