



Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB01
Design: Permitting Plan - Lateral V4

WELL DETAILS: Mesa Verde 17-8 Fed Com 14H

+N/-S
0.00

+E/-W
0.00

Northing
441092.92

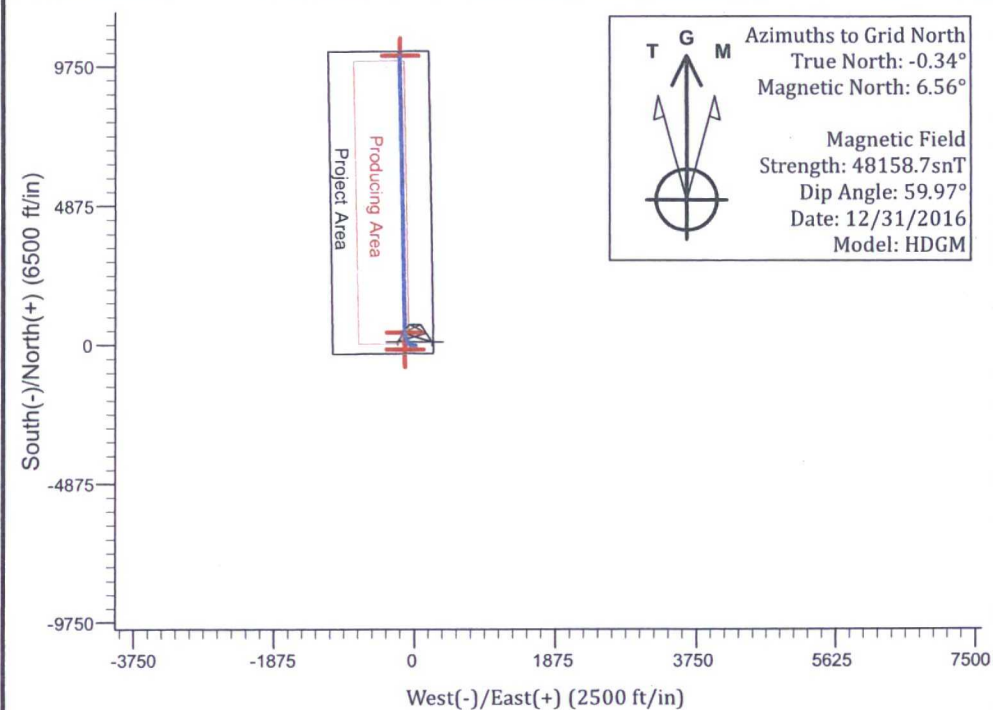
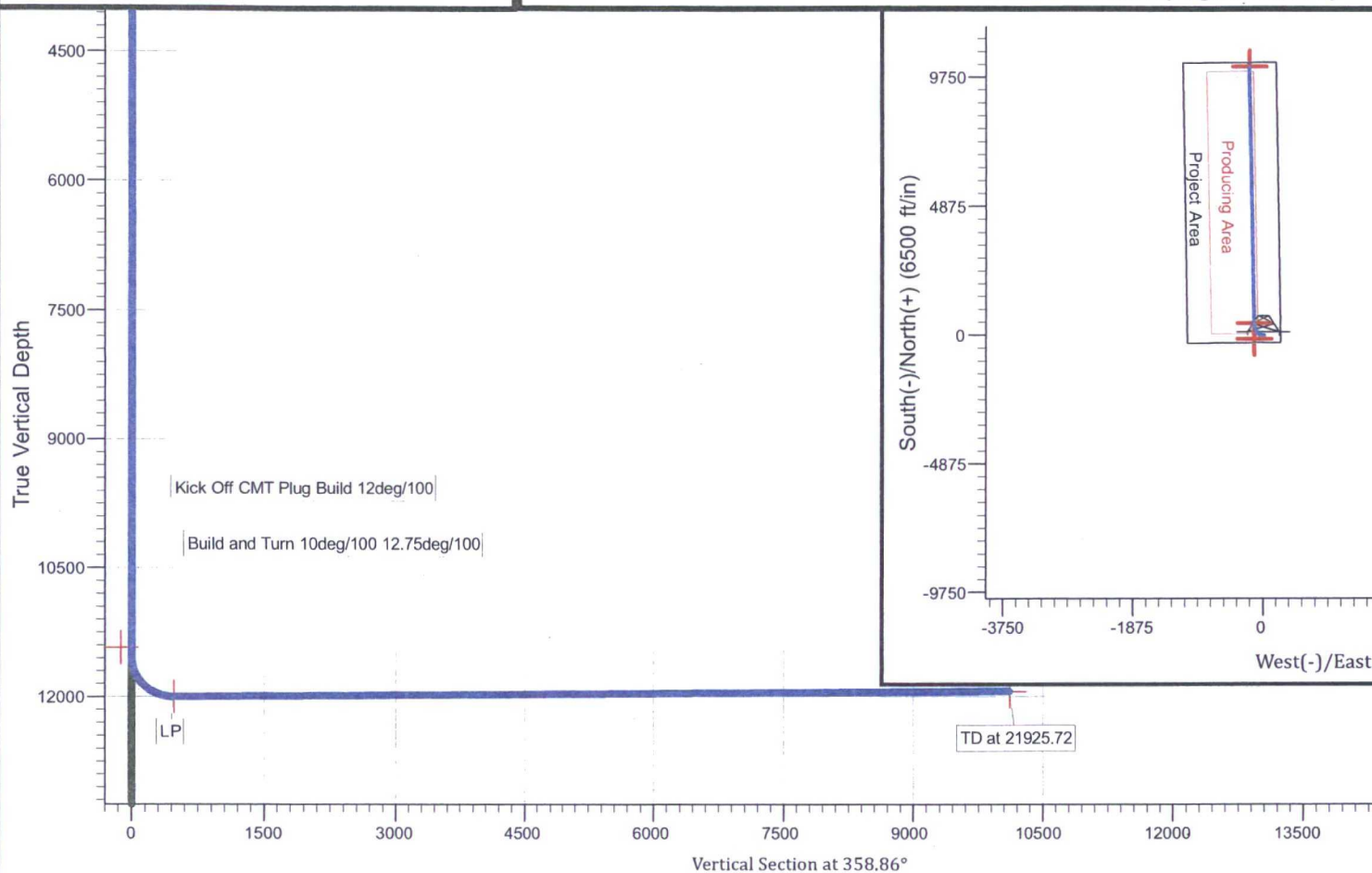
Ground Level: 3563.60

