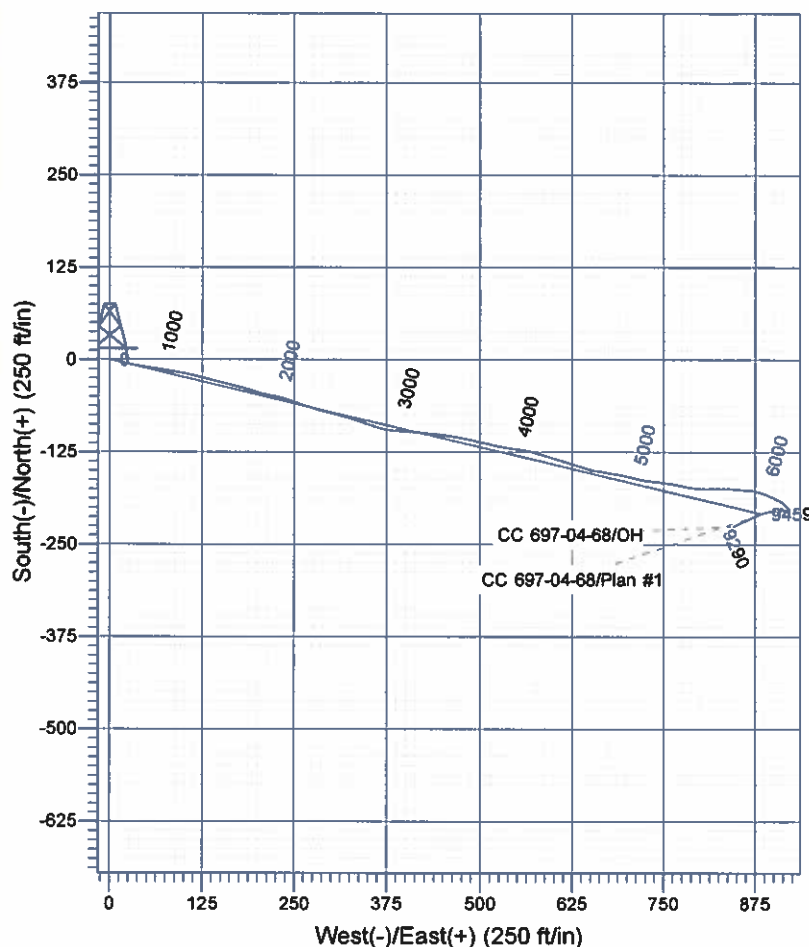
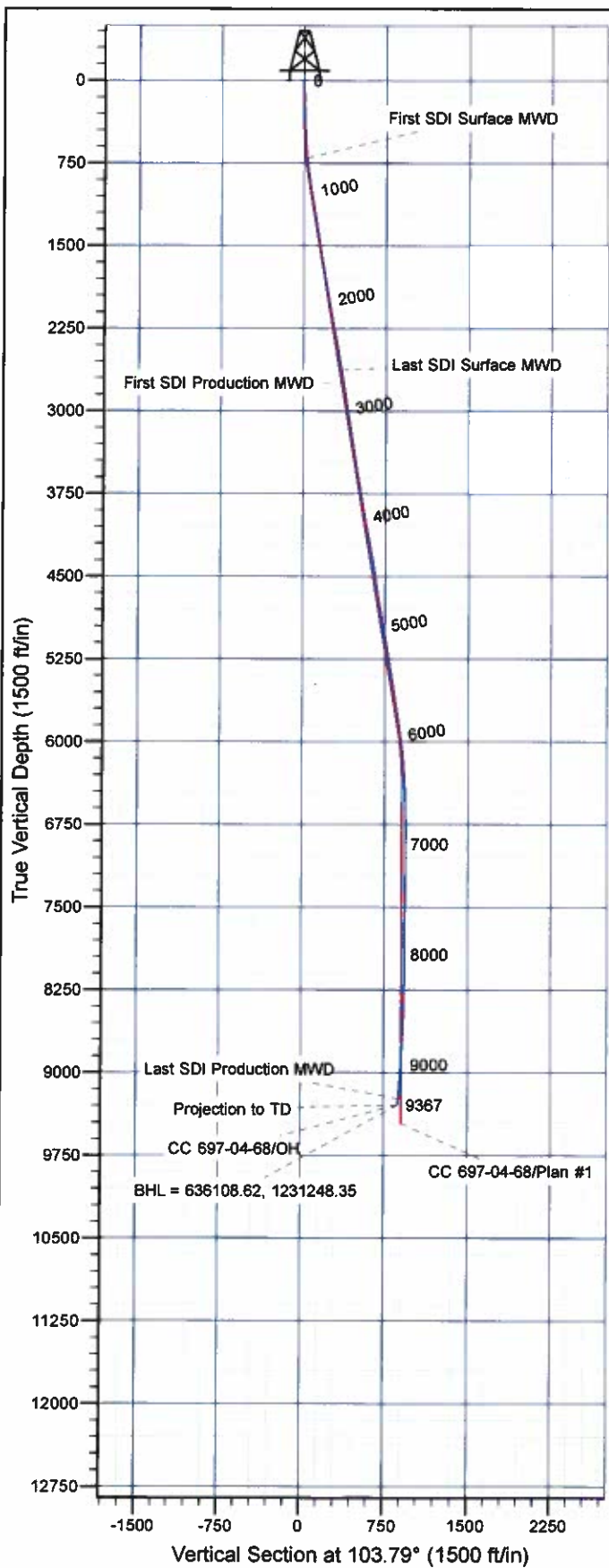




