

Company: Marathon Oil
Project: Eddy County, NM
Site: Whistle Pig Fee 25-28-1
Well: TB #5H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Well TB #5H
TVD Reference: Well @ 2939.00usft (GL: 2912' + KB: 27' (Precision582))
MD Reference: Well @ 2939.00usft (GL: 2912' + KB: 27' (Precision582))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Project	Eddy 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	Whistle Pig Fee 25-28-1			
Site Position:		Northing:	424,067.27 usft	Latitude: 32.165525
From: Map		Easting:	592,517.05 usft	Longitude: -104.034349
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.16 °

Well	TB #5H			
Well Position	+N/-S	0.00 usft	Northing:	424,067.27 usft
	+E/-W	0.00 usft	Easting:	592,547.05 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level: 2,912.00 usft

Wellbore	OH			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)
	HDGM	8/3/2018	7.10	59.92
				Field Strength (nT) 47,969.70

Design	Prelim Plan A			
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	179.98

Survey Tool Program	Date 8/3/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
5,400.00	10,000.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
10,000.00	14,482.47	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1

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)
0.00	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



Pro Directional Survey Report



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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)
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	2.00	311.53	1,599.98	1.16	-1.31	-1.16	2.00	2.00	0.00
1,700.00	4.00	311.53	1,699.84	4.63	-5.22	-4.63	2.00	2.00	0.00
1,800.00	6.00	311.53	1,799.45	10.41	-11.75	-10.41	2.00	2.00	0.00
1,900.00	8.00	311.53	1,898.70	18.49	-20.87	-18.49	2.00	2.00	0.00
2,000.00	10.00	311.53	1,997.47	28.86	-32.58	-28.87	2.00	2.00	0.00
2,100.00	10.00	311.53	2,095.95	40.37	-45.58	-40.39	0.00	0.00	0.00
2,200.00	10.00	311.53	2,194.43	51.89	-58.58	-51.91	0.00	0.00	0.00
2,300.00	10.00	311.53	2,292.91	63.40	-71.58	-63.42	0.00	0.00	0.00
2,400.00	10.00	311.53	2,391.39	74.91	-84.57	-74.94	0.00	0.00	0.00
2,500.00	10.00	311.53	2,489.87	86.43	-97.57	-86.46	0.00	0.00	0.00
2,600.00	10.00	311.53	2,588.35	97.94	-110.57	-97.98	0.00	0.00	0.00
2,700.00	10.00	311.53	2,686.83	109.46	-123.57	-109.50	0.00	0.00	0.00
2,800.00	10.00	311.53	2,785.31	120.97	-136.57	-121.02	0.00	0.00	0.00
2,900.00	10.00	311.53	2,883.79	132.48	-149.57	-132.54	0.00	0.00	0.00
3,000.00	10.00	311.53	2,982.27	144.00	-162.57	-144.05	0.00	0.00	0.00
3,100.00	10.00	311.53	3,080.75	155.51	-175.57	-155.57	0.00	0.00	0.00
3,200.00	10.00	311.53	3,179.23	167.02	-188.56	-167.09	0.00	0.00	0.00
3,229.51	10.00	311.53	3,208.29	170.42	-192.40	-170.49	0.00	0.00	0.00
3,300.00	8.59	311.53	3,277.86	177.97	-200.92	-178.04	2.00	-2.00	0.00
3,400.00	6.59	311.53	3,376.98	186.73	-210.81	-186.80	2.00	-2.00	0.00
3,500.00	4.59	311.53	3,476.50	193.19	-218.10	-193.26	2.00	-2.00	0.00
3,600.00	2.59	311.53	3,576.30	197.34	-222.79	-197.42	2.00	-2.00	0.00
3,700.00	0.59	311.53	3,676.25	199.18	-224.87	-199.26	2.00	-2.00	0.00
3,729.51	0.00	0.00	3,705.76	199.28	-224.98	-199.36	2.00	-2.00	0.00
3,800.00	0.00	0.00	3,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
3,900.00	0.00	0.00	3,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,000.00	0.00	0.00	3,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,100.00	0.00	0.00	4,076.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,200.00	0.00	0.00	4,176.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,300.00	0.00	0.00	4,276.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,400.00	0.00	0.00	4,376.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,500.00	0.00	0.00	4,476.25	199.28	-224.98	-199.36	0.00	0.00	0.00