Easting
740622.60

Latitude
32° 12' 39.597165 N

Longitude
103° 41' 20.325623 W

WELL @ 3590.10ft (Original Well Elev)



Azimuths to Grid North
True North: -0.34°
Magnetic North: 6.56°
Magnetic Field
Strength: 48158.7snT
Dip Angle: 59.97°
Date: 12/31/2016
Model: HDGM

PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	11405.00	0.00	0.00	11405.00	0.00	0.00	0.00	0.00	0.00		Kick Off CMT Plug Build 12deg/100
2	11521.10	13.93	261.43	11519.96	-2.09	-13.89	12.00	261.43	-1.82		Build and Turn 10deg/100 12.75deg/100
3	12291.03	90.32	359.63	12000.00	477.48	-135.55	11.99	97.89	480.08		LP
4	21925.72	90.35	359.60	11944.00	10111.79	-200.57	0.00	-49.26	10113.78		TD at 21925.72

HOBBS OCD

OCT 03 2017

RECEIVED

ENGINEERING DESIGNS

PRD NM DIRECTIONAL PLANS (NAD 1983)

Mesa Verde 17-8 Fed Com

Mesa Verde 17-8 Fed Com 14H

WB00

Plan: Permitting Plan - Pilot Hole

Standard Planning Report

21 February, 2017

Oxy

Planning Report

Database: HOPSPP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB00
Design: Permitting Plan - Pilot Hole

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	PRD NM DIRECTIONAL PLANS (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site	Mesa Verde 17-8 Fed Com		
Site Position:		Northing:	441,093.32 usft
From:	Map	Easting:	739,872.60 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	32° 12' 39.645531 N
		Longitude:	103° 41' 29.055109 W
		Grid Convergence:	0.34 °

Well	Mesa Verde 17-8 Fed Com 14H		
Well Position	+N/-S	-0.40 ft	Northing:
	+E/-W	750.04 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	3,557.40 ft
		Latitude:	32° 12' 39.597165 N
		Longitude:	103° 41' 20.325623 W
		Ground Level:	3,563.60 ft