# Scientific Drilling

Company: OXY USA RMAT  
 Project: Garfield County, CO NAD27  
 Site: Cascade Creek 697-04D Pad  
 Well: CC 697-04-68  
 Wellbore: OH  
 Design: OH



## Well Details: CC 697-04-68

+N/-S	+E/-W	TVD Reference: GL 8629' & RKB 30' @ 8659.00ft (H&P)	North	East	Latitude	Longitude	Slot
0.00	0.00	636359.20	1230409.99	39° 32' 55.985 N	108° 13' 46.179 W	F	

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-04-68 - Slot F, True North  
 Vertical (TVD) Reference: GL 8629' & RKB 30' @ 8659.00ft (H&P)  
 Section (VS) Reference: Slot - F(0.00N, 0.00E)  
 Measured Depth Reference: GL 8629' & RKB 30' @ 8659.00ft (H&P)  
 Calculation Method: Minimum Curvature

## PROJECT DETAILS: Garfield County, CO NAD27

Geodetic System: US State Plane 1927 (Exact solution)  
 Datum: NAD 1927 (NADCON CONUS)  
 Ellipsoid: Clarke 1866  
 Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: OH

14:18, May 08 2012  
 Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-04D Pad  
CC 697-04-68 - Slot F**

**OH**

**Design: OH**

## **Standard Survey Report**

**08 May, 2012**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-68 - Slot F
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-68	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

<b>Project</b>	Garfield County, CO NAD27		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado Central 502		

Site		Cascade Creek 697-04D Pad			
Site Position:		Northing:	635,530.62 usft	Latitude:	39° 32' 47.760 N
From:	Map	Easting:	1,230,276.10 usft	Longitude:	108° 13' 47.570 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-04-68 - Slot F					
Well Position	+N/-S	0.00 ft	Northing:	636,359.20 usft	Latitude:	39° 32' 55.985 N
	+E/-W	0.00 ft	Easting:	1,230,409.99 usft	Longitude:	108° 13' 46.179 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,629.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2005-10	03/24/11	10.47	65.76	52,282