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4,600.00	0.00	0.00	4,576.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,700.00	0.00	0.00	4,676.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,800.00	0.00	0.00	4,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
4,900.00	0.00	0.00	4,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,000.00	0.00	0.00	4,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,100.00	0.00	0.00	5,076.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,200.00	0.00	0.00	5,176.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,300.00	0.00	0.00	5,276.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,400.00	0.00	0.00	5,376.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,500.00	0.00	0.00	5,476.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,600.00	0.00	0.00	5,576.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,700.00	0.00	0.00	5,676.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,800.00	0.00	0.00	5,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
5,900.00	0.00	0.00	5,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,000.00	0.00	0.00	5,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,100.00	0.00	0.00	6,076.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,200.00	0.00	0.00	6,176.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,300.00	0.00	0.00	6,276.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,400.00	0.00	0.00	6,376.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,500.00	0.00	0.00	6,476.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,600.00	0.00	0.00	6,576.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,700.00	0.00	0.00	6,676.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,800.00	0.00	0.00	6,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
6,900.00	0.00	0.00	6,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,000.00	0.00	0.00	6,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,100.00	0.00	0.00	7,076.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,200.00	0.00	0.00	7,176.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,300.00	0.00	0.00	7,276.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,400.00	0.00	0.00	7,376.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,500.00	0.00	0.00	7,476.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,600.00	0.00	0.00	7,576.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,700.00	0.00	0.00	7,676.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,800.00	0.00	0.00	7,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
7,900.00	0.00	0.00	7,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,000.00	0.00	0.00	7,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,100.00	0.00	0.00	8,076.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,200.00	0.00	0.00	8,176.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,300.00	0.00	0.00	8,276.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,400.00	0.00	0.00	8,376.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,500.00	0.00	0.00	8,476.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,600.00	0.00	0.00	8,576.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,700.00	0.00	0.00	8,676.25	199.28	-224.98	-199.36	0.00	0.00	0.00



