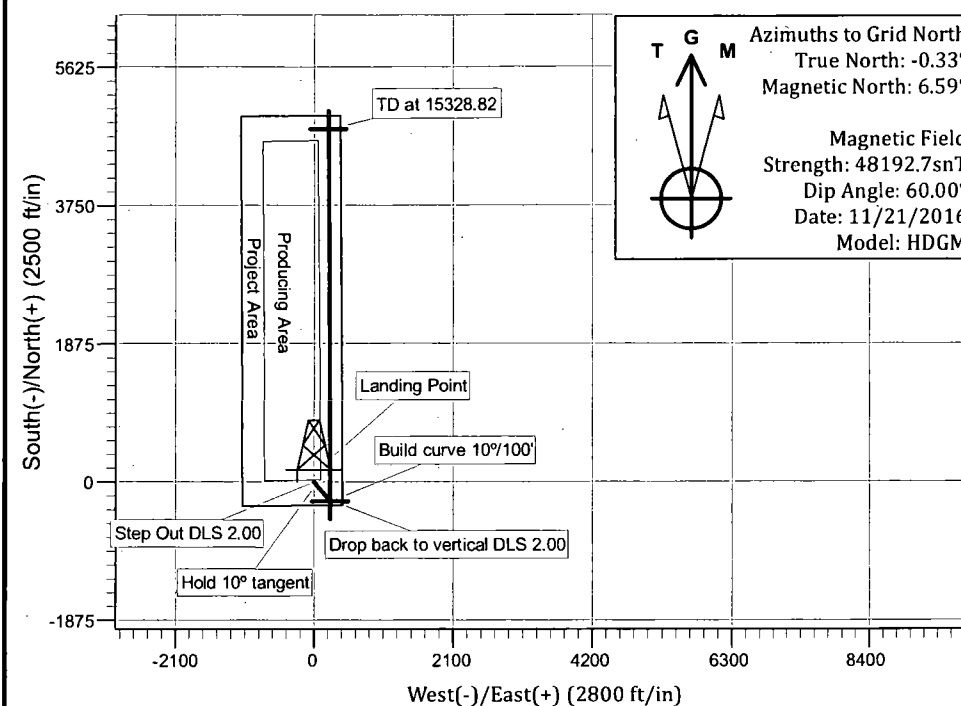
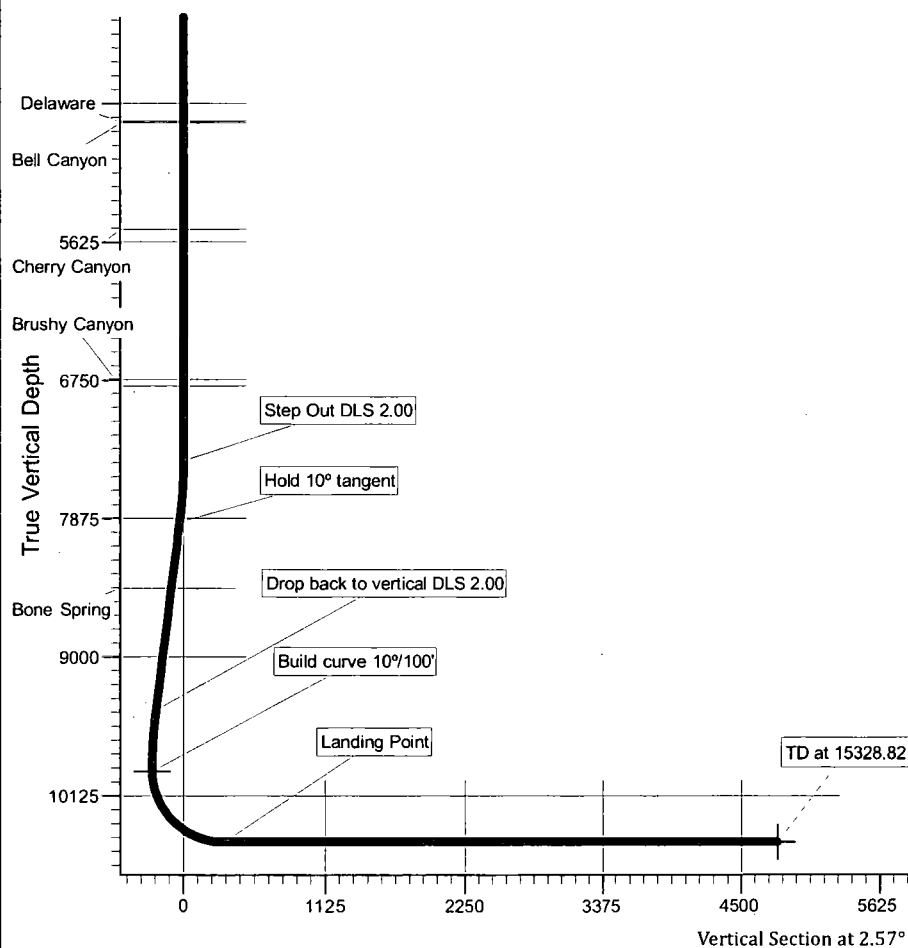




Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 18 Fed Com
Well: Mesa Verde 18 Federal 2H
Wellbore: WB00
Design: Permitting Plan

WELL DETAILS: Mesa Verde 18 Federal 2H

Ground Level: 3572.60	WELL @ 3599.10ft (Original Well Elev)				
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	441030.17	731184.81	32° 12' 39.522834 N	103° 43' 10.179925 W



Azimuths to Grid North
True North: -0.33°
Magnetic North: 6.59°
Magnetic Field
Strength: 48192.7snT
Dip Angle: 60.00°
Date: 11/21/2016
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

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
7409.00	7409.00	0.00	0.00	0.00	0.00	0.00	0.00	Step Out DLS 2.00
7906.51	7909.05	10.00	136.46	-31.55	29.99	-30.18	43.53	Hold 10° tangent
9428.53	9454.54	10.00	136.46	-226.11	214.88	-216.23	311.93	Drop back to vertical DLS 2.00
9926.04	9954.60	0.00	359.66	-257.66	244.87	-246.41	355.46	Build curve 10°/100'
10499.00	10854.60	90.00	359.66	315.28	241.52	325.81	928.42	Landing Point
10499.00	15328.82	90.00	359.66	4789.44	215.31	4794.27	5402.65	TD at 15328.82

OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)

Mesa Verde 18 Fed Com

Mesa Verde 18 Federal 2H

WB00

Plan: Permitting Plan

Standard Planning Report

21 November, 2016

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ARTESIA DISTRICT

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Oxy Planning Report

Database:	HOPSP	Local Co-ordinate Reference:	Well Mesa Verde 18 Federal 2H
Company:	OXY	TVD Reference:	WELL @ 3599.10ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3599.10ft (Original Well Elev)
Site:	Mesa Verde 18 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18 Federal 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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 18 Fed Com		
Site Position:		Northing:	441,000.17 usft
From:	Map	Easting:	731,185.03 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	32° 12' 39.225956 N
		Longitude:	103° 43' 10.179359 W
		Grid Convergence:	0.33 °

Well	Mesa Verde 18 Federal 2H		
Well Position	+N/-S	30.00 ft	Northing: 441,030.17 usft
	+E/-W	-0.22 ft	Easting: 731,184.81 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	3,572.60 ft
		Latitude:	32° 12' 39.522834 N
		Longitude:	103° 43' 10.179925 W
		Ground Level:	3,572.60 ft

Wellbore	WB00		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	11/21/2016	6.92
			Dip Angle (°)
			60.00
			Field Strength (nT)
			48,193

Design	Permitting Plan		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			2.57

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	
7,409.00	0.00	0.00	7,409.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,909.05	10.00	136.46	7,906.52	-31.55	29.99	2.00	2.00	0.00	136.46	
9,454.54	10.00	136.46	9,428.53	-226.11	214.88	0.00	0.00	0.00	0.00	
9,954.60	0.00	359.66	9,926.04	-257.66	244.87	2.00	-2.00	0.00	180.00	MV18_2H_KOP
10,854.60	90.00	359.66	10,499.00	315.28	241.52	10.00	10.00	0.00	-0.34	
15,328.82	90.00	359.66	10,499.00	4,789.44	215.31	0.00	0.00	0.00	0.00	MV18_2H_BHL