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	103.79	

<b>Survey Program</b>	<b>Date</b>	05/08/12			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
703.00	2,653.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard   SCWSA	
2,775.00	9,367.00	Survey #2 - Production MWD (OH)	MWD-SDI	MWD - Standard   SCWSA	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
703.00	4.55	103.38	702.26	-6.46	27.14	27.90	0.65	0.65	0.00
<b>First SDI Surface MWD</b>									
792.00	7.39	99.75	790.77	-8.24	36.22	37.14	3.22	3.19	-4.08
882.00	8.97	98.08	879.85	-10.21	48.87	49.90	1.78	1.78	-1.86
973.00	9.23	99.40	969.71	-12.40	63.09	64.23	0.37	0.29	1.45
1,067.00	9.58	96.41	1,062.44	-14.50	78.31	79.51	0.64	0.37	-3.18
1,162.00	9.32	103.27	1,156.16	-17.15	93.65	95.04	1.22	-0.27	7.22
1,257.00	9.58	100.37	1,249.87	-20.34	108.91	110.62	0.57	0.27	-3.05
1,352.00	8.97	106.26	1,343.63	-23.84	123.80	125.91	1.19	-0.64	6.20

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-68 - Slot F
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-68	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
1,446.00	8.71	103.18	1,436.51	-27.51	137.76	140.35	0.57	-0.28	-3.28
1,541.00	8.79	104.68	1,530.41	-30.99	151.79	154.80	0.25	0.08	1.58
1,636.00	9.94	102.92	1,624.14	-34.66	166.80	170.26	1.25	1.21	-1.85
1,730.00	9.41	106.87	1,716.80	-38.71	182.06	186.04	0.90	-0.56	4.20
1,825.00	10.11	107.49	1,810.43	-43.47	197.45	202.12	0.75	0.74	0.65
1,920.00	9.67	100.11	1,904.02	-47.37	213.26	218.40	1.41	-0.46	-7.77
2,015.00	8.79	102.13	1,997.79	-50.30	228.21	233.62	0.99	-0.93	2.13
2,109.00	10.02	110.13	2,090.53	-54.62	242.91	248.93	1.91	1.31	8.51
2,204.00	11.08	109.33	2,183.92	-60.49	259.28	266.23	1.13	1.12	-0.84
2,299.00	11.26	106.61	2,277.12	-66.16	276.79	284.58	0.59	0.19	-2.86
2,393.00	10.38	103.27	2,369.45	-70.73	293.82	302.21	1.15	-0.94	-3.55
2,488.00	9.76	104.94	2,462.99	-74.77	309.93	318.82	0.72	-0.65	1.76
2,583.00	9.76	106.96	2,556.81	-79.20	325.42	334.91	0.36	0.00	2.13