Wellbore	WB00				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/31/2016	6.88	60.00	48,175

Design	Permitting Plan - Pilot Hole			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	0.00

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
14,127.00	0.00	0.00	14,127.00	0.00	0.00	0.00	0.00	0.00	0.00	

Oxy

Planning Report

Database: HOPSP
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Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB00
Design: Permitting Plan - Pilot Hole

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
875.00	0.00	0.00	875.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
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
Salado									
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	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,713.00	0.00	0.00	4,713.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									

Oxy Planning Report

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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,757.00	0.00	0.00	4,757.00	0.00	0.00	0.00	0.00	0.00	0.00
Bell Canyon									
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,508.00	0.00	0.00	5,508.00	0.00	0.00	0.00	0.00	0.00	0.00
Cherry Canyon									
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,898.00	0.00	0.00	6,898.00	0.00	0.00	0.00	0.00	0.00	0.00
Brushy Canyon									
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,593.00	0.00	0.00	8,593.00	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring									
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00

Oxy

Planning Report

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Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
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9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00
9,672.00	0.00	0.00	9,672.00	0.00	0.00	0.00	0.00	0.00	0.00
1st Bone Spring									
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,839.00	0.00	0.00	9,839.00	0.00	0.00	0.00	0.00	0.00	0.00
2nd Bone Spring									
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	0.00	0.00	0.00	0.00	0.00	0.00
10,200.00	0.00	0.00	10,200.00	0.00	0.00	0.00	0.00	0.00	0.00
10,300.00	0.00	0.00	10,300.00	0.00	0.00	0.00	0.00	0.00	0.00
10,400.00	0.00	0.00	10,400.00	0.00	0.00	0.00	0.00	0.00	0.00
10,500.00	0.00	0.00	10,500.00	0.00	0.00	0.00	0.00	0.00	0.00
10,600.00	0.00	0.00	10,600.00	0.00	0.00	0.00	0.00	0.00	0.00
10,693.00	0.00	0.00	10,693.00	0.00	0.00	0.00	0.00	0.00	0.00
3rd Bone Spring									
10,700.00	0.00	0.00	10,700.00	0.00	0.00	0.00	0.00	0.00	0.00
10,800.00	0.00	0.00	10,800.00	0.00	0.00	0.00	0.00	0.00	0.00
10,895.00	0.00	0.00	10,895.00	0.00	0.00	0.00	0.00	0.00	0.00
Step out DL 2.00									
10,900.00	0.00	0.00	10,900.00	0.00	0.00	0.00	0.00	0.00	0.00
11,000.00	0.00	0.00	11,000.00	0.00	0.00	0.00	0.00	0.00	0.00
11,100.00	0.00	0.00	11,100.00	0.00	0.00	0.00	0.00	0.00	0.00
11,200.00	0.00	0.00	11,200.00	0.00	0.00	0.00	0.00	0.00	0.00
11,300.00	0.00	0.00	11,300.00	0.00	0.00	0.00	0.00	0.00	0.00
11,396.27	0.00	0.00	11,396.27	0.00	0.00	0.00	0.00	0.00	0.00
Hold 10deg Tangent									
11,400.00	0.00	0.00	11,400.00	0.00	0.00	0.00	0.00	0.00	0.00
11,500.00	0.00	0.00	11,500.00	0.00	0.00	0.00	0.00	0.00	0.00
11,600.00	0.00	0.00	11,600.00	0.00	0.00	0.00	0.00	0.00	0.00
11,700.00	0.00	0.00	11,700.00	0.00	0.00	0.00	0.00	0.00	0.00
11,800.00	0.00	0.00	11,800.00	0.00	0.00	0.00	0.00	0.00	0.00
11,900.00	0.00	0.00	11,900.00	0.00	0.00	0.00	0.00	0.00	0.00
11,905.00	0.00	0.00	11,905.00	0.00	0.00	0.00	0.00	0.00	0.00
Wolfcamp									
11,938.16	0.00	0.00	11,938.16	0.00	0.00	0.00	0.00	0.00	0.00
Drop back to vertical 2.00DLS									
12,000.00	0.00	0.00	12,000.00	0.00	0.00	0.00	0.00	0.00	0.00
12,100.00	0.00	0.00	12,100.00	0.00	0.00	0.00	0.00	0.00	0.00
12,200.00	0.00	0.00	12,200.00	0.00	0.00	0.00	0.00	0.00	0.00
12,300.00	0.00	0.00	12,300.00	0.00	0.00	0.00	0.00	0.00	0.00
12,400.00	0.00	0.00	12,400.00	0.00	0.00	0.00	0.00	0.00	0.00
12,439.42	0.00	0.00	12,439.42	0.00	0.00	0.00	0.00	0.00	0.00
Build Curve 10deg/100									
12,500.00	0.00	0.00	12,500.00	0.00	0.00	0.00	0.00	0.00	0.00
12,600.00	0.00	0.00	12,600.00	0.00	0.00	0.00	0.00	0.00	0.00
12,700.00	0.00	0.00	12,700.00	0.00	0.00	0.00	0.00	0.00	0.00
12,800.00	0.00	0.00	12,800.00	0.00	0.00	0.00	0.00	0.00	0.00
12,900.00	0.00	0.00	12,900.00	0.00	0.00	0.00	0.00	0.00	0.00
13,000.00	0.00	0.00	13,000.00	0.00	0.00	0.00	0.00	0.00	0.00