Pro Directional Survey Report



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Wellbore: OH
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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)
8,800.00	0.00	0.00	8,776.25	199.28	-224.98	-199.36	0.00	0.00	0.00
8,900.00	0.00	0.00	8,876.25	199.28	-224.98	-199.36	0.00	0.00	0.00
9,000.00	0.00	0.00	8,976.25	199.28	-224.98	-199.36	0.00	0.00	0.00
9,052.75	0.00	0.00	9,029.00	199.28	-224.98	-199.36	0.00	0.00	0.00
[WhistleTB#5H]FTP									
9,100.00	4.73	179.98	9,076.20	197.33	-224.98	-197.41	10.00	10.00	0.00
9,150.00	9.73	179.98	9,125.79	191.05	-224.98	-191.12	10.00	10.00	0.00
9,200.00	14.73	179.98	9,174.64	180.46	-224.97	-180.54	10.00	10.00	0.00
9,250.00	19.73	179.98	9,222.38	165.66	-224.97	-165.74	10.00	10.00	0.00
9,300.00	24.73	179.98	9,268.65	146.75	-224.96	-146.83	10.00	10.00	0.00
9,350.00	29.73	179.98	9,313.10	123.89	-224.95	-123.97	10.00	10.00	0.00
9,400.00	34.73	179.98	9,355.38	97.23	-224.94	-97.31	10.00	10.00	0.00
9,450.00	39.73	179.98	9,395.18	66.99	-224.93	-67.07	10.00	10.00	0.00
9,500.00	44.73	179.98	9,432.19	33.40	-224.92	-33.48	10.00	10.00	0.00
9,550.00	49.73	179.98	9,466.14	-3.29	-224.91	3.21	10.00	10.00	0.00
9,600.00	54.73	179.98	9,496.76	-42.80	-224.89	42.72	10.00	10.00	0.00
9,650.00	59.73	179.98	9,523.82	-84.82	-224.88	84.74	10.00	10.00	0.00
9,700.00	64.73	179.98	9,547.11	-129.05	-224.86	128.97	10.00	10.00	0.00
9,750.00	69.73	179.98	9,566.46	-175.13	-224.85	175.06	10.00	10.00	0.00
9,800.00	74.73	179.98	9,581.72	-222.73	-224.83	222.65	10.00	10.00	0.00
9,850.00	79.73	179.98	9,592.77	-271.48	-224.81	271.40	10.00	10.00	0.00
9,900.00	84.73	179.98	9,599.53	-321.00	-224.79	320.93	10.00	10.00	0.00
9,952.74	90.00	179.98	9,601.96	-373.67	-224.77	373.59	10.00	10.00	0.00
10,000.00	90.00	179.98	9,601.96	-420.93	-224.76	420.85	0.00	0.00	0.00
10,100.00	90.00	179.98	9,601.96	-520.93	-224.72	520.85	0.00	0.00	0.00
10,200.00	90.00	179.98	9,601.96	-620.93	-224.69	620.85	0.00	0.00	0.00
10,300.00	90.00	179.98	9,601.96	-720.93	-224.65	720.85	0.00	0.00	0.00
10,400.00	90.00	179.98	9,601.96	-820.93	-224.61	820.85	0.00	0.00	0.00
10,500.00	90.00	179.98	9,601.96	-920.93	-224.58	920.85	0.00	0.00	0.00
10,600.00	90.00	179.98	9,601.96	-1,020.93	-224.54	1,020.85	0.00	0.00	0.00
10,700.00	90.00	179.98	9,601.96	-1,120.93	-224.51	1,120.85	0.00	0.00	0.00
10,800.00	90.00	179.98	9,601.97	-1,220.93	-224.47	1,220.85	0.00	0.00	0.00
10,900.00	90.00	179.98	9,601.97	-1,320.93	-224.43	1,320.85	0.00	0.00	0.00
11,000.00	90.00	179.98	9,601.97	-1,420.93	-224.40	1,420.85	0.00	0.00	0.00
11,100.00	90.00	179.98	9,601.97	-1,520.93	-224.36	1,520.85	0.00	0.00	0.00
11,200.00	90.00	179.98	9,601.97	-1,620.93	-224.33	1,620.85	0.00	0.00	0.00
11,300.00	90.00	179.98	9,601.97	-1,720.93	-224.29	1,720.85	0.00	0.00	0.00
11,400.00	90.00	179.98	9,601.97	-1,820.93	-224.26	1,820.85	0.00	0.00	0.00
11,500.00	90.00	179.98	9,601.97	-1,920.93	-224.22	1,920.85	0.00	0.00	0.00
11,600.00	90.00	179.98	9,601.97	-2,020.93	-224.18	2,020.85	0.00	0.00	0.00
11,700.00	90.00	179.98	9,601.97	-2,120.93	-224.15	2,120.85	0.00	0.00	0.00
11,800.00	90.00	179.98	9,601.98	-2,220.93	-224.11	2,220.85	0.00	0.00	0.00