Oxy Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Mesa Verde 18 Federal 2H
Company:	OXY	TVD Reference:	WELL @ 3599.10ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3599.10ft (Original Well Elev)
Site:	Mesa Verde 18 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18 Federal 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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
946.00	0.00	0.00	946.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,061.00	0.00	0.00	1,061.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
3,332.00	0.00	0.00	3,332.00	0.00	0.00	0.00	0.00	0.00	0.00
Castile									
4,643.00	0.00	0.00	4,643.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
4,658.00	0.00	0.00	4,658.00	0.00	0.00	0.00	0.00	0.00	0.00
Bell Canyon									
5,525.00	0.00	0.00	5,525.00	0.00	0.00	0.00	0.00	0.00	0.00
Cherry Canyon									
6,804.00	0.00	0.00	6,804.00	0.00	0.00	0.00	0.00	0.00	0.00
Brushy Canyon									
7,409.00	0.00	0.00	7,409.00	0.00	0.00	0.00	0.00	0.00	0.00
Step Out DLS 2.00									
7,500.00	1.82	136.46	7,499.98	-1.05	1.00	-1.00	2.00	2.00	0.00
7,600.00	3.82	136.46	7,599.86	-4.61	4.38	-4.41	2.00	2.00	0.00
7,700.00	5.82	136.46	7,699.50	-10.70	10.17	-10.24	2.00	2.00	0.00
7,800.00	7.82	136.46	7,798.79	-19.31	18.35	-18.47	2.00	2.00	0.00
7,900.00	9.82	136.46	7,897.60	-30.43	28.92	-29.10	2.00	2.00	0.00
7,909.05	10.00	136.46	7,906.52	-31.55	29.99	-30.18	2.00	2.00	0.00
Hold 10° tangent									
8,000.00	10.00	136.46	7,996.08	-43.00	40.87	-41.12	0.00	0.00	0.00
8,100.00	10.00	136.46	8,094.56	-55.59	52.83	-53.16	0.00	0.00	0.00
8,200.00	10.00	136.46	8,193.04	-68.18	64.80	-65.20	0.00	0.00	0.00
8,300.00	10.00	136.46	8,291.52	-80.77	76.76	-77.24	0.00	0.00	0.00
8,400.00	10.00	136.46	8,390.00	-93.36	88.72	-89.28	0.00	0.00	0.00
8,454.83	10.00	136.46	8,444.00	-100.26	95.28	-95.88	0.00	0.00	0.00
Bone Spring									
8,500.00	10.00	136.46	8,488.49	-105.95	100.69	-101.32	0.00	0.00	0.00
8,600.00	10.00	136.46	8,586.97	-118.53	112.65	-113.36	0.00	0.00	0.00
8,700.00	10.00	136.46	8,685.45	-131.12	124.61	-125.39	0.00	0.00	0.00
8,800.00	10.00	136.46	8,783.93	-143.71	136.58	-137.43	0.00	0.00	0.00
8,900.00	10.00	136.46	8,882.41	-156.30	148.54	-149.47	0.00	0.00	0.00
9,000.00	10.00	136.46	8,980.89	-168.89	160.50	-161.51	0.00	0.00	0.00
9,100.00	10.00	136.46	9,079.37	-181.48	172.47	-173.55	0.00	0.00	0.00
9,200.00	10.00	136.46	9,177.85	-194.07	184.43	-185.59	0.00	0.00	0.00
9,300.00	10.00	136.46	9,276.33	-206.65	196.40	-197.63	0.00	0.00	0.00
9,400.00	10.00	136.46	9,374.81	-219.24	208.36	-209.66	0.00	0.00	0.00
9,454.54	10.00	136.46	9,428.53	-226.11	214.88	-216.23	0.00	0.00	0.00
Drop back to vertical DLS 2.00									
9,500.00	9.09	136.46	9,473.35	-231.57	220.08	-221.46	2.00	-2.00	0.00
9,600.00	7.09	136.46	9,572.35	-241.78	229.77	-231.21	2.00	-2.00	0.00
9,700.00	5.09	136.46	9,671.78	-249.47	237.08	-238.57	2.00	-2.00	0.00
9,800.00	3.09	136.46	9,771.52	-254.64	242.00	-243.52	2.00	-2.00	0.00
9,900.00	1.09	136.46	9,871.45	-257.29	244.51	-246.05	2.00	-2.00	0.00
9,954.60	0.00	359.66	9,926.04	-257.66	244.87	-246.41	2.00	-2.00	0.00
Build curve 10°/100' - MV18_2H_KOP									
10,000.00	4.54	359.66	9,971.40	-255.87	244.86	-244.61	10.00	10.00	0.00
10,100.00	14.54	359.66	10,069.89	-239.31	244.77	-228.08	10.00	10.00	0.00