Oxy

Planning Report

Database: HOPSPP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB00
Design: Permitting Plan - Pilot Hole

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,100.00	0.00	0.00	13,100.00	0.00	0.00	0.00	0.00	0.00	0.00
13,200.00	0.00	0.00	13,200.00	0.00	0.00	0.00	0.00	0.00	0.00
13,300.00	0.00	0.00	13,300.00	0.00	0.00	0.00	0.00	0.00	0.00
13,342.42	0.00	0.00	13,342.42	0.00	0.00	0.00	0.00	0.00	0.00
Landing Point									
13,400.00	0.00	0.00	13,400.00	0.00	0.00	0.00	0.00	0.00	0.00
13,500.00	0.00	0.00	13,500.00	0.00	0.00	0.00	0.00	0.00	0.00
13,600.00	0.00	0.00	13,600.00	0.00	0.00	0.00	0.00	0.00	0.00
13,700.00	0.00	0.00	13,700.00	0.00	0.00	0.00	0.00	0.00	0.00
13,800.00	0.00	0.00	13,800.00	0.00	0.00	0.00	0.00	0.00	0.00
13,900.00	0.00	0.00	13,900.00	0.00	0.00	0.00	0.00	0.00	0.00
13,976.00	0.00	0.00	13,976.00	0.00	0.00	0.00	0.00	0.00	0.00
Strawn									
14,000.00	0.00	0.00	14,000.00	0.00	0.00	0.00	0.00	0.00	0.00
14,100.00	0.00	0.00	14,100.00	0.00	0.00	0.00	0.00	0.00	0.00
14,127.00	0.00	0.00	14,127.00	0.00	0.00	0.00	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
MV_17_8_14H_KOP - plan misses target center by 181.82ft at 12426.04ft MD (12426.04 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	12,426.04	-122.55	-134.32	440,970.38	740,488.29	32° 12' 38.392540 N	103° 41' 21.897449
MV_17_8_14H_BHL - plan misses target center by 10113.78ft at 12943.00ft MD (12943.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	12,943.00	10,111.79	-200.57	451,204.23	740,422.04	32° 14' 19.664886 N	103° 41' 21.954705

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
875.00		Rustler			
1,200.00		Salado			
4,713.00		Delaware			
4,757.00		Bell Canyon			
5,508.00		Cherry Canyon			
6,898.00		Brushy Canyon			
8,593.00		Bone Spring			
9,672.00		1st Bone Spring			
9,839.00		2nd Bone Spring			
10,693.00		3rd Bone Spring			
11,905.00		Wolfcamp			
13,976.00		Strawn			

Oxy
Planning Report

Database: HOPSPP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB00
Design: Permitting Plan - Pilot Hole