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11,900.00	90.00	179.98	9,601.98	-2,320.93	-224.08	2,320.85	0.00	0.00	0.00
12,000.00	90.00	179.98	9,601.98	-2,420.93	-224.04	2,420.85	0.00	0.00	0.00
12,100.00	90.00	179.98	9,601.98	-2,520.93	-224.00	2,520.85	0.00	0.00	0.00
12,200.00	90.00	179.98	9,601.98	-2,620.93	-223.97	2,620.85	0.00	0.00	0.00
12,300.00	90.00	179.98	9,601.98	-2,720.93	-223.93	2,720.85	0.00	0.00	0.00
12,400.00	90.00	179.98	9,601.98	-2,820.93	-223.90	2,820.85	0.00	0.00	0.00
12,500.00	90.00	179.98	9,601.98	-2,920.93	-223.86	2,920.85	0.00	0.00	0.00
12,600.00	90.00	179.98	9,601.98	-3,020.93	-223.83	3,020.85	0.00	0.00	0.00
12,700.00	90.00	179.98	9,601.98	-3,120.93	-223.79	3,120.85	0.00	0.00	0.00
12,800.00	90.00	179.98	9,601.98	-3,220.93	-223.75	3,220.85	0.00	0.00	0.00
12,900.00	90.00	179.98	9,601.99	-3,320.93	-223.72	3,320.85	0.00	0.00	0.00
13,000.00	90.00	179.98	9,601.99	-3,420.93	-223.68	3,420.85	0.00	0.00	0.00
13,100.00	90.00	179.98	9,601.99	-3,520.93	-223.65	3,520.85	0.00	0.00	0.00
13,200.00	90.00	179.98	9,601.99	-3,620.93	-223.61	3,620.85	0.00	0.00	0.00
13,300.00	90.00	179.98	9,601.99	-3,720.93	-223.57	3,720.85	0.00	0.00	0.00
13,400.00	90.00	179.98	9,601.99	-3,820.93	-223.54	3,820.85	0.00	0.00	0.00
13,500.00	90.00	179.98	9,601.99	-3,920.93	-223.50	3,920.85	0.00	0.00	0.00
13,600.00	90.00	179.98	9,601.99	-4,020.93	-223.47	4,020.85	0.00	0.00	0.00
13,700.00	90.00	179.98	9,601.99	-4,120.93	-223.43	4,120.85	0.00	0.00	0.00
13,800.00	90.00	179.98	9,601.99	-4,220.93	-223.39	4,220.85	0.00	0.00	0.00
13,900.00	90.00	179.98	9,601.99	-4,320.93	-223.36	4,320.85	0.00	0.00	0.00
14,000.00	90.00	179.98	9,602.00	-4,420.93	-223.32	4,420.85	0.00	0.00	0.00
14,100.00	90.00	179.98	9,602.00	-4,520.93	-223.29	4,520.85	0.00	0.00	0.00
14,200.00	90.00	179.98	9,602.00	-4,620.93	-223.25	4,620.85	0.00	0.00	0.00
14,300.00	90.00	179.98	9,602.00	-4,720.93	-223.22	4,720.85	0.00	0.00	0.00
14,400.00	90.00	179.98	9,602.00	-4,820.93	-223.18	4,820.85	0.00	0.00	0.00
14,482.47	90.00	179.98	9,602.00	-4,903.40	-223.15	4,903.32	0.00	0.00	0.00

[WhistleTB#5H]LTP/BHL

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
[WhistleTB#5H]FTP - plan hits target center - Point	0.00	0.00	9,029.00	199.28	-224.98	424,266.55	592,322.07	32.166074	-104.034977
[WhistleTB#5H]LTP/BHL - plan hits target center - Point	0.00	0.00	9,602.00	-4,903.40	-223.15	419,163.87	592,323.90	32.152047	-104.035017

Checked By: _____ Approved By: _____ Date: _____



Marathon Oil
Eddy County, NM
Whistle Pig Fee 25-28-1
TB #5H
Prelim Plan A
GL: 2912' + KB: 27' (Precision582)

US Data Plane 1827 (E and solution)
NAD 1827 (NADCON CONUS)
Clarke 1866
New Mexico East 3001
Mean Sea Level

RKB Elevation: Well @ 2939.00ft (GL: 2912' + KB: 27' (Precision582))