Oxy Planning Report

Database:	HOPSP	Local Co-ordinate Reference:	Well Mesa Verde 18 Federal 2H
Company:	OXY	TVD Reference:	WELL @ 3599.10ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3599.10ft (Original Well Elev)
Site:	Mesa Verde 18 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18 Federal 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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)
10,200.00	24.54	359.66	10,164.01	-205.91	244.57	-194.72	10.00	10.00	0.00
10,300.00	34.54	359.66	10,250.90	-156.67	244.28	-145.54	10.00	10.00	0.00
10,400.00	44.54	359.66	10,327.92	-93.09	243.91	-82.04	10.00	10.00	0.00
10,500.00	54.54	359.66	10,392.73	-17.10	243.46	-6.15	10.00	10.00	0.00
10,600.00	64.54	359.66	10,443.36	68.99	242.96	79.83	10.00	10.00	0.00
10,700.00	74.54	359.66	10,478.27	162.56	242.41	173.28	10.00	10.00	0.00
10,800.00	84.54	359.66	10,496.40	260.77	241.84	271.37	10.00	10.00	0.00
10,854.60	90.00	359.66	10,499.00	315.28	241.52	325.81	10.00	10.00	0.00
Landing Point									
10,900.00	90.00	359.66	10,499.00	360.69	241.25	371.16	0.00	0.00	0.00
11,000.00	90.00	359.66	10,499.00	460.69	240.67	471.03	0.00	0.00	0.00
11,100.00	90.00	359.66	10,499.00	560.69	240.08	570.90	0.00	0.00	0.00
11,200.00	90.00	359.66	10,499.00	660.68	239.49	670.77	0.00	0.00	0.00
11,300.00	90.00	359.66	10,499.00	760.68	238.91	770.64	0.00	0.00	0.00
11,400.00	90.00	359.66	10,499.00	860.68	238.32	870.51	0.00	0.00	0.00
11,500.00	90.00	359.66	10,499.00	960.68	237.74	970.39	0.00	0.00	0.00
11,600.00	90.00	359.66	10,499.00	1,060.68	237.15	1,070.26	0.00	0.00	0.00
11,700.00	90.00	359.66	10,499.00	1,160.68	236.57	1,170.13	0.00	0.00	0.00
11,800.00	90.00	359.66	10,499.00	1,260.67	235.98	1,270.00	0.00	0.00	0.00
11,900.00	90.00	359.66	10,499.00	1,360.67	235.39	1,369.87	0.00	0.00	0.00
12,000.00	90.00	359.66	10,499.00	1,460.67	234.81	1,469.74	0.00	0.00	0.00
12,100.00	90.00	359.66	10,499.00	1,560.67	234.22	1,569.61	0.00	0.00	0.00
12,200.00	90.00	359.66	10,499.00	1,660.67	233.64	1,669.48	0.00	0.00	0.00
12,300.00	90.00	359.66	10,499.00	1,760.66	233.05	1,769.35	0.00	0.00	0.00
12,400.00	90.00	359.66	10,499.00	1,860.66	232.47	1,869.23	0.00	0.00	0.00
12,500.00	90.00	359.66	10,499.00	1,960.66	231.88	1,969.10	0.00	0.00	0.00
12,600.00	90.00	359.66	10,499.00	2,060.66	231.29	2,068.97	0.00	0.00	0.00
12,700.00	90.00	359.66	10,499.00	2,160.66	230.71	2,168.84	0.00	0.00	0.00
12,800.00	90.00	359.66	10,499.00	2,260.66	230.12	2,268.71	0.00	0.00	0.00
12,900.00	90.00	359.66	10,499.00	2,360.65	229.54	2,368.58	0.00	0.00	0.00
13,000.00	90.00	359.66	10,499.00	2,460.65	228.95	2,468.45	0.00	0.00	0.00
13,100.00	90.00	359.66	10,499.00	2,560.65	228.37	2,568.32	0.00	0.00	0.00
13,200.00	90.00	359.66	10,499.00	2,660.65	227.78	2,668.19	0.00	0.00	0.00
13,300.00	90.00	359.66	10,499.00	2,760.65	227.19	2,768.07	0.00	0.00	0.00
13,400.00	90.00	359.66	10,499.00	2,860.65	226.61	2,867.94	0.00	0.00	0.00
13,500.00	90.00	359.66	10,499.00	2,960.64	226.02	2,967.81	0.00	0.00	0.00
13,600.00	90.00	359.66	10,499.00	3,060.64	225.44	3,067.68	0.00	0.00	0.00
13,700.00	90.00	359.66	10,499.00	3,160.64	224.85	3,167.55	0.00	0.00	0.00
13,800.00	90.00	359.66	10,499.00	3,260.64	224.27	3,267.42	0.00	0.00	0.00
13,900.00	90.00	359.66	10,499.00	3,360.64	223.68	3,367.29	0.00	0.00	0.00
14,000.00	90.00	359.66	10,499.00	3,460.64	223.09	3,467.16	0.00	0.00	0.00
14,100.00	90.00	359.66	10,499.00	3,560.63	222.51	3,567.03	0.00	0.00	0.00
14,200.00	90.00	359.66	10,499.00	3,660.63	221.92	3,666.91	0.00	0.00	0.00
14,300.00	90.00	359.66	10,499.00	3,760.63	221.34	3,766.78	0.00	0.00	0.00
14,400.00	90.00	359.66	10,499.00	3,860.63	220.75	3,866.65	0.00	0.00	0.00
14,500.00	90.00	359.66	10,499.00	3,960.63	220.17	3,966.52	0.00	0.00	0.00
14,600.00	90.00	359.66	10,499.00	4,060.63	219.58	4,066.39	0.00	0.00	0.00
14,700.00	90.00	359.66	10,499.00	4,160.62	218.99	4,166.26	0.00	0.00	0.00
14,800.00	90.00	359.66	10,499.00	4,260.62	218.41	4,266.13	0.00	0.00	0.00
14,900.00	90.00	359.66	10,499.00	4,360.62	217.82	4,366.00	0.00	0.00	0.00
15,000.00	90.00	359.66	10,499.00	4,460.62	217.24	4,465.87	0.00	0.00	0.00
15,100.00	90.00	359.66	10,499.00	4,560.62	216.65	4,565.75	0.00	0.00	0.00
15,200.00	90.00	359.66	10,499.00	4,660.62	216.07	4,665.62	0.00	0.00	0.00
15,300.00	90.00	359.66	10,499.00	4,760.61	215.48	4,765.49	0.00	0.00	0.00