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
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MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,895.00	10,895.00	0.00	0.00	Step out DL 2.00
11,396.27	11,396.27	0.00	0.00	Hold 10deg Tangent
11,938.16	11,938.16	0.00	0.00	Drop back to vertical 2.00DLS
12,439.42	12,439.42	0.00	0.00	Build Curve 10deg/100
13,342.42	13,342.42	0.00	0.00	Landing Point
23,001.18				TD at 23001

ENGINEERING DESIGNS

PRD NM DIRECTIONAL PLANS (NAD 1983)

Mesa Verde 17-8 Fed Com

Mesa Verde 17-8 Fed Com 14H

WB01

Plan: Permitting Plan - Lateral V4

Standard Planning Report

13 July, 2017

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Oxy

Planning Report

Database: HOPSPP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB01
Design: Permitting Plan - Lateral V4

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	PRD NM DIRECTIONAL PLANS (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site	Mesa Verde 17-8 Fed Com		
Site Position:		Northing:	441,093.32 usft
From:	Map	Easting:	739,872.60 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13,200 in
		Latitude:	32° 12' 39.645531 N
		Longitude:	103° 41' 29.055109 W
		Grid Convergence:	0.34 °

Well	Mesa Verde 17-8 Fed Com 14H		
Well Position	+N/-S	-0.40 ft	Northing:
	+E/-W	750.04 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	3,557.40 ft
		Latitude:	32° 12' 39.597165 N
		Longitude:	103° 41' 20.325623 W
		Ground Level:	3,563.60 ft

Wellbore	WB01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/31/2016	6.90	59.97	48,159

Design	Permitting Plan - Lateral V4			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	11,405.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	358.86

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
11,405.00	0.00	0.00	11,405.00	0.00	0.00	0.00	0.00	0.00	0.00	
11,521.10	13.93	261.43	11,519.96	-2.09	-13.89	12.00	12.00	0.00	261.43	
12,291.03	90.32	359.63	12,000.00	477.48	-135.55	11.99	9.92	12.75	97.89	MV_18_8_14H_LP
21,925.72	90.35	359.60	11,944.00	10,111.79	-200.57	0.00	0.00	0.00	-49.26	MV_17-8_14H_BHL

Oxy

Planning Report

Database: HOPSP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB01
Design: Permitting Plan - Lateral V4