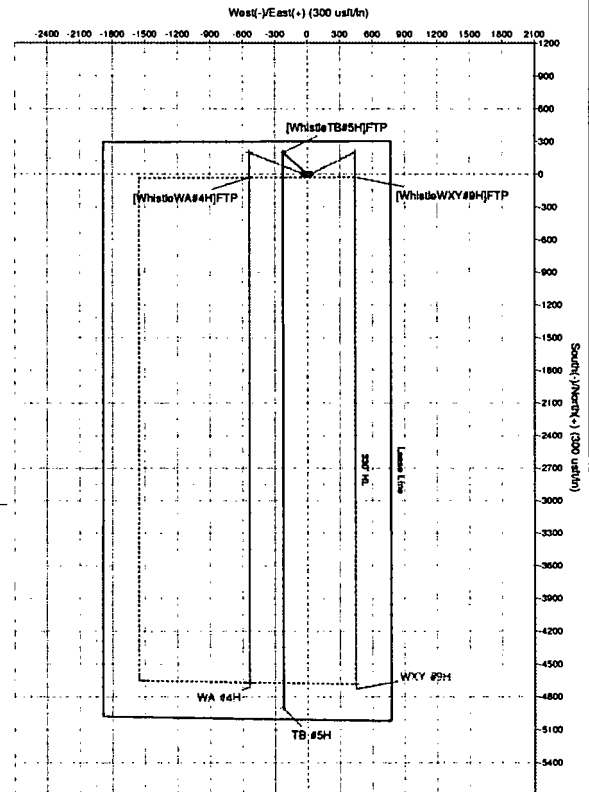
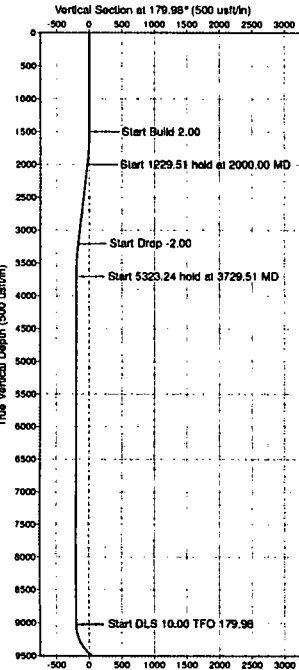
+N/-S	+E/-W	North	Easting	Latitude	Longitude	Spot
0.00	0.00	424067.27	692547.05	32.165524	-104.034251	

SECTION DETAILS

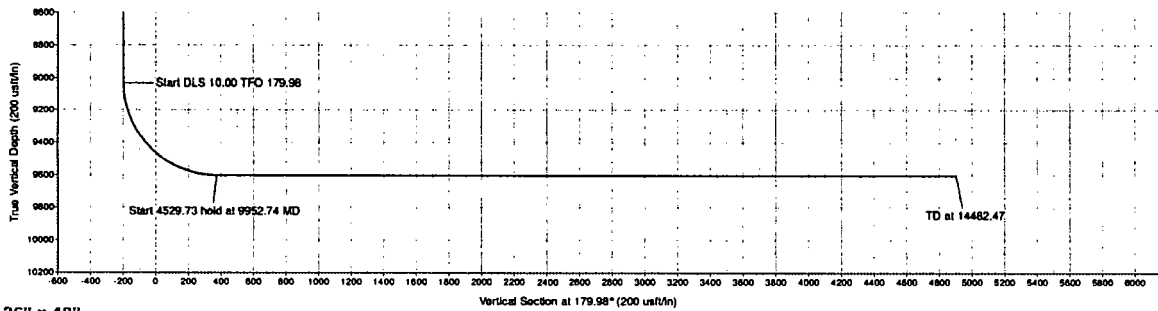
Sec	MD	Inc	Arl	TVD	+N/-S	+E/-W	Diag	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00
3	2000.00	10.00	311.53	1997.47	28.86	-32.58	2.00	-28.87
4	3229.51	10.00	311.53	3208.29	170.42	-192.40	0.00	-170.49
5	3729.51	0.00	0.00	3705.76	199.28	-224.98	2.00	-199.36
6	9052.75	0.00	0.00	9029.00	199.28	-224.98	0.00	-199.36
7	9952.74	90.00	179.98	9801.96	-373.67	-224.77	10.00	373.59
8	14482.47	90.00	179.98	9802.00	-4903.40	-223.15	0.00	4903.32

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	North	Easting
[WhistleTB#5H]FTP	9029.00	199.28	-224.98	424260.55	592322.07
[WhistleTB#5H]LTP/BHL	9802.00	-4903.40	-223.15	418163.87	592323.90



Target Line: 9602' TVD @ 0° VS: 90° INC



Azimuths to Grid North
True North: 0.18°
Magnetic North: 8.94°
Magnetic Field
Strength: 7.98 Gauss
Dir Angle: 58.92°
Date: 8/2/2018
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 8.94°
Declination (M to T): 7.10° East

36" x 48"