2,653.00	9.15	106.96	2,625.66	-82.55	336.41	346.39	0.87	-0.87	0.00
<b>Last SDI Surface MWD</b>									
2,775.00	9.67	111.23	2,746.02	-89.09	355.24	366.24	0.71	0.43	3.50
<b>First SDI Production MWD</b>									
2,870.00	9.15	103.41	2,839.74	-93.73	370.03	381.71	1.45	-0.55	-8.23
2,965.00	9.76	94.62	2,933.46	-96.13	385.40	397.21	1.65	0.64	-9.25
3,060.00	9.06	91.98	3,027.18	-97.04	400.91	412.48	0.87	-0.74	-2.78
3,154.00	8.71	96.29	3,120.05	-98.07	415.38	426.78	0.80	-0.37	4.59
3,249.00	8.53	97.61	3,213.98	-99.80	429.51	440.92	0.28	-0.19	1.39
3,344.00	7.56	94.53	3,308.04	-101.22	442.72	454.09	1.12	-1.02	-3.24
3,438.00	8.53	100.33	3,401.12	-102.96	455.75	467.15	1.34	1.03	6.17
3,533.00	9.67	99.28	3,494.92	-105.51	470.55	482.14	1.21	1.20	-1.11
3,628.00	11.08	102.26	3,588.37	-108.74	487.35	499.22	1.59	1.48	3.14
3,722.00	10.46	102.70	3,680.71	-112.53	504.50	516.78	0.67	-0.66	0.47
3,817.00	8.62	103.49	3,774.39	-116.09	519.84	532.52	1.94	-1.94	0.83
3,912.00	9.76	99.63	3,868.17	-119.09	534.70	547.68	1.36	1.20	-4.06
4,007.00	9.06	97.43	3,961.89	-121.41	550.05	563.14	0.83	-0.74	-2.32
4,101.00	9.70	99.85	4,054.64	-123.72	565.20	578.40	0.80	0.68	2.57
4,196.00	11.34	108.86	4,148.04	-128.11	581.92	595.69	2.44	1.73	9.48
4,291.00	11.26	106.83	4,241.20	-133.81	599.64	614.25	0.43	-0.08	-2.14
4,385.00	10.20	107.36	4,333.56	-138.96	616.37	631.72	1.13	-1.13	0.56
4,480.00	9.23	105.34	4,427.19	-143.48	631.74	647.74	1.08	-1.02	-2.13
4,575.00	7.65	109.82	4,521.16	-147.64	645.04	661.64	1.80	-1.66	4.72
4,669.00	8.53	97.43	4,614.23	-150.66	657.84	674.79	2.07	0.94	-13.18
4,764.00	9.94	100.68	4,708.00	-153.09	672.89	689.98	1.58	1.48	3.42
4,859.00	9.23	98.40	4,801.67	-155.73	688.48	705.76	0.85	-0.75	-2.40
4,953.00	10.55	103.58	4,894.28	-158.85	704.30	721.87	1.69	1.40	5.51
5,048.00	8.79	103.32	4,987.92	-162.56	719.82	737.82	1.85	-1.85	-0.27
5,143.00	9.15	94.09	5,081.77	-164.77	734.42	752.53	1.56	0.38	-9.72
5,238.00	10.46	98.13	5,175.38	-166.53	750.49	768.56	1.56	1.38	4.25