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,405.00	0.00	0.00	11,405.00	0.00	0.00	0.00	0.00	0.00	0.00
11,500.00	11.40	261.43	11,499.37	-1.40	-9.31	-1.22	12.00	12.00	0.00
11,521.10	13.93	261.43	11,519.96	-2.09	-13.89	-1.82	12.00	12.00	0.00
11,600.00	15.67	298.47	11,596.41	1.58	-32.69	2.23	11.99	2.21	46.95
11,700.00	23.73	325.58	11,690.67	24.70	-56.02	25.80	11.99	8.05	27.11
11,800.00	34.08	338.27	11,778.17	67.48	-77.85	69.01	11.99	10.36	12.69
11,900.00	45.18	345.43	11,855.11	128.05	-97.22	129.95	11.99	11.10	7.16
12,000.00	56.58	350.22	11,918.12	203.78	-113.29	205.98	11.99	11.40	4.80
12,100.00	68.12	353.89	11,964.46	291.36	-125.36	293.79	11.99	11.54	3.67
12,200.00	79.73	357.00	11,992.11	386.97	-132.90	389.53	11.99	11.61	3.11
12,291.03	90.32	359.63	12,000.00	477.48	-135.55	480.08	11.99	11.64	2.89
12,300.00	90.32	359.63	11,999.95	486.45	-135.60	489.05	0.00	0.00	0.00
12,400.00	90.32	359.63	11,999.39	586.45	-136.25	589.04	0.00	0.00	0.00
12,500.00	90.32	359.63	11,998.83	686.45	-136.90	689.03	0.00	0.00	0.00
12,600.00	90.32	359.63	11,998.27	786.44	-137.55	789.01	0.00	0.00	0.00
12,700.00	90.32	359.63	11,997.71	886.44	-138.20	889.00	0.00	0.00	0.00
12,800.00	90.32	359.63	11,997.15	986.43	-138.85	988.99	0.00	0.00	0.00
12,900.00	90.32	359.63	11,996.59	1,086.43	-139.50	1,088.98	0.00	0.00	0.00
13,000.00	90.32	359.63	11,996.03	1,186.43	-140.15	1,188.97	0.00	0.00	0.00
13,100.00	90.32	359.63	11,995.47	1,286.42	-140.81	1,288.96	0.00	0.00	0.00
13,200.00	90.32	359.63	11,994.91	1,386.42	-141.46	1,388.95	0.00	0.00	0.00
13,300.00	90.32	359.63	11,994.35	1,486.42	-142.11	1,488.94	0.00	0.00	0.00
13,400.00	90.32	359.63	11,993.78	1,586.41	-142.77	1,588.93	0.00	0.00	0.00
13,500.00	90.32	359.62	11,993.22	1,686.41	-143.42	1,688.92	0.00	0.00	0.00
13,600.00	90.32	359.62	11,992.65	1,786.40	-144.08	1,788.91	0.00	0.00	0.00
13,700.00	90.32	359.62	11,992.09	1,886.40	-144.73	1,888.90	0.00	0.00	0.00
13,800.00	90.32	359.62	11,991.52	1,986.40	-145.39	1,988.89	0.00	0.00	0.00
13,900.00	90.32	359.62	11,990.96	2,086.39	-146.04	2,088.88	0.00	0.00	0.00
14,000.00	90.32	359.62	11,990.39	2,186.39	-146.70	2,188.87	0.00	0.00	0.00
14,100.00	90.32	359.62	11,989.83	2,286.39	-147.36	2,288.86	0.00	0.00	0.00
14,200.00	90.33	359.62	11,989.26	2,386.38	-148.02	2,388.85	0.00	0.00	0.00
14,300.00	90.33	359.62	11,988.69	2,486.38	-148.68	2,488.84	0.00	0.00	0.00
14,400.00	90.33	359.62	11,988.12	2,586.37	-149.34	2,588.83	0.00	0.00	0.00
14,500.00	90.33	359.62	11,987.56	2,686.37	-150.00	2,688.82	0.00	0.00	0.00
14,600.00	90.33	359.62	11,986.99	2,786.37	-150.66	2,788.81	0.00	0.00	0.00
14,700.00	90.33	359.62	11,986.42	2,886.36	-151.32	2,888.80	0.00	0.00	0.00
14,800.00	90.33	359.62	11,985.85	2,986.36	-151.98	2,988.79	0.00	0.00	0.00
14,900.00	90.33	359.62	11,985.28	3,086.36	-152.64	3,088.78	0.00	0.00	0.00
15,000.00	90.33	359.62	11,984.71	3,186.35	-153.31	3,188.77	0.00	0.00	0.00
15,100.00	90.33	359.62	11,984.13	3,286.35	-153.97	3,288.75	0.00	0.00	0.00
15,200.00	90.33	359.62	11,983.56	3,386.34	-154.63	3,388.74	0.00	0.00	0.00
15,300.00	90.33	359.62	11,982.99	3,486.34	-155.30	3,488.73	0.00	0.00	0.00
15,400.00	90.33	359.62	11,982.42	3,586.34	-155.96	3,588.72	0.00	0.00	0.00
15,500.00	90.33	359.62	11,981.84	3,686.33	-156.63	3,688.71	0.00	0.00	0.00
15,600.00	90.33	359.62	11,981.27	3,786.33	-157.29	3,788.70	0.00	0.00	0.00
15,700.00	90.33	359.62	11,980.70	3,886.32	-157.96	3,888.69	0.00	0.00	0.00
15,800.00	90.33	359.62	11,980.12	3,986.32	-158.63	3,988.68	0.00	0.00	0.00
15,900.00	90.33	359.62	11,979.55	4,086.32	-159.30	4,088.67	0.00	0.00	0.00
16,000.00	90.33	359.62	11,978.97	4,186.31	-159.96	4,188.66	0.00	0.00	0.00
16,100.00	90.33	359.62	11,978.39	4,286.31	-160.63	4,288.65	0.00	0.00	0.00
16,200.00	90.33	359.62	11,977.82	4,386.31	-161.30	4,388.64	0.00	0.00	0.00
16,300.00	90.33	359.62	11,977.24	4,486.30	-161.97	4,488.63	0.00	0.00	0.00
16,400.00	90.33	359.62	11,976.66	4,586.30	-162.64	4,588.62	0.00	0.00	0.00
16,500.00	90.33	359.62	11,976.09	4,686.29	-163.31	4,688.61	0.00	0.00	0.00