Oxy Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Mesa Verde 18 Federal 2H
Company:	OXY	TVD Reference:	WELL @ 3599.10ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3599.10ft (Original Well Elev)
Site:	Mesa Verde 18 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18 Federal 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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)
15,328.82	90.00	359.66	10,499.00	4,789.44	215.31	4,794.27	0.00	0.00	0.00
TD at 15328.82 - MV18_2H_BHL									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	
MV18_2H_KOP	- plan hits target center	0.00	0.00	9,926.04	-257.66	244.87	440,772.52	731,429.67	32° 12' 36.959408 N 103° 43' 7.347047
	- Point								
MV18_2H_BHL	- plan hits target center	0.00	0.00	10,499.00	4,789.44	215.31	445,819.36	731,400.11	32° 13' 26.902108 N 103° 43' 7.355148
	- Point								

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
946.00	946.00	Rustler				
1,061.00	1,061.00	Salado				
3,332.00	3,332.00	Castile				
4,643.00	4,643.00	Delaware				
4,658.00	4,658.00	Bell Canyon				
5,525.00	5,525.00	Cherry Canyon				
6,804.00	6,804.00	Brushy Canyon				
8,454.83	8,444.00	Bone Spring				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,409.00	7,409.00	0.00	0.00	Step Out DLS 2.00
7,909.05	7,906.52	-31.55	29.99	Hold 10° tangent
9,454.54	9,428.53	-226.11	214.88	Drop back to vertical DLS 2.00
9,954.60	9,926.04	-257.66	244.87	Build curve 10°/100'
10,854.60	10,499.00	315.28	241.52	Landing Point
15,328.82	10,499.00	4,789.44	215.31	TD at 15328.82