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-68 - Slot F
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RKB 30' @ 8659 00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RKB 30' @ 8659 00ft (H&P)
<b>Well:</b>	CC 697-04-68	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
5,332.00	9.32	99.80	5,267.98	-169.04	766.44	784.64	1.25	-1.21	1.78
5,427.00	8.35	102.35	5,361.85	-171.82	780.78	799.21	1.10	-1.02	2.68
5,521.00	9.50	96.02	5,454.71	-174.09	795.14	813.72	1.61	1.22	-6.73
5,616.00	8.79	88.38	5,548.51	-174.71	810.19	828.49	1.48	-0.75	-8.04
5,711.00	8.09	88.38	5,642.48	-174.32	824.13	841.93	0.74	-0.74	0.00
5,806.00	9.76	92.68	5,736.33	-174.50	838.86	856.28	1.89	1.76	4.53
5,900.00	9.06	95.06	5,829.06	-175.53	854.19	871.41	0.85	-0.74	2.53
5,995.00	8.44	96.37	5,922.96	-176.96	868.57	885.72	0.69	-0.65	1.38
6,089.00	7.65	106.92	6,016.04	-179.55	881.41	898.81	1.78	-0.84	11.22
6,184.00	5.45	114.39	6,110.41	-183.25	891.57	909.56	2.48	-2.32	7.86
6,278.00	4.84	113.34	6,204.03	-186.67	899.28	917.85	0.66	-0.65	-1.12
6,373.00	3.96	118.70	6,298.75	-189.83	905.84	924.98	1.02	-0.93	5.64
6,467.00	2.81	122.74	6,392.59	-192.64	910.62	930.29	1.25	-1.22	4.30
6,562.00	2.46	138.91	6,487.49	-195.43	913.92	934.16	0.86	-0.37	17.02
6,657.00	2.02	129.07	6,582.42	-198.02	916.56	937.34	0.61	-0.46	-10.36
6,751.00	1.49	145.59	6,676.37	-200.08	918.54	939.75	0.77	-0.56	17.57
6,846.00	1.23	180.31	6,771.35	-202.11	919.23	940.91	0.89	-0.27	36.55
6,940.00	1.32	189.28	6,865.32	-204.19	919.05	941.23	0.23	0.10	9.54
7,035.00	0.35	252.64	6,960.31	-205.36	918.60	941.07	1.27	-1.02	66.69
7,129.00	0.62	275.41	7,054.31	-205.40	917.82	940.32	0.35	0.29	24.22
7,223.00	1.32	248.16	7,148.30	-205.75	916.30	938.94	0.87	0.74	-28.99
7,318.00	0.70	315.05	7,243.28	-205.75	914.88	937.55	1.29	-0.65	70.41
7,413.00	1.14	348.88	7,338.27	-204.41	914.29	936.66	0.72	0.46	35.61
7,507.00	0.97	285.95	7,432.26	-203.27	913.34	935.47	1.18	-0.18	-66.95
7,601.00	1.14	260.64	7,526.24	-203.21	911.65	933.81	0.52	0.18	-26.93
7,696.00	0.62	292.02	7,621.23	-203.17	910.24	932.44	0.73	-0.55	33.03
7,791.00	1.06	3.12	7,716.22	-202.10	909.82	931.77	1.10	0.46	74.84
7,885.00	0.62	307.93	7,810.21	-200.92	909.46	931.14	0.93	-0.47	-58.71
7,980.00	0.44	86.71	7,905.21	-200.58	909.42	931.02	1.05	-0.19	146.08
8,075.00	0.79	132.15	8,000.21	-201.00	910.27	931.94	0.60	0.37	47.83
8,170.00	1.14	204.22	8,095.20	-202.30	910.37	932.35	1.23	0.37	75.86
8,264.00	1.76	219.51	8,189.17	-204.27	909.07	931.55	0.77	0.66	16.27
8,359.00	1.14	251.59	8,284.14	-205.69	907.24	930.12	1.05	-0.65	33.77
8,454.00	1.41	300.02	8,379.12	-205.40	905.33	928.20	1.13	0.28	50.98
8,504.43	1.62	287.92	8,429.53	-204.87	904.12	926.89	0.76	0.41	-24.00
<b>CC 697-04-68 Target</b>									
8,549.00	1.85	279.80	8,474.08	-204.56	902.81	925.55	0.76	0.52	-18.22
8,643.00	2.55	265.83	8,568.01	-204.45	899.23	922.04	0.93	0.74	-14.86
8,738.00	2.64	260.99	8,662.91	-204.95	894.96	918.02	0.25	0.09	-5.09
8,833.00	3.43	253.00	8,757.78	-206.12	890.08	913.56	0.94	0.83	-8.41
8,927.00	4.66	251.50	8,851.54	-208.16	883.77	907.91	1.31	1.31	-1.60
9,022.00	5.36	248.51	8,946.18	-211.01	875.98	901.03	0.79	0.74	-3.15
9,117.00	5.36	244.65	9,040.76	-214.53	867.84	893.97	0.38	0.00	-4.06
9,211.00	5.54	241.92	9,134.34	-218.55	859.87	887.18	0.34	0.19	-2.90



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-68 - Slot F
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RKB 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-68	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
9,311.00	5.98	246.14	9,233.83	-222.93	850.85	879.46	0.61	0.44	4.22
<b>Last SDI Production MWD</b>									
9,367.00	5.98	246.14	9,289.53	-225.29	845.51	874.84	0.00	0.00	0.00
<b>Projection to TD - BHL = 636108.62, 1231248.35</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
703.00	702.26	-6.46	27.14	First SDI Surface MWD
2,653.00	2,625.66	-82.55	336.41	Last SDI Surface MWD
2,775.00	2,746.02	-89.09	355.24	First SDI Production MWD
9,311.00	9,233.83	-222.93	850.85	Last SDI Production MWD
9,367.00	9,289.53	-225.29	845.51	Projection to TD
9,367.00	9,289.53	-225.29	845.51	BHL = 636108.62, 1231248.35

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_