Oxy

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Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,600.00	90.33	359.61	11,975.51	4,786.29	-163.99	4,788.60	0.00	0.00	0.00
16,700.00	90.33	359.61	11,974.93	4,886.29	-164.66	4,888.59	0.00	0.00	0.00
16,800.00	90.33	359.61	11,974.35	4,986.28	-165.33	4,988.58	0.00	0.00	0.00
16,900.00	90.33	359.61	11,973.77	5,086.28	-166.00	5,088.57	0.00	0.00	0.00
17,000.00	90.33	359.61	11,973.19	5,186.27	-166.68	5,188.56	0.00	0.00	0.00
17,100.00	90.33	359.61	11,972.61	5,286.27	-167.35	5,288.55	0.00	0.00	0.00
17,200.00	90.33	359.61	11,972.03	5,386.27	-168.03	5,388.54	0.00	0.00	0.00
17,300.00	90.33	359.61	11,971.44	5,486.26	-168.70	5,488.53	0.00	0.00	0.00
17,400.00	90.33	359.61	11,970.86	5,586.26	-169.38	5,588.52	0.00	0.00	0.00
17,500.00	90.33	359.61	11,970.28	5,686.25	-170.06	5,688.51	0.00	0.00	0.00
17,600.00	90.33	359.61	11,969.70	5,786.25	-170.73	5,788.50	0.00	0.00	0.00
17,700.00	90.33	359.61	11,969.11	5,886.25	-171.41	5,888.49	0.00	0.00	0.00
17,800.00	90.33	359.61	11,968.53	5,986.24	-172.09	5,988.48	0.00	0.00	0.00
17,900.00	90.34	359.61	11,967.94	6,086.24	-172.77	6,088.47	0.00	0.00	0.00
18,000.00	90.34	359.61	11,967.36	6,186.23	-173.45	6,188.46	0.00	0.00	0.00
18,100.00	90.34	359.61	11,966.77	6,286.23	-174.13	6,288.45	0.00	0.00	0.00
18,200.00	90.34	359.61	11,966.18	6,386.23	-174.81	6,388.44	0.00	0.00	0.00
18,300.00	90.34	359.61	11,965.60	6,486.22	-175.49	6,488.43	0.00	0.00	0.00
18,400.00	90.34	359.61	11,965.01	6,586.22	-176.17	6,588.42	0.00	0.00	0.00
18,500.00	90.34	359.61	11,964.42	6,686.21	-176.86	6,688.41	0.00	0.00	0.00
18,600.00	90.34	359.61	11,963.84	6,786.21	-177.54	6,788.40	0.00	0.00	0.00
18,700.00	90.34	359.61	11,963.25	6,886.21	-178.22	6,888.39	0.00	0.00	0.00
18,800.00	90.34	359.61	11,962.66	6,986.20	-178.91	6,988.38	0.00	0.00	0.00
18,900.00	90.34	359.61	11,962.07	7,086.20	-179.59	7,088.37	0.00	0.00	0.00
19,000.00	90.34	359.61	11,961.48	7,186.19	-180.28	7,188.36	0.00	0.00	0.00
19,100.00	90.34	359.61	11,960.89	7,286.19	-180.96	7,288.34	0.00	0.00	0.00
19,200.00	90.34	359.61	11,960.30	7,386.19	-181.65	7,388.33	0.00	0.00	0.00
19,300.00	90.34	359.61	11,959.70	7,486.18	-182.34	7,488.32	0.00	0.00	0.00
19,400.00	90.34	359.61	11,959.11	7,586.18	-183.02	7,588.31	0.00	0.00	0.00
19,500.00	90.34	359.61	11,958.52	7,686.17	-183.71	7,688.30	0.00	0.00	0.00
19,600.00	90.34	359.61	11,957.93	7,786.17	-184.40	7,788.29	0.00	0.00	0.00
19,700.00	90.34	359.61	11,957.33	7,886.16	-185.09	7,888.28	0.00	0.00	0.00
19,800.00	90.34	359.60	11,956.74	7,986.16	-185.78	7,988.27	0.00	0.00	0.00
19,900.00	90.34	359.60	11,956.15	8,086.16	-186.47	8,088.26	0.00	0.00	0.00
20,000.00	90.34	359.60	11,955.55	8,186.15	-187.16	8,188.25	0.00	0.00	0.00
20,100.00	90.34	359.60	11,954.95	8,286.15	-187.85	8,288.24	0.00	0.00	0.00
20,200.00	90.34	359.60	11,954.36	8,386.14	-188.54	8,388.23	0.00	0.00	0.00
20,300.00	90.34	359.60	11,953.76	8,486.14	-189.23	8,488.22	0.00	0.00	0.00
20,400.00	90.34	359.60	11,953.17	8,586.14	-189.93	8,588.21	0.00	0.00	0.00
20,500.00	90.34	359.60	11,952.57	8,686.13	-190.62	8,688.20	0.00	0.00	0.00
20,600.00	90.34	359.60	11,951.97	8,786.13	-191.31	8,788.19	0.00	0.00	0.00
20,700.00	90.34	359.60	11,951.37	8,886.12	-192.01	8,888.18	0.00	0.00	0.00
20,800.00	90.34	359.60	11,950.77	8,986.12	-192.70	8,988.17	0.00	0.00	0.00
20,900.00	90.34	359.60	11,950.17	9,086.11	-193.40	9,088.16	0.00	0.00	0.00
21,000.00	90.34	359.60	11,949.57	9,186.11	-194.10	9,188.15	0.00	0.00	0.00
21,100.00	90.34	359.60	11,948.97	9,286.11	-194.79	9,288.14	0.00	0.00	0.00
21,200.00	90.34	359.60	11,948.37	9,386.10	-195.49	9,388.13	0.00	0.00	0.00
21,300.00	90.34	359.60	11,947.77	9,486.10	-196.19	9,488.12	0.00	0.00	0.00
21,400.00	90.34	359.60	11,947.17	9,586.09	-196.89	9,588.11	0.00	0.00	0.00
21,500.00	90.35	359.60	11,946.57	9,686.09	-197.59	9,688.10	0.00	0.00	0.00
21,600.00	90.35	359.60	11,945.97	9,786.08	-198.29	9,788.09	0.00	0.00	0.00
21,700.00	90.35	359.60	11,945.36	9,886.08	-198.99	9,888.08	0.00	0.00	0.00
21,800.00	90.35	359.60	11,944.76	9,986.08	-199.69	9,988.07	0.00	0.00	0.00
21,900.00	90.35	359.60	11,944.16	10,086.07	-200.39	10,088.06	0.00	0.00	0.00

Oxy

Planning Report

Database: HOPSPP
Company: ENGINEERING DESIGNS
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 17-8 Fed Com
Well: Mesa Verde 17-8 Fed Com 14H
Wellbore: WB01
Design: Permitting Plan - Lateral V4

Local Co-ordinate Reference: Well Mesa Verde 17-8 Fed Com 14H
TVD Reference: WELL @ 3590.10ft (Original Well Elev)
MD Reference: WELL @ 3590.10ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
21,925.72	90.35	359.60	11,944.00	10,111.79	-200.57	10,113.78	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
MV_17-8_14H_KOP2 - plan misses target center by 181.25ft at 11441.96ft MD (11441.92 TVD, -0.21 N, -1.41 E) - Point	0.00	0.00	11,427.00	-122.55	-134.32	440,970.38	740,488.29	32° 12' 38.392540 N	103° 41' 21.897449
MV_17-8_14H_BHL2 - plan hits target center - Point	0.00	0.00	11,944.00	10,111.79	-200.57	451,204.23	740,422.04	32° 14' 19.664886 N	103° 41' 21.954705
MV_18_8_14H_LP - plan hits target center - Point	0.00	0.01	12,000.00	477.48	-135.55	441,570.38	740,487.06	32° 12' 44.329888 N	103° 41' 21.869927

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,405.00	11,405.00	0.00	0.00	Kick Off CMT Plug Build 12deg/100
11,521.10	11,519.96	-2.09	-13.89	Build and Turn 10deg/100 12.75deg/100
12,291.03	12,000.00	477.48	-135.55	LP
21,925.72	11,944.00	10,111.79	-200.57	TD at 21925.72